COUNTY GOVERNMENT OF BOMET

PROPOSED CONSTRUCTION OF DR. JOYCE LABOSO MOTHER AND CHILD

FOR

THE DEPARTMENT OF MEDICAL SERVICES AND PUBLIC HEALTH

REVISED TENDER DOCUMENT

TENDER NO: CGB/MS & PH/KDSP/001/2021/2022/2023

NEGOTIATION NO: 939968

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REPUBLIC OF KENYA

COUNTY GOVERNMENT OF BOMET

TENDER DOCUMENT

1. **NAME AND CONTACT AND DRESSES OF PROCURING ENTITY.**

Name; CHIEF OFFICER, DEPARTMENT OF MEDICAL SERVICES AND PUBLIC HEALTH, COUNTY GOVERNMENT OF BOMET.

Address; P.O BOX 19- 20400 BOMET

Email address

……

2. **Invitation to Tender (ITT) No. CGB/MS & PH/KDSP/001/2021/2022/2023**

TENDER NAME; PROPOSED CONSTRUCTION OF MOTHER AND CHILD WELLNESS CENTRE

INVITATION TO TENDER

PROCURING ENTITY: CHIEF OFFICER, DEPARTMENT OF MEDICAL SERVICES AND PUBLIC HEALTH-PUBLIC HEALTH SECTION, COUNTY GOVERNMENT OF BOMET.

CONTRACT NAME AND DESCRIPTION: PROPOSED CONSTRUCTION OF MOTHER AND CHILD WELNESS CENTRE

The **Chief Officer, Department of Public Health - County Government of Bomet** invites sealed tenders for the construction of;
PROPOSED CONSTRUCTION OF MOTHER AND CHILD WELNESS CENTRE.

Tendering will be conducted under open National competitive using a standardized tender document. Tendering is open to all qualified and interested Tenderers.

*Interested Building contractors registered with **National Construction Authority (NCA) in Category "3" and above** and meeting other tendering requirements are eligible to tender and must submit as mandatory requirement the following documents;*

1. Tender security/ Bid bond of Kshs 5,400,000 inform of Bank guarantee as per the form and format and should be valid for 120 days.
2. Certified Registration/Incorporation certificate.
3. Certified CR 12 to show directorship of the company.
4. Certified Valid Tax compliance certificate
5. Certified certificates of Registration **& Practicing licenses** with NCA for domestic sub-contractor for electrical and Mechanical Engineering Services-NCA 4 and a
6. Certified valid practicing NCA license for civil **(Road)** works**- NCA 5 for Main Contractor**.
7. Duly filled and Certified form of specific construction experience (**1** No. completed Hospital project **and 2 Nr Similar Projects** of at least Kshs.100 Million **Each** in the last five years).
8. Valid Single Business Permit/Trade license f**or the contractor's Main office.**
9. Duly filled and signed form of Tender.
10. Duly filled and signed appendix to form of Tender
11. Properly filled, signed and stamped mandatory Confidential Business Questionnaire.
12. Properly filled, signed and stamped Bill of Quantities.
13. Duly filled confidential business questionnaire (attach CR 12 to confirm Directors)
14. Duly filled declaration form.
15. Presentation of a well bound and properly paginated tender document (including the attachments).
16. Compliance with submission both **on-line** through the IFMIS system and manually where 2No. hard copies must be submitted.
17. Details of Electrical and Mechanical services Sub-Contractors to show their technical capability

Qualified and interested tenderers may obtain further information and inspect the Tender Documents during office hours *[0800 to 1700 hours]* at the address given below tender documents shall be obtained electronically from the Website(s). A complete set of Tender documents may be viewed and downloaded for free from the website www.bomet.go.ke. or suppliers' portal vide the negotiation number attached for the tender. Tenderers who download the tender document must forward their particulars immediately to skirui2012@gmail.com
to facilitate any further clarification or addendum

DR. JOYCE LABOSO MEMORIAL MOTHER & CHILD WELLNESS CENTRE.

Tenders shall be quoted be in **Kenya**Shillings and shall include all taxes. Tenders shall remain valid for **(120)** days from the dat All Tenders must be accompanied by a "tender Security" of ***Kshs 5,400,000 Million*** in the currency of Kenya shillings inform of Bank guarantee. The Tenderer shall chronologically serialize all pages of the tender documents submitted. Completed tenders must be delivered to the address below on or before *on or before* ***MONDAY 28TH*** FEBRUARY ***2022 AT 11:00 Am.]. Electronically through IFMIS portal and 2 No.Hard Copy to be delivered in the tender Box Situated in the county Procurement Office.*** Tenders will be opened immediately after the deadline date and time specified above or any dead line date and time specified later. Tenders will be publicly opened in the presence of the Tenderers' designated representatives who choose to attend at the address below. Late tenders will be rejected. The addresses referred to above are:

A. <u>Address for obtaining further information and for purchasing tender documents</u>

1) **County Government of Bomet**
2) **Procurement Office located next to the County Treasury)**
3) **P.o Box 19-20400 Bomet**

B. Address for Submission of Tenders.

1) **County Government of Bomet**
2) **Procurement Office located next to the County Treasury)**
3) **P.o Box 19-20400 Bomet**
4) **Samuel Kirui-0724001209-skirui2012@gmail.com**

C. Address for Opening of Tenders.

1) **County Government of Bomet**
2) **Procurement Office located next to the County Treasury)**

[Authorized Official (name, designation, Signature and date)]

Name_____(*Official of the Procuring Entity issuing the invitation)*

Designation_____ Signature_____ Date _____

PART 1 - TENDERING PROCEDURES

SECTION I: INSTRUCTIONS TO TENDERERS

A General Provisions

1. Scope of Tender

1.1 The Procuring Entity as defined in the Appendix to Conditions of Contract invites tenders for Works Contract as described in the tender documents. The name, identification, and number of lots (contracts) of this Tender Document are **specified in the TDS.**

2. Fraud and Corruption

2.1 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.

2.2 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.

2.3 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.

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 being tendered for. The Procuring Entity shall indicate in the **TDS** firms (if any) that provided consulting services for the contract being tendered for. The Procuring Entity shall check whether the owners or controllers of the Tenderer are same as those that provided consulting services. The Procuring Entity shall, upon request, make available to any tenderer information that would give such firm unfair competitive advantage over competing firms.

3. Eligible Tenderers

3.1 A Tenderer may be a firm that is a private entity, a state-owned enterprise or institution subject to ITT 3.7 or any combination of such entities in the form of a joint venture (JV) under an existing agreement or with the intent to enter into such an agreement supported by a letter of intent. Public employees and their close relatives *(spouses, children, brothers, sisters and uncles and aunts)* are not eligible to participate in the tender. 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. The maximum number of JV members shall be specified in the **TDS.**

3.2 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.

3.3 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; or

b) Receives or has received any direct or indirect subsidy from another tenderer; or

c) Has the same legal representative as another tenderer; or

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; or

e) Any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the works that are the subject of the tender; or

f) any of its affiliates has been hired (or is proposed to be hired) by the Procuring Entity as Engineer for the Contract implementation; or

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 or

h) Has a close business or family relationship with a professional staff of the Procuring Entity who:

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) would be involved in the implementation or supervision of such Contract unless the conflict stemming from such relationship has been resolved in a manner acceptable to the Procuring Entity throughout the tendering process and execution of the Contract.

3.4 A tenderer shall not be involved in corrupt, coercive, obstructive, collusive or fraudulent practice. A tenderer that is proven to have been involved any of these practices shall be automatically disqualified.

3.5 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. A firm that is not a tenderer or a JV member may participate as a subcontractor in more than one tender. 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.

3.6 A Tenderer may have the nationality of any country, subject to the restrictions pursuant to ITT 4.8.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 subcontractors or sub-consultants for any part of the Contract including related Services.

3.7 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.

3.8 Tenderers that are state-owned enterprises or institutions may be eligible to compete and be awarded a Contract(s) only if they are accredited by PPRA to be (i) a legal public entity of the state 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.

3.9 A Firms and individuals may be ineligible if their countries of origin (a) as a matter of law or official regulations, Kenya prohibits commercial relations with that country, or (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, subcontracts and labor) from national 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 in for this purpose is be provided in *"SECTION III - EVALUATION AND QUALIFICATION CRITERIA, Item 9"*.

3.11 Pursuant to the eligibility requirements of ITT 4.10, a tender is considered a foreign tenderer, if the tenderer is not registered in Kenya or if the tenderer is registered in Kenya and has less than 51 percent ownership by Kenyan

Citizens. JVs are considered as foreign tenderers if the individual member firms are not registered in Kenya or if are registered in Kenya and have less than 51 percent ownership by Kenyan citizens. 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

3.14 A Kenyan tenderer shall provide evidence of having fulfilled his/her tax obligations by producing a valid tax clearance certificate or tax exemption certificate issued by the Kenya Revenue Authority.

4. Eligible Goods, Equipment, and Services

4.1 Goods, equipment and services to be supplied under the Contract may have their origin in any country that is not eligible 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.

4.2 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.

5. Tenderer's Responsibilities

5.1 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.

5.2 The tenderer, at the tenderer's own responsibility and risk, is encouraged to visit and examine the Site of the Works and its surroundings, and obtain all information that may be necessary for preparing the tender and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the tenderer's own expense.

5.3 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 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 inspection.

5.4 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

6. Sections of Tender Document

6.1 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 8.

PART 1 Tendering Procedures

i) Section I - Instructions to Tenderers (ITT)
ii) Section II - Tender Data Sheet (TDS)
iii) Section III - Evaluation and Qualification Criteria
iv) Section IV - Tendering Forms

PART 2 Works Requirements

i) Section V - Drawings
ii) Section VI - Specifications
iii) Section VII - Bills of Quantities

PART 3 Conditions of Contract and Contract Forms

i) Section VIII - General Conditions of Contract (GCC)
ii) Section IX - Special Conditions of Contract (SC)
iii) Section X - Contract Forms

6.2 The Invitation to Tender Document (ITT) issued by the Procuring Entity is not part of the Contract documents.

6.3 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 the pre-Tender meeting (if any), or Addenda to the Tender document in accordance with ITT 8. In case of any contradiction, documents obtained directly from the Procuring Entity shall prevail.

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.

7. Site Visit

7.1 The Tenderer, at the Tenderer's own responsibility and risk, is encouraged to visit and examine and inspect the Site of the Required Services and its surroundings and obtain all information that may be necessary for preparing the Tender and entering into a contract for the Services. The costs of visiting the Site shall be at the Tenderer's own expense.

8. Pre-Tender Meeting

8.1 The Procuring Entity shall specify in the **TDS** if a pre-tender meeting will be held, when and where. The Procuring Entity shall also specify in the **TDS** if a pre-arranged pretender site visit will be held and when. The Tenderer's designated representative is invited to attend a pre-arranged pretender visit of the site of the works. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

8.2 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.

8.3 Minutes of the pre-Tender meeting and the pre-arranged pretender site visit of the site of the works, 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 in accordance with ITT 6.3. Minutes shall not identify the source of the questions asked.

8.4 The Procuring Entity shall also promptly publish anonym zed (*no names*) Minutes of the pre-Tender meeting and the pre-arranged pretender visit of the site of the works at the web page identified in the **TDS**. Any modification to the Tender Documents that may become necessary as a result of the pre-tender meeting and the pre-arranged pretender site visit, 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. Nonattendance at the pre-Tender meeting will not be a cause for disqualification of a Tenderer.

9. Clarification and amendments of Tender Documents

9.1 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 and the pre-

arranged pretender visit of the site of the works if provided for in accordance with ITT 8.4. 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 6.3, including a description of the inquiry but without identifying its source. If 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 appropriately following the procedure under ITT 8.4.

10. Amendment of Tendering Document

10.1 At any time prior to the deadline for submission of Tenders, the Procuring Entity may amend the Tendering document by issuing addenda.

10.2 Any addendum issued shall be part of the tendering document and shall be communicated in writing to all who have obtained the tendering document from the Procuring Entity in accordance with ITT 6.3. The Procuring Entity shall also promptly publish the addendum on the Procuring Entity's web page in accordance with ITT 8.4.

10.3 To give prospective Tenderers reasonable time in which to take an addendum into account in preparing their Tenders, the Procuring Entity shall extend, as necessary, the deadline for submission of Tenders, in accordance with ITT 25.2 below**.**

C. Preparation of Tenders

11. Cost of Tendering

11.1 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.

12. Language of Tender

12.1 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.

13. Documents Comprising the Tender

13.1 The Tender shall comprise the following:

a) Form of Tender prepared in accordance with ITT 14;
b) Schedules including priced Bill of Quantities, completed in accordance with ITT 14 and ITT 16;
c) Tender Security or Tender-Securing Declaration, in accordance with ITT 21.1;
d) Alternative Tender, if permissible, in accordance with ITT 15;
e) Authorization: written confirmation authorizing the signatory of the Tender to commit the Tenderer, in accordance with ITT 22.3;
f) Qualifications: documentary evidence in accordance with ITT 19establishing the Tenderer's qualifications to perform the Contract if its Tender is accepted;
g) Conformity: a technical proposal in accordance with ITT 18;
h) Any other document required in the **TDS**.

13.2 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 Agreement. The Tenderer shall chronologically serialize pages of all tender documents submitted.

13.3 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**.**

14. Form of Tender and Schedules

14.1 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.

15. Alternative Tenders

15.1 Unless otherwise specified in the **TDS**, alternative Tenders shall not be considered.

15.2 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.

15.3 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. 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 VII, Works' Requirements.

16. Tender Prices and Discounts

16.1 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.

16.2 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.

16.3 The price to be quoted in the Form of Tender, in accordance with ITT 14.1, shall be the total price of the Tender, including any discounts offered.

16.4 The Tenderer shall quote any discounts and the methodology for their application in the Form of Tender, in accordance with ITT 14.1.

16.5 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.

16.6 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 16.4, provided the Tenders for all lots (contracts) are opened at the same time.

16.7 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.

17. Currencies of Tender and Payment

17.1 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 Tenderer expecting to incur expenditures in other currencies for inputs to the Works supplied from outside Kenya shall device own ways of getting foreign currency to meet those expenditures.

18. Documents Comprising the Technical Proposal

18.1 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, in sufficient detail to demonstrate the adequacy of the Tenderer's proposal to meet the work's requirements and the completion time.

19. Documents Establishing the Eligibility and Qualifications of the Tenderer

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

19.2 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.

19.3 A margin of preference will not be allowed. Preference and reservations will be allowed, individually or in joint ventures. Applying for eligibility for Preference and reservations shall supply all information required to satisfy the criteria for eligibility specified in accordance with ITT 33.1.

19.4 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 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.

19.5 The purpose of the information described in ITT 19.4 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.

19.6 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 6.3. 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.

19.7 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.

19.8 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.

19.9 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 aside,
iii) the tenderer will be referred to the relevant law enforcement authorities for investigation of whether the tenderer or any other persons have committed any criminal offence.

19.10 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 6.7 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.

20. Period of Validity of Tenders

20.1 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 24). A Tender valid for a shorter period shall be rejected by the Procuring Entity as non-responsive.

20.2 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 21.1, 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, except as provided in ITT 20.3.

20.3 If the award is delayed by a period exceeding the number of days to be specified in the **TDS** days beyond the expiry of the initial tender validity period, the Contract price shall be determined as follows**:**

a) in the case of **fixed price** contracts, the Contract price shall be the tender price adjusted by the factor specified in the **TDS**;
b) in the case of **adjustable price** contracts, no adjustment shall be made; or in any case, tender evaluation shall be based on the tender price without taking into consideration the applicable correction from those indicated above.

21. Tender Security

21.1 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**.**

21.2 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:

a) an unconditional Bank Guarantee issued by reputable commercial bank); or
b) an irrevocable letter of credit;
c) a Banker's cheque issued by a reputable commercial bank; or
d) another security specified **in the TDS**,

21.3 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 20.2.

21.4 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.

21.5 If a Tender Security is specified pursuant to ITT 21.1, 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 nonresponsive or a bidder declines to extend tender validity period.

21.6 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**.

21.7 The Tender Security may be forfeited or the Tender-Securing Declaration executed:

e) 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

f) if the successful Tenderer fails to:

i) sign the Contract in accordance with ITT 50; or

ii) furnish a Performance Security and if required in the **TDS**, and any other documents required in the **TDS**.

21.8 Where tender securing declaration is executed, the Procuring Entity shall recommend to the PPRA that PPRA debars the Tenderer from participating in public procurement as provided in the law.

21.9 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.

21.10 A tenderer shall not issue a tender security to guarantee itself.

22. Format and Signing of Tender

22.1 The Tenderer shall prepare one original of the documents comprising the Tender as described in ITT 13 and clearly mark it "ORIGINAL." Alternative Tenders, if permitted in accordance with ITT 15, 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.

22.2 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.

22.3 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 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.

22.4 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 to be legally binding on all the members as evidenced by a power of attorney signed by their legally authorized representatives.

22.5 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

23. Sealing and Marking of Tenders

23.1 Depending on the sizes or quantities or weight of the tender documents, a tenderer may use an envelope, package or container. 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 15, 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.

23.2 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 that are misplaced or opened prematurely will not be accepted.

24. Deadline for Submission of Tenders

24.1 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**.

24.2 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.

25. Late Tenders

25.1 The Procuring Entity shall not consider any Tender that arrives after the deadline for submission of tenders, in accordance with ITT 24. 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.

26. Withdrawal, Substitution, and Modification of Tenders

26.1 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 22.3, (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 22 and ITT 23 (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 24.

26.2 Tenders requested to be withdrawn in accordance with ITT 26.1 shall be returned unopened to the Tenderers.

26.3 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.

27. Tender Opening

27.1 Except in the cases specified in ITT 23 and ITT 26.2, 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 24.1, shall be as specified in the **TDS**.

27.2 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.

27.3 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. 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.

27.4 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.

27.5 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.

27.6 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 Bills of Quantities are to be initialed by the members of the tender opening committee attending the opening. The number of representatives of the Procuring Entity to sign shall be specified in the **TDS**.

27.7 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 25.1).

27.8 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 one was required.
e) number of pages of each tender document submitted.

27.9 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 upon request.

E. Evaluation and Comparison of Tenders

28. Confidentiality

28.1 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 46.

28.2 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.

28.3 Notwithstanding ITT 28.2, 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.**

29. Clarification of Tenders

29.1 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 33.

29.2 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.

30. Deviations, Reservations, and Omissions

30.1 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.

31. Determination of Responsiveness

31.1 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 13.

31.2 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; or

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; or

c) if rectified, would unfairly affect the competitive position of other tenderers presenting substantially responsive tenders.

31.3 The Procuring Entity shall examine the technical aspects of the tender submitted in accordance with ITT 18, to confirm that all requirements of Section VII, Works' Requirements have been met without any material deviation, reservation or omission.

31.4 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.

32. Non-material Non-conformities

32.1 Provided that a tender is substantially responsive, the Procuring Entity may waive any non-conformities in the tender.

32.2 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, to rectify nonmaterial 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.

32.3 Provided that a tender is substantially responsive, the Procuring Entity shall rectify quantifiable nonmaterial 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.**

33. Arithmetical Errors

33.1 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.

33.2 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, and 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

33.3 Tenderers shall be notified of any error detected in their bid during the notification of a ward.

34. Currency provisions

34.1 Tenders will priced be in Kenya Shillings only. Tenderers quoting in currencies other than in Kenya shillings will be determined non-responsive and rejected.

35. Margin of Preference and Reservations

35.1 No margin of preference shall be allowed on contracts for small works.

35.2 Where it is intended to reserve the contract to specific groups under Small and Medium Enterprises, or enterprise of women, youth and/or persons living with disability, 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/firms belonging to those specified groups are the only ones eligible to tender. Otherwise if no so stated, the invitation will be open to all tenderers.

36. Nominated Subcontractors

36.1 Unless otherwise stated in the **TDS**, the Procuring Entity does not intend to execute any specific elements of the Works by subcontractors selected in advance by the Procuring Entity.

36.2 Tenderers may propose subcontracting 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.

36.3 The 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 by the Procuring Entity in the **TDS** as can 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.

37. Evaluation of Tenders

37.1 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 Best Evaluated Tender in accordance with ITT 40.

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

a) price adjustment due to discounts offered in accordance with ITT 16;
b) converting the amount resulting from applying (a) and (b) above, if relevant, to a single currency in accordance with ITT39;
c) price adjustment due to quantifiable nonmaterial non-conformities in accordance with ITT 30.3; and
d) any additional evaluation factors specified **in the TDS** and Section III, Evaluation and Qualification Criteria.

37.3 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.

37.4 In the case of multiple contracts or lots, Tenderers shall be allowed to tender for one or more lots and the methodology to determine the lowest evaluated cost of the lot (contract) combinations, including any discounts offered in the **Form of Tender, is specified in Section III, Evaluation and Qualification Criteria.**

38. Comparison of Tenders

38.1 The Procuring Entity shall compare the evaluated costs of all substantially responsive Tenders established in accordance with ITT 38.2 to determine the Tender that has the lowest evaluated cost.

39. Abnormally Low Tenders

39.1 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.

39.2 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.

39.3 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.

40. Abnormally High Tenders

40.1 An abnormally high 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.

40.2 In case of an abnormally high tender 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.

40.3 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.

41. Unbalanced and/or Front-Loaded Tenders

41.1 If in the Procuring Entity's opinion, the Tender that is evaluated as the lowest evaluated price is seriously unbalanced and/or front loaded, 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.

41.2 After the evaluation of the information and detailed price analyses presented by the Tenderer, the Procuring Entity may as appropriate:

a) accept the Tender; or

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; or

c) agree on a payment mode that eliminates the inherent risk of the Procuring Entity paying too much for undelivered works; or

d) reject the Tender,

42. Qualifications of the Tenderer

42.1 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.

42.2 The determination shall be based upon an examination of the documentary evidence of the Tenderer's qualifications submitted by the Tenderer, pursuant to ITT 19. 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 Subcontractors if permitted in the Tender document), or any other firm(s) different from the Tenderer.

42.3 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.

42.4 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.

42.5 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.

42.6 After evaluation of the price analyses, if 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.

43. Best Evaluated Tender

43.1 Having compared the evaluated prices of Tenders, the Procuring Entity shall determine the Best Evaluated Tender. The Best 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.

44. Procuring Entity's Right to Accept Any Tender, and to Reject Any or All Tenders.

44.1 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 thereby incurring any liability to Tenderers. In case of annulment, all Tenderers shall be notified with reasons and all Tenders submitted and specifically, Tender securities, shall be promptly returned to the Tenderers.

F. Award of Contract

45. Award Criteria

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

46. Notice of Intention to enter into a Contract

46.1 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) instructions on how to request a debriefing and/or submit a complaint during the standstill period;

47. Standstill Period

47.1 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.

47.2 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.**

48. Debriefing by the Procuring Entity

48.1 On receipt of the Procuring Entity's Notification of Intention to Enter into a Contract referred to in ITT 46, 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.

48.2 Debriefings of unsuccessful Tenderers may be done in writing or verbally. The Tenderer shall bear its own costs of attending **such a debriefing meeting.**

49. Letter of Award

49.1 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 within 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.

50. Signing of Contract

50.1 Upon the expiry of the fourteen days of the Notification of Intention to enter into contract and upon the parties meeting their respective statutory requirements, the Procuring Entity shall send the successful Tenderer the Contract Agreement.

50.2 Within fourteen (14) days of receipt of the Contract Agreement, the successful Tenderer shall sign, date, and return it to the Procuring Entity.

50.3 The written contract shall be entered into within the period specified in the notification of award and before expiry of the tender validity period

51. Appointment of Adjudicator

51.1 The Procuring Entity proposes the person named in the **TDS** to be appointed as Adjudicator under the Contract, at the hourly fee specified in the **TDS**, plus reimbursable expenses. If the Tenderer disagrees with this proposal, the Tenderer should so state in his Tender. If, in the Letter of Acceptance, the Procuring Entity does not agree on the appointment of the Adjudicator, the Procuring Entity will request the Appointing Authority designated in the Special Conditions of Contract (SCC) pursuant to Clause 23.1 of the General Conditions of Contract (GCC), to appoint the Adjudicator.

52. Performance Security

52.1 Within **Fourteen (14) days** of the receipt of the Letter of Acceptance 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 40.2 (b), using the Performance Security and other Forms included in Section X, 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.

52.2 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.

52.3 Performance security shall not be required for contracts estimated to cost less than Kenya shillings five million shillings**.**

53. Publication of Procurement Contract

53.1 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 read out at Tender opening.

54. Procurement Related Complaints and Administrative Review

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

54.2 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.

ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
	A. General
ITT 1.1	The name of the contract is; ***Proposed Construction of Mother and Child wellness center.*** The reference number of the Contract is: **CGB/MS & PH/KDSP/001/2021/2022/2023**
ITT 2.3	The Information made available on competing firms is as follows:
ITT 2.4	The firms that provided consulting services for the contract being tendered for are: ***Chief Officer, Department of Public works & Transport- Directorate Of Public works.***
ITT 3.1	Maximum number of members in the Joint Venture (JV) shall be: ***2 (Two).***
B. Contents of Tender Document	
8.1	(A) Pre-Tender conference ***"shall"*** take place at the following date, time and place: **(Bidders are advice to arrange for themselves a pre-tender site visit)**
ITT 8.2	The Tenderer will submit any questions in writing, to reach the Procuring Entity not later than MONDAY 28TH **FEBRUARY 2022 AT 11:00AM**
ITT 8.4	The Procuring Entity's website where Minutes of the pre-Tender meeting and the pre-arranged pretender site visit will be published is www.bomet.go.ke
ITT 9.1	For Clarification of Tender purposes, for obtaining further information and for purchasing tender documents, the Procuring Entity's address is: (1) Name of Procuring Entity –**COUNTY GOVERNMENT OF BOMET** (2) Physical address for hand Courier Delivery to an office or Tender Box (City, Street, Building, Floor Number and Room) –**PROCUREMENT OFFICE LOCATED NEXT TO THE COUNTY TREASURY**. (3) Postal Address –**P. O BOX 19-20400 BOMET** (4) Insert name, telephone number and e-mail address of the officer to be contacted. – **SAMUEL KIRUI –DSCM-0724001209-skirui2012@gmail.com**
C. Preparation of Tenders	
ITP 13.1 (h)	The Tenderer shall submit the following additional documents in its Tender; As specified in the evaluation criteria.
ITT 15.1	Alternative Tenders ***"shall not be"*** considered.
ITT 15.2	Alternative times for completion ***"shall not be"*** permitted.
ITT 15.4	Alternative technical solutions **"shall not be"** permitted for the following parts of the Works:
ITT 16.5	The prices quoted by the Tenderer shall be: ***"fixed"***
ITT 20.1	The Tender validity period shall be **120 (One Hundred & Twenty) Days**
ITT 21.1	*[If a Tender Security shall be required, a Tender-Securing Declaration shall not be required, and vice versa.]* A Tender Security *"shall be"* required.

ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
	A Tender-Securing Declaration ***"shall not be"*** required. If a Tender Security shall be required, the amount and currency of the Tender Security shall be **Kshs 5,400,000**
ITT 21.2 (d)	The other Tender Security shall be; **N/A.**
ITT 21.5	On the Performance Security, other documents required shall be 5% of the contract sum.
ITT 22.1	In addition to the original of the Tender, the number of hard copies are: **2 (Two).**
ITT 22.3	The written confirmation of authorization to sign on behalf of the Tenderer shall consist of: **Power of Attorney.**
D. Submission and Opening of Tenders	
ITT 24.1	(A) For Tender submission purposes only, the Procuring Entity's address is: (1) **COUNTY GOVERNMENT OF BOMET** **(2) P.O BOX 19-20400 BOMET** **(3) PROCUREMENT OFFICE NEXT TO COUNTY TREASURY** **(4) Date and time for submission of Tenders. WEDNESDAY 2ND FEB 2022 At 11:00AM** (5) Tenderers shall **submit** tenders both manually and electronically.
ITT 27.1	The Tender opening shall take place at the time and the address for Opening of Tenders provided below: (1) **COUNTY GOVERNMENT OF BOMET** **(2) P.O BOX 19-20400 BOMET** **(3) PROCUREMENT OFFICE NEXT TO COUNTY TREASURY** **(4) Date and time for submission of Tenders. MONDAY 28TH FEB 2022 AT 11:00AM.**
ITT 27.1	If Tenderers are allowed to submit Tenders electronically, they shall follow the electronic tender submission procedures **specified below [Manual tenders shall be opened on the opening date.** **ifmis.treasury.go.ke**
ITT 27.6	The number of representatives of the Procuring Entity to sign is **As per the tender opening appointment letter.**
E. Evaluation, and Comparison of Tenders	
ITT 32.3	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 Procuring Entity shall use its best estimate.
ITT 35.2	The invitation to tender is extended to the following groups that qualify for Reservations **National Construction registered Contractors (NCA) Category "3" (Building Works) with NCA 5 in Road Works.**
ITT 36.1	At this time, the Procuring Entity *"does not intend"* to execute certain specific parts of the Works by subcontractors selected in advance.

ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 36.2	Contractor's may propose subcontracting: Maximum percentage of subcontracting permitted is: ***10%*** *of the total contract amount.* 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 36.3	*[Indicate N/A if not applicable]* The parts of the Works for which the Procuring Entity permits Tenderers to propose Specialized Subcontractors are designated as follows: • **Electrical Works,** • **Mechanical Works** 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.
ITT 37.2 (d)	Additional requirements apply. These are detailed in the evaluation criteria in Section III, Evaluation and Qualification Criteria.
ITT 51.1	The person named to be appointed as Adjudicator is _____ of _____*(pride tel. no. full postal and email addresses)* at an hourly fee of Shs._____ per day.
ITT 52.2	Other documents required are; • **3 (Three) Audited accounts or financial statements,** • **Schedule of ongoing projects,** • **Schedule of projects completed in the last 3 (Three) years.**
ITT 54.1	The procedures for making a Procurement-related Complaints are detailed in the "Regulations" available from the PPRA Website www.ppra.go.ke or email complaints@ppra.go.ke. 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: **For the attention: *[SAMUEL KIRUI]*** **Title/position: *DSCM]*** **Procuring Entity: *COUNTY GOVERNMENT OF BOMET]*** **Email address*: [SKIRUI2012@GMAIL.COM]*** **In summary, a Procurement-related Complaint may challenge any of the following:** (i) the terms of the Tender Documents; and (ii) the Procuring Entity's decision to award the contract.

SECTION III - EVALUATION AND QUALIFICATION CRITERIA

1. General Provisions

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.

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 should use **the Standard Tender Evaluation Document for Goods and Works** for evaluating Tenders.

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. Preliminary examination for Determination of Responsiveness

The Procuring Entity will start by examining all tenders to ensure they meet in all respects the eligibility criteria and other requirements in the ITT, and that the tender is complete in all aspects in meeting the requirements of "Part 2 – Procuring Entity's Works Requirements", including checking for tenders with unacceptable errors, abnormally low tenders, abnormally high tenders and tenders that are front loaded. 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 irresponsive and will not be considered further.

- **Mandatory requirements**

All bids shall be checked for the following and any bid that does not conform to the any of the mandatory requirements shall be disqualified from further evaluation. **All mandatory documents must be certified by commissioner of Oaths Registered in Kenya.**

1. Tender security/ Bid bond of Kshs 5,400,000 inform of Bank guarantee as per the form and format and should be valid for additional 30 days after the Tender Validity Period.
2. Certified Registration/Incorporation certificate.
3. Certified CR 12 to show directorship of the company.
4. Certified Valid Tax compliance certificate.
5. Certified certificate of Registration with National Construction Authority for both building and civil works - NCA 3 and above.
6. Certified certificate of Registration with NCA for domestic sub-contractor for electrical and Mechanical Engineering Services-NCA 4 and above.
7. Certified valid practicing NCA license for building and civil works.
8. Duly filled and Certified form of specific construction experience (1 No. completed Hospital & 2 Nr simila Projects of Khs.100 Million in the last five years).
9. Valid Single Business Permit/Trade license from the County Government of Bomet.

10. Duly filled and signed form of Tender.
11. Duly filled and signed appendix to form of Tender
12. Properly filled, signed and stamped mandatory Confidential Business Questionnaire.
13. Properly filled, signed and stamped mandatory Bill of Quantities.
14. Duly filled confidential business questionnaire (attach CR 12 to confirm Directors)
15. Duly filled declaration form.
16. Presentation of a well bound and properly paginated tender document (including the attachments).
17. Compliance with submission both online through the IFMIS system and manually where 2No. hard copies must be submitted.
18. Details of sub-contractors to show their technical capability
19. Any other conditions that are provided in the bid document.

- **Technical evaluation**

Technical evaluation shall be carried out and marks on each item distributed as indicated in the table below. The scores will be awarded by individual evaluators and mean obtained accordingly. The pass mark for further evaluation shall be **75%.**

SN	Description	Max points
1	**Financial performance**	**15**
2	**Average construction turnover**	**10**
3	**General and specific construction experience**	**25**
4	**Key personnel (Site staff and HQ staff)**	**20**
5	**Schedules of on-going projects**	**10**
6	**Schedules of contractors Plant & equipment**	**15**
7	**Work Programme**	**5**
TOTAL		**100**

1. Financial Situation				
1.1	Financial Performance	(a) Submission of certified audited balance sheets for the last **three [3] years** and Six months certified bank statement. (b) the current soundness of the applicant's financial position and its prospective long term profitability, demonstrated in the last three financial Years and (c) certified Proof of capacity to have liquid assets, unencumbered real assets, lines of credit and other financial means sufficient to meet the construction cash flow of **Kenya shillings 50,000,000 (Fifty**	(a) Score • 0 – 4 Marks (b) Score • 0 – 6 Marks (c) Score • 5 Marks	
1.2	Average Annual Construction Turnover	(d) Average annual construction turnover of **KShs.Two hundred Million [200 million],** calculated and supported by certified construction payments within the last **three [(3)] years.**	(d) Score • 0 – 10 Marks	

No.	Subject	Requirement	Bidder	Submission Requirements
1.3 Experience				
(a)	General Construction Experience	Experience under construction contracts in the role as a main contractor or subcontractor for at least the **last Five 5** prior to ρ the applications submission deadline	Score • 0 – 2 Marks	
(b)	Specific Construction Experience	Participation as a building contractor, management contractor or subcontractor, in at least five (3) Projects of **1No.**must be Hospital facilities & 2 similar projects ea **KShs.100 Million (One hundred Million shillings only) successfully and** substantially (1) **2No. others** magnitude and complexity	Score • 3 No projects each project - 5Marks. • 2 No projects each - 4Marks.	
1.4 Current Commitments				
(a)	On-going contracts	The total value of outstanding works on the on-going contracts should not exceed the average annual turnover **for the last three years.**	Score • 0 - 10 Marks	

Qualification Criteria		Compliance Requirement		Documentation
No.	Subject	Requirement	Bidder	Submission Requirements
1.5 Site staff (Key Personnel)	**1No.Technical Director**	The site staff shall possessminimum levels of qualifications set below; Qualification = At least Bachelor's degree in Civil Engineering/Building construction (related field)=2 Marks @ Diploma in Civil Engineering/Building construction or related field= 1mark @	Score • 4 marks 2 marks	
	1No.Site Agent	Qualification = At least Bachelor's degree in Civil Engineering/Building construction (related field) =5 Marks. Diploma in Civil Engineering/Building construction or related field= 3marks .	5marks 3 marks	
	5 No.Site foremen	Qualification = At least a Diploma in Civil Engineering/Building construction (related field)=1Mark@ Certificate in Civil Engineering/Building construction or related field= 0.5 mark@	• 5 marks	
1.6	Work programme that matches the Project completion time.		5marks	
1.7 Plant and Equipment				

	Transport andhauling equipment	Atleast 3 No. self-owned tipperlorry (15 tonnes)	Score • 5 Marks	
	Concreting equipment's	Concrete batching plant ready to be deployed to site for 1 year =6 Marks. Self loading concrete mixer ready to be deployed to site for 1 year =3 Marks. Ordinary Concrete mixer ready to be deployed to site for 1 year = 1 Mark	• 6Marks • 3Marks • 1Mark	
	Excavating Equipment	1No.Excavator/Bulldozer self owned= 3Marks. Excavator/Bulldozer leased-1 Mark	• 3 Marks	

The Pass mark for Technical Evaluation will be 75%. Candidates that will have attained those points will have their financial proposals evaluated.

C)Stage Three: Financial Evaluation

a) The bidder with the lowest evaluated financial proposal will be recommended for the award of the contract.
b) In case of discrepancy between unit price and total, the unit price shall prevail.

c) If there is a tie on the lowest quoted price between two firms, the firm with the highest technical points will be recommended for award.

3. **Tender Evaluation (ITT 35) Price evaluation**: in addition to the criteria listed in ITT 35.2 (a) – (c) the following criteria shall apply:

   i) Alternative Completion Times, if permitted under ITT 13.2, will be evaluated as follows: ……

   ii) Alternative Technical Solutions for specified parts of the Works, if permitted under ITT 13.4, will be evaluated as follows:

   iii) Other Criteria; if permitted under ITT 35.2(d): NONE

4. **Multiple Contracts**

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

   OPTION 1

   i) If a tenderer wins only one Lot, the tenderer will be awarded a contract for that Lot, provided the tenderer meets the Eligibility and Qualification Criteria for that Lot.

ii) If a tenderer wins more than one Lot, the tender will be awarded contracts for all won Lots, provided the tenderer meets the aggregate Eligibility and Qualification Criteria for all the Lots. The tenderer will be awarded the combination of Lots for which the tenderer qualifies and the others will be considered for award to second lowest the tenderers.

OPTION 2

The Procuring Entity will consider all possible combinations of won Lots [contract(s)] and determine the combinations with the lowest evaluated price. Tenders will then be awarded to the Tenderer or Tenderers in the combinations provided the tenderer meets the aggregate Eligibility and Qualification Criteria for all the won Lots.

5. Alternative Tenders (ITT 13.1)

An alternative if permitted under ITT 13.1, will be evaluated as follows:

The Procuring Entity shall consider Tenders offered for alternatives as specified in Part 2- Works Requirements. Only the technical alternatives, if any, of the Tenderer with the Best Evaluated Tender conforming to the basic technical requirements shall be considered by the Procuring Entity.

6. Margin of Preference is not applicable

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

a) In case the tender was subject to post-qualification, the contract shall be awarded to the lowest evaluated tenderer, subject to confirmation of pre-qualification data, if so required.

b) In case the tender was not subject 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 50,000,000 (Fifty Million Kenya Shillings Only).**

ii) Minimum average annual construction turnover of **Kenya Shillings 200,000,000 (Two Hundred Million Kenya Shillings Only),** equivalent calculated as total certified payments received for contracts in progress and/or completed within the last 3 (Three) years.

iii) At least *3 (Three) No* of contract(s) of a similar nature executed within Kenya, or the East African Community, that have been satisfactorily and substantially completed as a prime contractor, or joint venture member or sub-contractor each of minimum value Kenya shillings 100,000,000(one hundred million shillings each.

iv) Contractor's Representative and Key Personnel, which are specified as;

a) 2No.Technical Director- As above.
b) 1No Site Agent –As above
c) 5 No Site Foreman- As above

v) Contractors key equipment listed on the table "Contractor's Equipment" below and more specifically listed as *[specify requirements for each lot as applicable] ,*

a) Transport and Hauling Equipments- At least 5 No. self-owned tipper lorry (15 tones),
b) Concreting Equipments-
Concrete batching plant ready to be deployed to site for 1 year =6 Marks.
Self-loading concrete mixer ready to be deployed to site for 1 year =3 Marks.
Ordinary Concrete mixer ready to be deployed to site for 1 year = 1 Mark

c) Excavating Equipment-1No.Excavator/Bulldozer self-owned= 3Marks.
Excavator/Bulldozer leased-1 Mark ,

i) 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 3 (Three) years.** The required information shall be furnished in the appropriate form.

b) **Pending Litigation**

Financial position and prospective long-term profitability 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 **3 (Three)** ***years***. All parties to the contract shall furnish the information in the appropriate form about any litigation or arbitration resulting from contracts completed or ongoing 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.

8. QUALIFICATION FORM SUMMARY

Item No.	Qualification Subject	Qualification Requirement	*Document To be Completed by Tenderer*	*For Procuring Entity's Use (Qualification met or Not Met)*
1.	Nationality	Nationality in accordance with ITT 3.6	Forms ELI – 1.1 and 1.2, with attachments	
2.	Tax Obligations for Kenyan Tenderers	Has produced a current tax clearance certificate or tax exemption certificate issued by the Kenya Revenue Authority in accordance with ITT 3.14.	Form of Tender	
3.	Conflict of Interest	No conflicts of interest in accordance with ITT 3.3	Form of Tender	
4.	PPRA Eligibility	Not having been declared ineligible by the PPRA as described in ITT 3.8	Form of Tender	
5.	State- owned Enterprise	Meets conditions of ITT 3.7	Forms ELI – 1.1 and 1.2, with attachments	
6.	Goods, equipment and services to be supplied under the contract	To have their origin in any country that is not determined ineligible under ITT 4.1	Forms ELI – 1.1 and 1.2, with attachments	
7.	History of Non-Performing Contracts	Non-performance of a contract did not occur as a result of contractor default since 1st January 2018.	Form CON-2	
8.	Suspension Based on Execution of Tender/Proposal Securing Declaration by the Procuring Entity	Not under suspension based on-execution of a Tender/Proposal Securing Declaration pursuant to ITT 19.9	Form of Tender	
9.	Pending Litigation	Tender's financial position and prospective long-term profitability still sound according to criteria established in 3.1 and assuming that all pending litigation will NOT be resolved against the Tenderer.	Form CON – 2	
10	Litigation History	No consistent history of court/arbitral award decisions against the Tenderer since 1st January ***2018.***	Form CON – 2	
11	Financial Capabilities	(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 requirements estimated as Kenya Shillings 5*0,000,000 (Five* Hundred *Million Kenya Shilling)* equivalent for the subject contract(s) net of the Tenderer's other commitments. (ii) The Tenderers shall also demonstrate, to the satisfaction of the Procuring Entity, that it has adequate sources of	Form FIN – 3.1, with attachments	

		finance to meet the cash flow requirements on works currently in progress and for future contract commitments. (iii) The audited balance sheets or other financial statements acceptable to the Procuring Entity, for the **last*3 (Three*** *years* shall be submitted and must demonstrate the current soundness of the Tenderer's financial position and indicate its prospective long-term profitability.		
12	Average Annual Construction Turnover	Minimum average annual construction turnover of Kenya **Shillings 200,000,000 (*Two hundred Million Kenya Shillings)*,** equivalent calculated as total certified payments received for contracts in progress and/or completed within the **last *3 (Three)* years, divided by*/* years**	Form FIN – 3.2	
13	General Construction Experience	Experience under construction contracts in the role of prime contractor, JV member, sub-contractor, or management contractor for at least the last *[insert number of years]* years, starting 1st January *[insert year]*.	Form EXP – 4.1	
14	Specific Construction & Contract Management Experience	A minimum number of ***3 (Three)*** similar contracts specified below that have been satisfactorily and substantially completed as a prime contractor, joint venture member, management contractor or sub-contractor between 1st January 2018 and tender submission deadline i.e. 3 **(Three) contracts, each of minimum value Kenya shillings 100,000,000 (One hundred million Kenya shillings) equivalent**. The similarity of the contracts shall be based on the following: A. *Based on Section VII,* B. *Scope of Works,* C. *specify the minimum key requirements in terms of physical size, complexity, construction method, technology and/or other characteristics including part of the requirements that may be met by specialized subcontractors, if permitted in accordance with ITT 34.3]*	Form EXP 4.2(a)	

QUALIFICATION FORMS

1. FORM EQU; 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 ☐ Owned ☐ Rented ☐ Leased ☐ 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	

2. 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. The tenderer is required to Submit **Certified Form PER-2, Certified Certificates, Letters of Appointment etc,** ONLY for the staff as required for Technical evaluation. The staff listed shall be form the project construction team and **Failure to Produce** the listed staff during the implementation shall Amount to breach of contract for a successful tenderer.

Contractor' Representative and Key Personnel

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

	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]
5.	**Title of position:** *[insert title]*	
	Name of candidate	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]

3. FORM PER-2:

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

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

Name of Tenderer

Position [*#1*]: [*title of position from Form PER-1*]		
Personnel information	Name:	Date of birth:
	Address:	E-mail:
	Professional qualifications:	
	Academic qualifications:	
	Language proficiency: *[language and levels of speaking, reading and writing skills]*	
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**
[main project details]	*[role and responsibilities on the project]*	*[time in role]*	*[describe the experience relevant to this position]*

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:	*[insert period (start and end dates) for which this Contractor's Representative or Key Personnel is available to work on this contract]*
Time commitment:	*[insert period (start and end dates) for which this Contractor's Representative or Key Personnel is available to work on this contract]*

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): _____

4. TENDERER'S QUALIFICATION WITHOUT PRE-QUALIFICATION

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.

4.1 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: *[indicate country of Constitution]*
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 ☐ 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 ☐ In case of state-owned enterprise or institution, in accordance with ITT 3.8, documents establishing: • Legal and financial autonomy • Operation under commercial law • Establishing that the Tenderer is not under the supervision of the Procuring Entity 2. 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: _____
1. Attached are copies of original documents of ☐ 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. ☐ 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 3.8. 2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

4.3 FORM CON – 2

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			
☐ Contract non-performance did not occur since 1st January *[insert year]* specified in Section III, Evaluation and Qualification Criteria, Sub-Factor 2.1. ☐ Contract(s) not performed since 1st 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			
☐ No pending litigation in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3. ☐ 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			
☐ No Litigation History in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4. ☐ Litigation History in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4 as indicated below.			

Year of award	Outcome as percentage of Net Worth	Contract Identification	Total Contract Amount (currency), Kenya Shilling Equivalent (exchange rate)
[insert year]	*[insert 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]* Matter in dispute: *[indicate main issues in dispute]* Party who initiated the dispute: *[indicate "Procuring Entity" or "Contractor"]* Reason(s) for Litigation and award decision *[indicate main reason(s)]*	*[insert amount]*

4.4 FORM FIN – 3.1:

Financial Situation and Performance

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

4.4.1. 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)					

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**
Profits Before Taxes (PBT)					
Cash Flow Information					
Cash Flow from Operating Activities					

*Refer to ITT 15 for the exchange rate

4.4.2 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		

4.4.3 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 statements[1] for the _____years required above; and complying with the requirements

[1] 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.

4.5 FORM FIN – 3.2:

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**
[indicate year]	*[insert amount and indicate currency]*		
Average Annual Construction Turnover *			

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

4.6 FORM FIN – 3.3:

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		

4.7 FORM JOR 3.4:

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					
	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					

4.8 FORM EXP- 4.1

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: _____	

4.9 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 ☐	Member in JV ☐	Management Contractor ☐	Sub-contractor ☐
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:				

4.10 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	

NOTE;

Each Specific experience form Must be supported be a certificate of Practical completion and must be CERTIFIED/ENDOSED by the client./employer prior to submision.

Construction Experience in Key Activities

Tenderer's Name: _____
Date: _____
Tenderer's JV Member Name: _____
Sub-contractor's Name[2] (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.

1. Key Activity No One: _ _____

	Information			
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor ☐	Member in JV ☐	Management Contractor ☐	Sub-contractor ☐
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

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

2. Activity No. Two
3. ……

OTHER FORMS

5. 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: …… .

Request for Tender No.: ……... .

Name and description of Tender …….. .

To: ……[*name of Procuring Entity*]

Dear Sirs,

1. In accordance with the Conditions of Contract, Specifications, Drawings and Bills of Quantities for the execution of the above named Works, we, the undersigned offer to construct and complete the Works and remedy any defects therein for the sum 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 Project Manager's notice to commence, and to complete the whole of the Works comprised in the Contract within the time stated in the Special Conditions of Contract.

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

4. Unless and until a formal Agreement is prepared and executed this tender together with your written acceptance thereof, shall constitute a binding Contract between us. We further understand that you are not bound to accept the lowest or any tender you may receive.

5. We, the undersigned, 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 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:.....

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

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

b) 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*];

viii) *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;

ix) *Performance Security:* If our Tender is accepted, we commit to obtain a Performance Security in accordance with the Tendering document;

x) *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 subcontractor, and meet the requirements of ITT 3.4, other than alternative Tenders submitted in accordance with ITT 13.3;

xi) *Suspension and Debarment:* We, along with any of our subcontractors, suppliers, Project Manager, 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.

xii) *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 ITT 3.8*];

xiii) *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.")

xiv) 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;

xv) 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;

xvi) Fraud and Corruption: We hereby 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;

xvii) 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.

xviii) 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.

xix) 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 not in any conflict to interest.
   b) Certificate of Independent Tender Determination – to declare that we completed the tender without colluding with other tenderers.
   c) 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: …….

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…… day of ……., Year of ……..

Witnessed by……. [Name)] ……. [signature]……[Date]

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 (*postal and physical addresses, email, and telephone number*) 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 (*postal and physical addresses, email, and telephone number*) 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			

ii) 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		

	Type of Conflict	Disclosure YES OR NO	If YES provide details of the relationship with Tenderer
	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 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.		

f) 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)*

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].

C. SELF - DECLARATION FORMS

FORM SD1

SELF DECLARATION THAT THE PERSON/TENDERER IS NOT DEBARRED IN THE MATTER OF THE PUBLIC PROCUREMENTAND ASSET DISPOSALACT 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 herein 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 ….……....., *(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 herein 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 hereby 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

2. 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.

3. Requirements

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.

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 asset 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 into, take part in any decision relating to the procurement or contract; and

c) shall not be a subcontractor for the bidder to whom was awarded contract, or a member of the group of bidders 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.

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;

iv) "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;

v) "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 award[1] 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 sanction or 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 inspect[2] 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.

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[1] *For the avoidance of doubt, a party's ineligibility to be awarded a contract shall include, 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.*

[2] *Inspections 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*

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_____(herein 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 be provided 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.

TENDER-SECURING DECLARATION FORM

[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]*

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

PART II - WORK REQUIREMENTS

SECTION V - DRAWINGS

A list of drawings should be inserted here. The actual drawings including Site plans should be annexed in a separate booklet.

SECTION VI - SPECIFICATIONS

Notes for preparing Specifications

1. Specifications must be drafted to present a clear and precise statement of the required standards of materials, and workmanship for tenderers to respond realistically and competitively to the requirements of the Procuring Entity and ensure responsiveness of tenders. The Specifications should require that all materials, plant, and other supplies to be permanently incorporated in the Works be new, unused, of the most recent or current models, and incorporating all recent improvements in design and materials unless provided otherwise in the Contract. Where the Contractor is responsible for the design of any part of the permanent Works, the extent of his obligations must be stated.

2. Specifications from previous similar projects are useful and may not be necessary to re-write specifications for every Works Contract.

3. There are considerable advantages in standardizing **General Specifications** for repetitive Works in recognized public sectors, such as highways, urban housing, irrigation and water supply. The General Specifications should cover all classes of workmanship, materials and equipment commonly involved in constructions, although not necessarily to be used in a particular works contract. Deletions or addenda should then adapt the General Specifications to the particular Works.

4. Care must be taken in drafting Specifications to ensure they are not restrictive. In the Specifications of standards for materials, plant and workmanship, existing Kenya Standards should be used as much as possible, otherwise recognized international standards may also be used.

5. The Procuring Entity should decide whether technical solutions to specified parts of the Works are to be permitted. Alternatives are appropriate in cases where obvious (and potentially less costly) alternatives are possible to the technical solutions indicated in tender documents for certain elements of the Works, taking into consideration the comparative specialized advantage of potential tenderers.

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

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

SECTION VII- BILLS OF QUANTITIES

1. Objectives

The objectives of the Bill of Quantities are:

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

b) when a Contract has been entered into, to provide a priced Bill of Quantities for use in the periodic valuation of Works executed.

In order to attain these objectives, Works should be itemized in the Bill of Quantities in sufficient detail to distinguish between the different classes of Works, or between Works of the same nature carried out in different locations or in other circumstances which may give rise to different considerations of cost. Consistent with these requirements, the layout and contents of the Bill of Quantities should be as simple and brief as possible.

2. Day work Schedule

A Day work Schedule should be included only if the probability of unforeseen work, outside the items included in the Bill of Quantities, is high. To facilitate checking by the Procuring Entity of the realism of rates quoted by the Tenderers, the Day work Schedule should normally comprise the following:

a) A list of the various classes of labor, materials, and Constructional Plant for which basic day work rates or prices are to be inserted by the Tenderer, together with a statement of the conditions under which the Contractor shall be paid for work executed on a day work basis.

b) Nominal quantities for each item of day work, to be priced by each Tenderer at day work rates as Tender. The rate to be entered by the Tenderer against each basic day work item should include the Contractor's profit, overheads, supervision, and other charges.

3. Provisional Sums

A general provision for physical contingencies (quantity overruns) may be made by including a provisional sum in the Summary Bill of Quantities. Similarly, a contingency allowance for possible price increases should be provided as a provisional sum in the Summary priced Bill of Quantities. The inclusion of such provisional sums often facilitates budgetary approval by avoiding the need to request periodic supplementary approvals as the future need arises. Where such provisional sums or contingency allowances are used, the Special Conditions of Contract should state the manner in which they shall be used, and under whose authority (usually the Project Manager's).

The estimated cost of specialized work to be carried out, or of special goods to be supplied, by other contractors should be indicated in the relevant part of the Bill of Quantities as a particular provisional sum with an appropriate brief description. A separate procurement procedure is normally carried out by the Procuring Entity to select such specialized contractors. To provide an element of competition among the Tenderers in respect of any facilities, amenities, attendance, etc., to be provided by the successful Tenderer as prime Contractor for the use and convenience of the specialist contractors, each related provisional sum should be followed by an item in the Bill of Quantities inviting the Tenderer to quote a sum for such amenities, facilities, attendance, etc.

These Notes for Preparing a Bill of Quantities are intended only as information for the Procuring Entity or the person drafting the tendering document. They should not be included in the final tendering document.

4. The Bills of Quantities

The Bills of Quantities should be divided generally into the following sections:

a) Preambles

b) Preliminary items

c) Work Items
c) Daywork Schedule;and
d) Provisional items
e) Summary

5. **The Summary to the Bills of Quantities** will take this form or some other form but including these items.

SUMMARY ITEMS	*Page*	*Amount*
Bill No. 1: Preliminary Items		
Bill No. 2: Work Items		
Bill No 3: Daywork Summary		
Bill No 4: Provisional Sums		
Subtotal of Bills No 1-4		
Allow for any Discounts [i]		
TOTAL TENDER PRICE Carried forward to Form of Tender		

SECTION VIII - GENERAL CONDITIONS OF CONTRACT

These General Conditions of Contract (GCC), read in conjunction with the Special Conditions of Contract (SCC) and other documents listed therein, should be a complete document expressing fairly the rights and obligations of both parties.

These General Conditions of Contract have been developed on the basis of considerable international experience in the drafting and management of contracts, bearing in mind a trend in the construction industry towards simpler, more straightforward language.

The GCC can be used for both smaller admeasurement contracts and lump sum contracts.

General Conditions of Contract

A. General

1. Definitions

1.1 Bold face type is used to identify defined terms.

a) **The 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.

b) **The Activity Schedule** is a schedule of the activities comprising the construction, installation, testing, and commissioning of the Works in a lump sum contract. It includes a lump sum price for each activity, which is used for valuations and for assessing the effects of Variations and Compensation Events.

c) **The Adjudicator** is the person appointed jointly by the Procuring Entity and the Contractor to resolve disputes in the first instance, as provided for in GCC 23.

d) **Bill of Quantities** means the priced and completed Bill of Quantities forming part of the Bid.

e) **Compensation Events** are those defined in GCC Clause 42 hereunder.

f) **The Completion Date** is the date of completion of the Works as certified by the Project Manager, in accordance with GCC Sub-Clause 53.1.

g) **The Contract** is the Contract between the Procuring Entity and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in GCC Sub-Clause 2.3 below.

h) **The Contractor** is the party whose Bid to carry out the Works has been accepted by the Procuring Entity.

i) **The Contractor's Bid** is the completed bidding document submitted by the Contractor to the Procuring Entity.

j) **The Contract Price** is the Accepted Contract Amount stated in the Letter of Acceptance and thereafter as adjusted in accordance with the Contract.

k) **Days** are calendar days; months are calendar months.

l) **Day work**s are varied work inputs subject to payment on a time basis for the Contractor's employees and Equipment, in addition to payments for associated Materials and Plant.

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

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

o) **The Defects Liability Period** is the period **named in the SCC** pursuant to Sub-Clause 34.1 and calculated from the Completion Date.

p) **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, include calculations and other information provided or approved by the Project Manager for the execution of the Contract.

q) **The Procuring Entity** is the party who employs the Contractor to carry out the Works, **as specified in the SCC,** who is also the Procuring Entity.

r) **Equipmen**t is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.

s) **"In writing" or "written"** means hand-written, type-written, printed or electronically made, and resulting in a permanent record;

t) The Initial Contract Price is the Contract Price listed in the Procuring Entity's Letter of Acceptance.

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

v) **Materials** are all supplies, including consumables, used by the Contractor for incorporation in the Works.

w) **Plant i**s any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function.

x) **The Project Manager** is the person **named in the SCC** (or any other competent person appointed by the Procuring Entity and notified to the Contractor, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract.

y) **SCC** means Special Conditions of Contract.

z) **The Site** is the area of the works as **defined as such in the SCC**.

aa) **Site Investigation Reports** are those that were included in the bidding document and are factual and interpretative reports about the surface and subsurface conditions at the Site.

bb) **Specification** means the Specification of the Works included in the Contract and any modification or addition made or approved by the Project Manager.

cc) **The Start Date** is **given in the SCC**. It is the latest date when the Contractor shall commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates.

dd) **A Subcontractor** is a person or corporate body who has a Contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site.

ee) **Temporary Works** are works designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the Works.

ff) **A Variation** is an instruction given by the Project Manager which varies the Works.

gg) **The Works** are what the Contract requires the Contractor to construct, install, and turn over to the Procuring Entity, **as defined in the SCC**.

2. Interpretation

2.1 In interpreting these GCC, words indicating one gender include all genders. Words indicating the singular also include the plural and words indicating the plural also include the singular. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Project Manager shall provide instructions clarifying queries about these GCC.

2.2 If sectional completion is specified in the SCC, references in the GCC to the Works, the Completion Date, and the Intended Completion Date apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).

2.3 The documents forming the Contract shall be interpreted in the following order of priority:

a) Agreement,
b) Letter of Acceptance,
c) Contractor's Bid,
d) Special Conditions of Contract,
e) General Conditions of Contract, including Appendices,
f) Specifications,
g) Drawings,
h) Bill of Quantities[6], and
i) any other document **listed in the SCC** as forming part of the Contract.

[6] *In lump sum contracts, delete "Bill of Quantities" and replace with "Activity Schedule."*

3. Language and Law

3.1 The language of the Contract is English Language and the law governing the Contract are the Laws of Kenya.

3.2 Throughout the execution of the Contract, the Contractor shall comply with the import of goods and services prohibitions in the Procuring Entity's Country when

a) as a matter of law or official regulations, Kenya prohibits commercial relations with that country; or

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 from that country or any payments to any country, person, or entity in that country.

4. Project Manager's Decisions

4.1 Except where otherwise specifically stated, the Project Manager shall decide contractual matters between the Procuring Entity and the Contractor in the role representing the Procuring Entity.

5. Delegation

5.1 Otherwise **specified in the SCC,** the Project Manager may delegate any of his duties and responsibilities to other people, except to the Adjudicator, after notifying the Contractor, and may revoke any delegation after notifying the Contractor.

6. Communications

6.1 Communications between parties that are referred to in the Conditions shall be effective only when in writing. A notice shall be effective only when it is delivered.

7. Subcontracting

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

8. Other Contractors

8.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Procuring Entity between the dates given in the Schedule of Other Contractors, as **referred to in the SCC.** The Contractor shall also provide facilities and services for them as described in the Schedule. The Procuring Entity may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification.

9. Personnel and Equipment

9.1 The Contractor shall employ the key personnel and use the equipment identified in its Bid, to carry out the Works or other personnel and equipment approved by the Project Manager. The Project Manager shall approve any proposed replacement of key personnel and equipment only if their relevant qualifications or characteristics are substantially equal to or better than those proposed in the Bid.

9.2 If the Project Manager asks the Contractor to remove a person who is a member of the Contractor's staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the work in the Contract.

9.3 If the Procuring Entity, Project Manager or Contractor determines, that any employee of the Contractor be determined to have engaged in Fraud and Corruption during the execution of the Works, then that employee shall be removed in accordance with Clause 9.2 above.

10. Procuring Entity's and Contractor's Risks

10.1 The Procuring Entity carries the risks which this Contract states are Procuring Entity's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.

11. Procuring Entity's Risks

11.1 From the Start Date until the Defects Liability Certificate has been issued, the following are Procuring Entity's risks:

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

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

ii) negligence, breach of statutory duty, or interference with any legal right by the Procuring Entity or by any person employed by or contracted to him except the Contractor.

b) The risk of damage to the Works, Plant, Materials, and Equipment to the extent that it is due to a fault of the Procuring Entity or in the Procuring Entity's design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.

11.2 From the Completion Date until the Defects Liability Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is a Procuring Entity's risk except loss or damage due to

aa) a Defect which existed on the Completion Date,

bb) an event occurring before the Completion Date, which was not itself a Procuring Entity's risk, or

cc) the activities of the Contractor on the Site after the Completion Date.

12. Contractor's Risks

12.1 From the Starting Date until the Defects Liability Certificate has been issued, the risks of personal injury, death, and loss of or damage to property (including, without limitation, the Works, Plant, Materials, and Equipment) which are not Procuring Entity's risks are Contractor's risks.

13. Insurance

13.1 The Contractor shall provide, in the joint names of the Procuring Entity and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles **stated in the SCC** for the following events which are due to the Contractor's risks:

a) loss of or damage to the Works, Plant, and Materials;

b) loss of or damage to Equipment;

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

d) personal injury or death.

13.2 Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager's approval before the Start Date. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.

13.3 If the Contractor does not provide any of the policies and certificates required, the Procuring Entity may effect the insurance which the Contractor should have provided and recover the premiums the Procuring Entity has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.

13.4 Alterations to the terms of an insurance shall not be made without the approval of the Project Manager.

13.5 Both parties shall comply with any conditions of the insurance policies.

14. Site Data

14.1 The Contractor shall be deemed to have examined any Site Data **referred to in the SCC**, supplemented by any information available to the Contractor.

15. Contractor to Construct the Works

15.1 The Contractor shall construct and install the Works in accordance with the Specifications and Drawings.

16. The Works to Be Completed by the Intended Completion Date

16.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the Program submitted by the Contractor, as updated with the approval of the Project Manager, and complete them by the Intended Completion Date.

17. Approval by the Project Manager

17.1 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Project Manager, for his approval.

17.2 The Contractor shall be responsible for design of Temporary Works.

17.3 The Project Manager's approval shall not alter the Contractor's responsibility for design of the Temporary Works.

17.4 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.

17.5 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Project Manager before this use.

18. Safety

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

19. Discoveries

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

20. Possession of the Site

20.1 The Procuring Entity shall give possession of all parts of the Site to the Contractor. If possession of a part is not given by the date **stated in the SCC,** the Procuring Entity shall be deemed to have delayed the start of the relevant activities, and this shall be a Compensation Event.

21. Access to the Site

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

22. Instructions, Inspections and Audits

22.1 The Contractor shall carry out all instructions of the Project Manager which comply with the applicable laws where the Site is located.

22.2 The Contractor shall keep, and shall make all reasonable efforts to cause its Subcontractors and sub-consultants to keep, accurate and systematic accounts and records in respect of the Works in such form and details as will clearly identify relevant time changes and costs.

22.3 The Contractor shall permit and shall cause its subcontractors and sub-consultants to permit, the Procuring Entity and/or persons appointed by the Public Procurement Regulatory Authority 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 Public Procurement Regulatory Authority. The Contractor's and its Subcontractors' and sub-consultants' attention is drawn to Sub-Clause 25.1 (Fraud and Corruption) which provides, inter alia, that acts intended to materially impede the exercise of the Public Procurement Regulatory Authority's inspection and audit rights constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility pursuant to the Public Procurement Regulatory Authority's prevailing sanctions procedures).

23. Appointment of the Adjudicator

23.1 The Adjudicator shall be appointed jointly by the Procuring Entity and the Contractor, at the time of the Procuring Entity's issuance of the Letter of Acceptance. If, in the Letter of Acceptance, the Procuring Entity does not agree on the appointment of the Adjudicator, the Procuring Entity will request the Appointing Authority designated in the SCC, to appoint the Adjudicator within 14 days of receipt of such request.

23.2 Should the Adjudicator resign or die, or should the Procuring Entity and the Contractor agree that the Adjudicator is not functioning in accordance with the provisions of the Contract, a new Adjudicator shall be jointly appointed by the Procuring Entity and the Contractor. In case of disagreement between the Procuring Entity and the Contractor, within 30 days, the Adjudicator shall be designated by the Appointing Authority designated in the SCC at the request of either party, within 14 days of receipt of such request.

24. Settlement of Claims and Disputes

24.1 Contractor's Claims

24.1.1 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 Project Manager, 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.

24.1.2 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.

24.1.3 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.

24.1.4 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 Project Manager. Without admitting the Procuring Entity's liability, the Project Manager 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 Project Manager to inspect all these records, and shall (if instructed) submit copies to the Project Manager.

24.1.5 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 Project Manager, the Contractor shall send to the Project Manager a 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 Project Manager 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 Project Manager.

24.1.6 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 Project Manager and approved by the Contractor, the Project Manager 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.

24.1.7 Within the above defined period of 42 days, the Project Manager shall proceed in accordance with Sub-Clause

24.1.8 [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.

24.1.9 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.

24.1.10 If the Project Manager does not respond within the timeframe defined in this Clause, either Party may consider that the claim is rejected by the Project Manager and any of the Parties may refer to Arbitration in accordance with Sub-Clause 24.4 [Arbitration].

24.1.11 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 24.3.

24.2 Amicable Settlement

24.2.1 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 24.1 above should move to commence arbitration after the fifty-sixth day from the day on which a notice of a claim was given, even if no attempt at an amicable settlement has been made.

24.3 Matters that may be referred to arbitration

24.3.1 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) The appointment of a replacement Project Manager upon the said person ceasing to act.
b) Whether or not the issue of an instruction by the Project Manager is empowered by these Conditions.
c) Whether or not a certificate has been improperly withheld or is not in accordance with these Conditions.
e) Any dispute arising in respect of war risks or war damage.
f) 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.

24.4 Arbitration

24.4.1 Any claim or dispute between the Parties arising out of or in connection with the Contract not settled amicably in accordance with Sub-Clause 24.3 shall be finally settled by arbitration.

24.4.2 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.

24.4.3 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.

24.4.4 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.

24.4.5 The Arbitrator shall, without prejudice to the generality of his powers, have powers to open up, review and revise any certificate, opinion, decision, requirement or notice and to determine all matters in dispute which shall be submitted to him in the same manner as if no such certificate, opinion, decision requirement or notice had been given.

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

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

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

24.4.9 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.

24.5 Arbitration with National Contractors

24.5.1 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

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

24.6 Alternative Arbitration Proceedings

24.6.1 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.

24.7 Failure to Comply with Arbitrator's Decision

24.7.1 The award of such Arbitrator shall be final and binding upon the parties.

24.7.2 In the event 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.

24.8 Contract operations to continue

24.8.1 Notwithstanding any reference to arbitration herein,

a) the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree; and
b) the Procuring Entity shall pay the Contractor any monies due the Contractor.

25. Fraud and Corruption

25.1 The Government requires compliance with the country's Anti-Corruption laws and its prevailing sanctions policies and procedures as set forth in the Constitution of Kenya and its Statutes.

25.2 The Procuring Entity requires the Contractor to disclose any commissions or fees that may have been paid or are to be paid to agents or any other party with respect to the bidding process or execution of the Contract. The information disclosed must include at least the name and address of the agent or other party, the amount and currency, and the purpose of the commission, gratuity or fee.

B. Time Control

26. Program

26.1 Within the time stated in the SCC, after the date of the Letter of Acceptance, the Contractor shall submit to the Project Manager for approval a Program showing the general methods, arrangements, order, and timing for all the activities in the Works. In the case of a lump sum contract, the activities in the Program shall be consistent with those in the Activity Schedule.

26.2 An update of the Program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.

26.3 The Contractor shall submit to the Project Manager for approval an updated Program at intervals no longer than the period stated in the SCC. If the Contractor does not submit an updated Program within this period, the Project Manager may withhold the amount stated in the SCC from the next payment certificate and

entitled to withhold this amount until the next payment after the date on which the overdue Program has been submitted. In the case of a lump sum contract, the Contractor shall provide an updated Activity Schedule within 14 days of being instructed to by the Project Manager.

26.4 The Project Manager's approval of the Program shall not alter the Contractor's obligations. The Contractor may revise the Program and submit it to the Project Manager again at any time. A revised Program shall show the effect of Variations and Compensation Events.

27. Extension of the Intended Completion Date

27.1 The Project Manager shall extend the Intended Completion Date if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work, which would cause the Contractor to incur additional cost.

27.2 The Project Manager shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Project Manager for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Intended Completion Date.

28. Acceleration

28.1 When the Procuring Entity wants the Contractor to finish before the Intended Completion Date, the Project Manager shall obtain priced proposals for achieving the necessary acceleration from the Contractor. If the Procuring Entity accepts these proposals, the Intended Completion Date shall be adjusted accordingly and confirmed by both the Procuring Entity and the Contractor.

28.2 If the Contractor's priced proposals for an acceleration are accepted by the Procuring Entity, they are incorporated in the Contract Price and treated as a Variation.

29. Delays Ordered by the Project Manager

29.1 The Project Manager may instruct the Contractor to delay the start or progress of any activity within the Works.

30. Management Meetings

30.1 Either the Project Manager or the Contractor may require the other to attend a management meeting. The business of a management meeting shall be to review the plans for remaining work and to deal with matters raised in accordance with the early warning procedure.

30.2 The Project Manager shall record the business of management meetings and provide copies of the record to those attending the meeting and to the Procuring Entity. The responsibility of the parties for actions to be taken shall be decided by the Project Manager either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

31. Early Warning

31.1 The Contractor shall warn the Project Manager at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the work, increase the Contract Price, or delay the execution of the Works. The Project Manager may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be provided by the Contractor as soon as reasonably possible.

31.2 The Contractor shall cooperate with the Project Manager in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any resulting instruction of the Project Manager.

C. Quality Control

32. Identifying Defects

32.1 The Project Manager shall check the Contractor's work and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Project Manager may instruct the Contractor to search for a Defect and to uncover and test any work that the Project Manager considers may have a Defect.

33. Tests

33.1 If the Project Manager instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples. If there is no Defect, the test shall be a Compensation Event.

34. Correction of Defects

34.1 The Project Manager shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion, and is defined in the SCC. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.

34.2 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Project Manager's notice.

35. Uncorrected Defects

35.1 If the Contractor has not corrected a Defect within the time specified in the Project Manager's notice, the Project Manager shall assess the cost of having the Defect corrected, and the Contractor shall pay this amount.

D. Cost Control

36. Contract Price[7]

36.1 The Bill of Quantities shall contain priced items for the Works to be performed by the Contractor. The Bill of Quantities is used to calculate the Contract Price. The Contractor will be paid for the quantity of the work accomplished at the rate in the Bill of Quantities for each item.

37. Changes in the Contract Price[8]

37.1 If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25 percent, provided the change exceeds 1 percent of the Initial Contract Price, the Project Manager shall adjust the rate to allow for the change. The Project Manager shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15 percent, except with the prior approval of the Procuring Entity.

37.2 If requested by the Project Manager, the Contractor shall provide the Project Manager with a detailed cost breakdown of any rate in the Bill of Quantities.

38. Variations

38.1 All Variations shall be included in updated Programs9 produced by the Contractor.

38.2 The Contractor shall provide the Project Manager with a quotation for carrying out the Variation when requested to do so by the Project Manager. The Project Manager shall assess the quotation, which shall be given within seven (7) days of the request or within any longer period stated by the Project Manager and before the Variation is ordered.

38.3 If the Contractor's quotation is unreasonable, the Project Manager may order the Variation and make a change to the Contract Price, which shall be based on the Project Manager's own forecast of the effects of the Variation on the Contractor's costs.

38.4 If the Project Manager decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the work, no quotation shall be given and the Variation shall be treated as a Compensation Event.

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[7] *In lump sum contracts, replace GCC Sub-Clauses 36.1 as follows:*

36.1 The Contractor shall provide updated Activity Schedules within 14 days of being instructed to by the Project Manager. The Activity Schedule shall contain the priced activities for the Works to be performed by the Contractor. The Activity Schedule is used to monitor and control the performance of activities on which basis the Contractor will be paid. If payment for materials on site shall be made separately, the Contractor shall show delivery of Materials to the Site separately on the Activity Schedule.

[8] *In lump sum contracts, replace entire GCC Clause 37 with new GCC Sub-Clause 37.1, as follows:*
The Activity Schedule shall be amended by the Contractor to accommodate changes of Program or method of working made at the Contractor's own discretion. Prices in the Activity Schedule shall not be altered when the Contractor makes such changes to the Activity Schedule.

In lump sum contracts, add "and Activity Schedules" after "Programs." In lump sum contracts, delete this paragraph.

38.5 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning

38.6 If the work in the Variation corresponds to an item description in the Bill of Quantities and if, in the opinion of the Project Manager, the quantity of work above the limit stated in Sub-Clause 39.1 or the timing of its execution do not cause the cost per unit of quantity to change, the rate in the Bill of Quantities shall be used to calculate the value of the Variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the Variation does not correspond with items in the Bill of Quantities, the quotation by the Contractor shall be in the form of new rates for the relevant items of work

38.7 Value Engineering: The Contractor may prepare, at its own cost, a value engineering proposal at any time during the performance of the contract. The value engineering proposal shall, at a minimum, include the following;

a) the proposed change(s), and a description of the difference to the existing contract requirements;
b) a full cost/benefit analysis of the proposed change(s) including a description and estimate of costs (including life cycle costs) the Procuring Entity may incur in implementing the value engineering proposal; and
c) a description of any effect(s) of the change on performance/functionality.

38.8 The Procuring Entity may accept the value engineering proposal if the proposal demonstrates benefits that:

a) accelerate the contract completion period; or
b) reduce the Contract Price or the life cycle costs to the Procuring Entity; or
c) improve the quality, efficiency, safety or sustainability of the Facilities; or
d) yield any other benefits to the Procuring Entity, without compromising the functionality of the Works.

38.9 If the value engineering proposal is approved by the Procuring Entity and results in:

a) a reduction of the Contract Price; the amount to be paid to the Contractor shall be the **percentage specified in the SCC** of the reduction in the Contract Price; or
b) an increase in the Contract Price; but results in a reduction in life cycle costs due to any benefit described in (a) to (d) above, the amount to be paid to the Contractor shall be the full increase in the Contract Price.

39. Cash Flow Forecasts

39.1 When the Program[11], is updated, the Contractor shall provide the Project Manager with an updated cash flow forecast. The cash flow forecast shall include different currencies, as defined in the Contract, converted as necessary using the Contract exchange rates.

40. Payment Certificates

40.1 The Contractor shall submit to the Project Manager monthly statements of the estimated value of the work executed less the cumulative amount certified previously.

40.2 The Project Manager shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor.

40.3 The value of work executed shall be determined by the Project Manager.

40.4 The value of work executed shall comprise the value of the quantities of work in the Bill of Quantities that have been completed12.

40.5 The value of work executed shall include the valuation of Variations and Compensation Events.

40.6 The Project Manager may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.

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

41. Payments

41.1 Payments shall be adjusted for deductions for advance payments and retention. The Procuring Entity shall pay the Contractor the amounts certified by the Project Manager within 30 days of the date of each certificate. If the Procuring Entity makes a late payment, the Contractor shall be paid interest on the late payment in the next payment. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made at the prevailing rate of interest for commercial borrowing for each of the currencies in which payments are made.

41.2 If an amount certified is increased in a later certificate or as a result of an award by the Adjudicator or an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.

41.3 Unless otherwise stated, all payments and deductions shall be paid or charged in the proportions of currencies comprising the Contract Price.

41.4 Items of the Works for which no rate or price has been entered in shall not be paid for by the Procuring Entity and shall be deemed covered by other rates and prices in the Contract.

42. Compensation Events

42.1 The following shall be Compensation Events:

d) The Procuring Entity does not give access to a part of the Site by the Site Possession Date pursuant to GCC Sub-Clause 20.1.

e) The Procuring Entity modifies the Schedule of Other Contractors in a way that affects the work of the Contractor under the Contract.

f) The Project Manager orders a delay or does not issue Drawings, Specifications, or instructions required for execution of the Works on time.

g) The Project Manager instructs the Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects.

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

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

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

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

l) The advance payment is delayed.

m) The effects on the Contractor of any of the Procuring Entity's Risks.

n) The Project Manager unreasonably delays issuing a Certificate of Completion.

42.2 If a Compensation Event would cause additional cost or would prevent the work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.

42.3 As soon as information demonstrating the effect of each Compensation Event upon the Contractor's forecast cost has been provided by the Contractor, it shall be assessed by the Project Manager, and the Contract Price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Project Manager shall adjust the Contract Price based on the Project Manager's own forecast. The Project Manager shall assume that the Contractor shall react competently and promptly to the event.

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[11] *In lump sum contracts, add "or Activity Schedule" after "Program."*

[12] *In lump sum contracts, replace this paragraph with the following: "The value of work executed shall comprise the value of completed activities in the Activity Schedule."*

42.4 The Contractor shall not be entitled to compensation to the extent that the Procuring Entity's interests are adversely affected by the Contractor's not having given early warning or not having cooperated with the Project Manager.

43. Tax

43.1 The Project Manager shall adjust the Contract Price if taxes, duties, and other levies are changed between the date 30 days before the submission of bids for the Contract and the date of the last Completion certificate. The adjustment shall be the change in the amount of tax payable by the Contractor, provided such changes are not already reflected in the Contract Price or are a result of GCC Clause 44.

44. Currency y of Payment

44.1 All payments under the contract shall be made in Kenya Shillings

45. Price Adjustment

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

P = A + B Im/Io

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

A and B are coefficients[13] **specified in the SCC,** representing the non-adjustable and adjustable portions, respectively, of the Contract Price payable and Im is the index prevailing at the end of the month being invoiced and IOC is the index prevailing 30 days before Bid opening for inputs payable.

45.2 If the value of the index is changed after it has been used in a calculation, the calculation shall be corrected and an adjustment made in the next payment certificate. The index value shall be deemed to take account of all changes in cost due to fluctuations in costs.

46. Retention

46.1 The Procuring Entity shall retain from each payment due to the Contractor the proportion stated in the **SCC** until Completion of the whole of the Works.

46.2 Upon the issue of a Certificate of Completion of the Works by the Project Manager, in accordance with GCC 53.1, half the total amount retained shall be repaid to the Contractor and half when the Defects Liability Period has passed and the Project Manager has certified that all Defects notified by the Project Manager to the Contractor before the end of this period have been corrected. The Contractor may substitute retention money with an "on demand" Bank guarantee.

47. Liquidated Damages

47.1 The Contractor shall pay liquidated damages to the Procuring Entity at the rate per day stated in the **SCC** for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount defined in the SCC. The Procuring Entity may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's liabilities.

47.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in GCC Sub-Clause 41.1.

48. Bonus

48.1 The Contractor shall be paid a Bonus calculated at the rate per calendar day **stated in the SCC** for each day (less any days for which the Contractor is paid for acceleration) that the Completion is earlier than the Intended Completion Date. The Project Manager shall certify that the Works are complete, although they may not be due to be complete.

49. Advance Payment

49.1 The Procuring Entity shall make advance payment to the Contractor of the amounts stated in the **SCC** by the date stated in the **SCC**, against provision by the Contractor of an Unconditional Bank Guarantee in a form and by a bank acceptable to the Procuring Entity in amounts and currencies equal to the advance payment. The Guarantee shall remain effective until the advance payment has been repaid, but the amount of the Guarantee shall be progressively reduced by the amounts repaid by the Contractor. Interest shall not be charged on the advance payment.

49.2 The Contractor is to use the advance payment only to pay for Equipment, Plant, Materials, and mobilization expenses required specifically for execution of the Contract. The Contractor shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the Project Manager.

49.3 The advance payment shall be repaid by deducting proportionate amounts from payments otherwise due to the Contractor, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the advance payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, Bonuses, or Liquidated Damages.

50. Securities

50.1 The Performance Security shall be provided to the Procuring Entity no later than the date specified in the Letter of Acceptance and shall be issued in an amount **specified in the SCC,** by a bank or surety acceptable to the Procuring Entity, and denominated in the types and proportions of the currencies in which the Contract Price is payable. The Performance Security shall be valid until a date 28 day from the date of issue of the Certificate of Completion in the case of a Bank Guarantee, and until one year from the date of issue of the Completion Certificate in the case of a Performance Bond.

51. Dayworks

51.1 If applicable, the Dayworks rates in the Contractor's Bid shall be used only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.

51.2 All work to be paid for as Dayworks shall be recorded by the Contractor on forms approved by the Project Manager. Each completed form shall be verified and signed by the Project Manager within two days of the work being done.

51.3 The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.

52. Cost of Repairs

52.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Correction periods shall be remedied by the Contractor at the Contractor's cost if the loss or damage arises from the Contractor's acts or omissions.

E. Finishing the Contract

53. Completion

53.1 The Contractor shall request the Project Manager to issue a Certificate of Completion of the Works, and the Project Manager shall do so upon deciding that the whole of the Works is completed.

54. Taking Over

54.1 The Procuring Entity shall take over the Site and the Works within seven days of the Project Manager's issuing a certificate of Completion.

55. Final Account

55.1 The Contractor shall supply the Project Manager with a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Project Manager shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 56 days of receiving the Contractor's account if it is correct and complete. If it is not, the Project Manager shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a payment certificate.

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[13] *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 non-adjustable components.*

56. Operating and Maintenance Manuals

56.1 If "as built" Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the SCC.

56.2 If the Contractor does not supply the Drawings and/or manuals by the dates stated in the SCC pursuant to GCC Sub-Clause 56.1, or they do not receive the Project Manager's approval, the Project Manager shall withhold the amount **stated in the SCC** from payments due to the Contractor.

57. Termination

57.1 The Procuring Entity or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.

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

a) the Contractor stops work for 30 days when no stoppage of work is shown on the current Program and the stoppage has not been authorized by the Project Manager;
b) the Project Manager instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within 30 days;
c) the Procuring Entity or the Contractor is made bankrupt or goes into liquidation other than for a reconstruction oramalgamation;
d) a payment certified by the Project Manager is not paid by the Procuring Entity to the Contractor within 84 days of the date of the Project Manager's certificate;
e) the Project Manager gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Project Manager;
f) the Contractor does not maintain a Security, which is required;
g) the Contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, as **defined in the SCC**; or
h) if the Contractor, in the judgment of the Procuring Entity has engaged in Fraud and Corruption, as defined in paragraph 2.2 a of the Appendix A to the GCC, in competing for or in executing the Contract, then the Procuring Entity may, after giving fourteen (14) days written notice to the Contractor, terminate the Contract and expel him from the Site.

57.3 Notwithstanding the above, the Procuring Entity may terminate the Contract for convenience.

57.4 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as reasonably possible.

57.5 When either party to the Contract gives notice of a breach of Contract to the Project Manager for a cause other than those listed under GCC Sub-Clause 56.2 above, the Project Manager shall decide whether the breach is fundamental ornot.

58. Payment upon Termination

58.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Project Manager shall issue a certificate for the value of the work done and Materials ordered less advance payments received up to the date of the issue of the certificate and less the percentage to apply to the value of the work not completed, as specified in the SCC. Additional Liquidated Damages shall not apply. If the total amount due to the Procuring Entity exceeds any payment due to the Contractor, the difference shall be a debt payable to the Procuring Entity.

58.2 If the Contract is terminated for the Procuring Entity's convenience or because of a fundamental breach of Contract by the Procuring Entity, the Project Manager shall issue a certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works, and less advance payments received up to the date of the certificate.

59. Property

59.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property

of the Procuring Entity if the Contract is terminated because of the Contractor's default.

60. Release from Performance

60.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Procuring Entity or the Contractor, the Project Manager shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterwards to which a commitment wasmade.

SECTION IX - SPECIAL CONDITIONS OF CONTRACT

Except where otherwise specified, all Special *Conditions of Contract should be filled in by the Procuring Entity prior to issuance of the bidding document. Schedules and reports to be provided by the Procuring Entity should be annexed.*

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
	A. General
GCC 1.1 (q)	The Procuring Entity is –***CHIEF OFFICER-PUBLIC HEALTH***
GCC 1.1 (u)	The Intended Completion Date for the whole of the Works shall be **120 (One Hundred & Twenty Days From The date of Commencement.**
GCC 1.1 (x)	The Project Manager is; **The County Chief Officer- Public Works & Transport.** **P.O Box 19-20400 BOMET.**
GCC 1.1 (z)	The Site is located at ***LONGISA WARD-BOMET EAST SUB-COUNTY IN BOMET COUNTY*** and is defined in drawings.
GCC 1.1 (cc)	The Start Date shall be :**AS PER THE CONTRACT COMMENCEMENT DATE**
GCC 1.1 (gg)	The Works consist of; **C*onstruction of the Proposed construction of Dr.Joyce Laboso Memorial Mother and Child wellness Centre.***
GCC 2.2	**The contract / Completion period shall be 24 months.**
GCC 5.1	The Project manager ***[may or may not]*** delegate any of his duties and responsibilities.
GCC 8.1	Schedule of other contractors: **NONE** *[insert Schedule of Other Contractors, if appropriate]*
GCC 9.1	**Key Personnel** GCC 9.1 is replaced with the following: 9.1 Key Personnel are the Contractor's personnel named in this GCC 9.1 of the Special Conditions of Contract. The Contractor shall employ the Key Personnel and use the equipment identified in its Bid, to carry out the Works or other personnel and equipment approved by the Project Manager. The Project Manager shall approve any proposed replacement of Key Personnel and equipment only if their relevant qualifications or characteristics are substantially equal to or better than those proposed in the Bid. **[As per the project manager appointment)**
GCC 13.1	The minimum insurance amounts and deductibles shall be: (a) for loss or damage to the Works, Plant and Materials**: 1,000,000 (One Million Kenya Shillings.** (b) For loss or damage to Equipment: **1,000,000 (One Million Kenya Shillings)** (c) for loss or damage to property (except the Works, Plant, Materials, and Equipment) in connection with Contract **N/A**. (d) for personal injury or death: (i) of the Contractor's employees: **1,000,000 (One Million Kenya Shillings)** *[amount]*. (ii) of other people: **500,000 (Five Hundred Thousand Kenya Shillings)**
GCC 14.1	Site Data are: *[list Site Data]*

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
GCC 20.1	The Site Possession Date(s) shall be **AS PER THE CONTRACT AGREEMENT**
GCC 23.1 & GCC 23.2	Appointing Authority for the Adjudicator: **County Government of Bomet.**
	Hourly rate and types of reimbursable expenses to be paid to the Adjudicator: ***[AS PER THE CONTRACT AGREEMENT].***
B. Time Control	
GCC 26.1	The Contractor shall submit for approval a Program for the Works **within 14 (Fourteen)** days from the date of the Letter of Acceptance.
GCC 26.3	The period between Program updates is **28 (Twenty-Eight)** days. The amount to be withheld for late submission of an updated Program is; **N/A**
C. Quality Control	
GCC 34.1	The Defects Liability Period is**: 180** days.
D. Cost Control	
GCC 38.9	If the value engineering proposal is approved by the Procuring Entity the amount to be paid to the Contractor shall be **N/A** % *(insert appropriate percentage. The percentage is normally up to 50%)* of the reduction in the Contract Price.
GCC 44.1	The currency of the Procuring Entity's Country is: **Kenya Shillings**
GCC 45.1	The Contract *is* ***"Not"*** subject to price adjustment in accordance with GCC Clause 45, and the following information regarding coefficients *[specify "does" or "does not"]* apply. *[Price adjustment is mandatory for contracts which provide for time of completion exceeding 18 months]* The coefficients for adjustment of prices are: (a) *[insert percentage]* percent nonadjustable element (coefficient A). (ib) *[insert percentage]* percent adjustable element (coefficient B). (c) The Index I for shall be *[insert index]*.
GCC 46.1	The proportion of payments retained is: **10% (Ten percent)**
GCC 47.1	The liquidated damages for the whole of the Works are **0.05% per day. The maximum amount of liquidated damages for the whole of the Works is 10% (Ten Percent)** of the final Contract Price.
GCC 48.1	The Bonus for the whole of the Works is **N/A** per day. The maximum amount of Bonus for the whole of the Works is *0%* of the final Contract Price.
GCC 49.1	The Advance Payments shall be: **N/A**
GCC 50.1	The Performance Security amount is **5% (Five Percent)** *of the contract sum* (a) Performance Security – Bank Guarantee: in the amount(s) of *[insert related figure(s)]* percent of the Accepted Contract Amount and in the same currency(ies) of the Accepted

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
	Contract Amount.
E. Finishing the Contract	
GCC 56.1	The date by which operating and maintenance manuals are required is **60 (Sixty) Days from the date of practical completion** The date by which "as built" drawings are required is **60 (Sixty) Days From the date of practical completion.**
GCC 56.2	The amount to be withheld for failing to produce "as built" drawings and/or operating and maintenance manuals by the date required in GCC 58.1 is **5% (Five Percent)**
GCC 57.2 (g)	The maximum number of days is: **20% (Twenty Percent) of the contract period***; consistent with Clause 47.1 on liquidated damages].*
GCC 58.1	The percentage to apply to the value of the work not completed, representing the Procuring Entity's additional cost for completing the Works, **is N/A***]*.

FORM No 1: NOTIFICATION OF INTENTION TO AWARD

This Notification of Intention to Award shall be sent to each Tenderer that submitted a Tender. 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 Intention to Award

   i) Procuring Entity**: *[County Government of Bomet]***
   ii) **Project: *[Proposed construction of Mother and Child Welness Centre]***
   iii) **Contract title: *[CGB/MS&PH/KDSP/001/2021/2022/2023]***
   iv) **Country: *[Kenya]***
   v) 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

   Submit a Procurement-related Complaint in relation to the decision to award the contract.

   a) The successful tenderer

      i) Name of successful Tender_____

      ii) Address of the successful Tender _____

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

   b) 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. For Tenders not evaluated, give one main reason the Tender was unsuccessful.

SNo	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 deadline 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*]

ii) Agency: [*insert name of Procuring Entity*]

iii) 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 info@ppra.go.ke or complaints@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 cannot 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:**___ **Email:** _____

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 of …….20…….in the matter of Tender No……..…of ……..20….. 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 of ……....20…..……

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 hereby accepted by …… (*name of Procuring Entity)*.

You are requested to furnish the Performance Security within 30 days in accordance with the Conditions of Contract, using, for that purpose, one of the Performance Security Forms included in Section VIII, 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 therein,

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

IN WITNESS whereof the parties hereto 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, hereby 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 ……, 2...…[2], and any demand for payment under it must be received by us at the office indicated above on or before that date.

5. The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed *[six months] [one year],* 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.*

[1] *The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, less provisional sums, if any, and denominated either in the currency of the Contract or a freely convertible currency acceptable to the Beneficiary.*

[2] *Insert the date twenty-eight days after the expected completion date as described in GC Clause 11.9. The Procuring Entity should note that in the event of an extension of this date for completion of the Contract, the Procuring Entity would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.*

FORM NO. 9 BENEFICIAL OWNERSHIP DISCLOSURE FORM

INSTRUCTIONS TO TENDERERS: DELETE THIS BOX ONCE YOU HAVE COMPLETED THE FORM

This Beneficial Ownership Disclosure Form ("Form") is to be completed by the successful tenderer. In case of joint venture, the tenderer must submit a separate Form for each member. The beneficial ownership information to be submitted in this Form shall be current as of the date of its submission.

For the purposes of this Form, a Beneficial Owner of a Tenderer is any natural person who ultimately owns or controls the Tenderer by meeting one or more of the following conditions:

- *Directly or indirectly holding 25% or more of the shares.*
- *Directly or in directly holding 25% or more of the voting rights.*
- *Directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Tenderer.*

Tender Reference No.:_____[*insert identification no*]

Name of the Assignment:_____*[insert name of the assignment]* to:

_____*[insert complete name of Procuring Entity]*

In response to your notification of award dated_____*[insert date of notification of award]* to furnish additional information on beneficial ownership:_____*[select one option as applicable and delete the options that are not applicable]*

I) We here by provide the following beneficial ownership information.

Details of beneficial ownership

Identity of Beneficial Owner *[include full name (last, middle, first), nationality, country of residence]*	**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)**

OR

ii) We declare that there is no Beneficial Owner meeting one or more of the following conditions: directly or indirectly holding 25% or more of the shares. Directly or indirectly holding 25% or more of the voting rights. Directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Tenderer.

OR

We declare that we are unable to identify any Beneficial Owner meeting one or more of the following conditions. [If this option is selected, the Tenderer shall provide explanation on why it is unable to identify any Beneficial Owner]

Directly or indirectly holding 25% or more of the shares. Directly or indirectly holding25% or more of the voting rights.

Directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Tenderer]"

*Name of the Tenderer: …….. *[insert complete name of the Tenderer]*

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

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

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

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

SPECIFICATIONS

PAGE SECT-1-A

SECTION B

ARCHITECTS SPECIFICATION

GENERAL

DISCREPANCIES IN DESCRIPTIONS

Descriptions of materials and workmanship contained in the Bills of Quantities measured items shall take precedence over descriptions contained in Appendices in the event of discrepancies between the two, unless the Architect shall otherwise direct.

DISCREPANCIES IN DRAWINGS

Drawings shall take precedence over the Bills of Quantities, for construction purposes, in the event of discrepancies between the two, and the Architect must be notified immediately any such discrepancy becomes apparent.

TESTS AND SAMPLES

Unless otherwise described in the Bills of Quantities, the Contractor will be responsible for all the costs involved in testing materials as described hereinafter. He will also be responsible for all the costs involved in supplying samples of materials or workmanship as required hereinafter to the satisfaction of the Architect. The cost of replacing materials fixed or placed in position which do not comply with the required test results or approved samples shall be borne solely by the Contractor.

KENYA STANDARDS

All materials and goods supplied for incorporation in the works must comply with any relevant current standards issued by the Kenya Bureau of Standards. Where these are not established or are unclear the latest British Standards and Codes of Practice shall be applied.

EXCAVATION AND EARTHWORKS

SITE CLEARANCE

See Structural Engineers Specification.

GRUBBING

See Structural Engineers Specification.

EXCAVATION

See Structural Engineers Specification

WATER IN EXCAVATIONS

The Contractor shall excavate sumps, cut drains, provide and place all necessary materials and provide and work pumps, plant and apparatus for dealing with any water which may find its way into the excavation from any source whatsoever.

The responsibility for draining away, pumping, or otherwise removing water from the excavations shall rest with the Contractor throughout the duration of the Contract, but methods employed shall be subject to the agreement of the Architect.

Prov sion has been made in the Preliminar es and General Conditions of these B lls of Quantities for the Contractor to insert a price against this item.

HARD ROCK

See Structural Engineers Specification

FOUNDATION EXCAVATIONS

See Structural Engineers Specification.

SURPLUS SOIL DISPOSAL

See Structural Engineers Specification.

TOP SOIL FOR SPREADING

See Structural Engineers Specification.

FILLING UNDER SURFACE BED IN BUILDINGS

See Structural Engineers Specification.

FILLING OBTAINED FROM THE EXCAVATIONS

See Structural Engineers Specification.

MATERIALS FOUND IN EXCAVATIONS

See Structural Engineers Specification.

CONCRETE WORK

See Structural Engineers Specification.

WALLING

CEMENT

All cement used for making mortar shall be Portland Cement complying with B.S. 12.

SAND

All sand used for making mortar shall be clean well graded silicone sand of good sharp quality equal to samples which shall be approved by the Architect. It shall be free from lumps of stone, earth, loam, dust, salt, organic matter and any other deleterious substance, sieved through a fine sieve and washed if so directed by the Architect.

LIME

Lime for mortar shall be non-hydraulic or semi-hydraulic quick lime or hydrated lime in accordance with B.S. 890, Class B.

Quick lime shall be run to putty immediately after delivery to site in a pit dug on the site or in approved containers. The water to be first run into the pit or container and

the lime to be added until it is completely submerged and stirred until all lumps are disintegrated and the resulting mild-lime shall then be run through a 3mm square mesh sieve and run into a pit or other container and kept clean and moist for not less than 4 weeks before use.

Hydrated lime shall be added to water in a clean receptacle thoroughly mixed to the consistency of thick cream and allowed to stand and be kept clean and moist for not less than 16 hours before use.

CEMENT MORTAR

The cement mortar (1:3) shall be composed of 42.5 kgs. of Portland Cement to 0.085 cubic metres of sand. The cement mortar (1:6) shall be composed of 42.5 kgs of Portland Cement to 0.17 cubic metres of sand measured in specially prepared gauge boxes and thoroughly mixed in an approved mechanical mixer or mixed dry on clean and approved mixing platforms with water added afterwards until all parts are completely incorporated and brought to a proper consistency. The use or retempering of wholly or partly set mortar will not be allowed.

Foundation walling up to ground floor slab 1 part cement to 6 parts sand.

GAUGED LIME MORTAR

Gauged lime mortar shall be composed of 2 parts by volume of lime putty to 12 parts by volume of sand measured in specially prepared gauge boxes and mixed dry on clean and approved mixing platforms with water added afterwards until all parts are thoroughly incorporated and brought to a proper consistency.

The mortar shall be mixed 7 to 10 days before it is required for use and shall be stacked in a neat heap well smoothed off, covered with wet sacks and allowed to mature.

Immediately before use 1 part by volume of Portland Cement shall be added to 9 parts by volume of lime mortar, the whole being remixed with the addition of extra water until all parts are completely incorporated and brought to a proper consistency.

The gauged mortar must be used within 45 minutes of being mixed and the use or retempering of wholly or partially set mortar will not be allowed.

Above ground floor slab 1 part cement to 3 parts lime to 15 parts sand.

CONCRETE BLOCKS

Concrete blocks shall be hollow or solid as required and shall be hard, true to size and shape with sharp arrises in accordance with B.S. 2028 type 'A'. They are to be obtained from an approved manufacturer and shall be equal in every respect to a sample to be deposited with and approved by the Architect. Blocks must be cured at least 4 weeks before delivery to site and the Contractor is to order his entire stocks as soon as the Contract is signed. Before bulk delivery commences and thereafter, if the Architect so directs, the Contractor shall dispatch twelve sample blocks to the M.O.W. Materials Testing Laboratory. Should tests indicate that the blocks do not comply with the Specification, the batch from which they were taken shall forthwith be removed and re-executed or otherwise rectified at the Contractor's expense. Blocks shall be generally 390mm long, 190mm high and of the thicknesses required for the walling to be built. Blocks of other sizes will, however, be required to form proper bondings at corners, around openings, etc. and the like positions and the Contractor must make or cut blocks to all the varying sizes required for these purposes.

LOAD BEARING CONCRETE BLOCKS

Blocks described as load bearing shall have the minimum compressive strengths specified for each block, determined and tested in accordance with the appropriate B.S. and to the entire satisfaction of the Architect. Blocks of the various strengths shall be differentiated by means of an approved colour code marking.

COLOU ED CONCRETE BLOCKS

Concrete blocks described as coloured shall contain colouring pigment mixed integrally with the materials to produce the required tint or shade. The mix of materials contained in the blocks is to be adjusted as and if necessary to maintain the materials to produce the required tint or shade. The mix of materials contained in the blocks is to be adjusted as and necessary to maintain the specifications of strength etc. Unless otherwise described blocks are to be laid jointed and pointed in mortar containing pigment mixed integrally to produce a tint or shade matching that of the blocks. The mix of materials contained in the mortar is to be adjusted as and if necessary to maintain the specifications of strength, etc.

HOLLOW CLAY BLOCKS

Hollow clay blocks are to be hard, well burnt, true to size and shape with sharp arises and keyed faces and joints in accordance with B.S. 1190 Type 'A'. They are to be equal in every respect with a sample to be deposited with and approved by the Architect. The hollow clay blocks are to be bedded and jointed in gauged mortar.

FAIR FACED CONCRETE BLOCKWORK

Fair faced concrete blockwork shall be built in ordinary blocks selected for their uniformity and appearance and shall be free from holes or any other deformities and shall have clean, sharp arises. The blocks shall be built in mortar as described and raked out and pointed with a neat flush joint as the work proceeds, unless otherwise stated. All arises shall be plumb and square, and all joints properly bonded and true to line.

STONE WALLING

The stone for walling shall be sound and hard throughout free from all defects and shall be obtained from a quarry approved by the Architect. Samples shall be submitted for approval and, if approved, shall be regarded as the standard for the work generally. All stone rejected by the Architect shall be removed immediately from the site. Stones shall be laid on their natural beds and properly lapped and bonded and thoroughly wetted before laying and again after laying for at least three days. Stones shall be chisel dressed into true rectangular blocks with each surface even and at right angles to all adjoining surfaces and shall generally be not less than 390mm long, 190mm high and of the thickness required for the walling to be built. Extra over for fair face shall mean 'fine or medium butched chisel dressed' to an even surface, built with a fair face and raked out and pointed with a neat recessed joint as the work proceeds. All arrises shall be plumb and square and all joints properly bonded and true to line. Fine or medium butched chisel dressed walling shall be in regular courses.

If required by the Bills of Quantities, coloured stone walling and fair face dressings shall be as described below:-

1) Fine butched stone shall be either chisel dressed or machine dressed - dress the external face of each stone to the finest face practically obtainable and finish to a fine rubbed plane surface.
2) Medium butched chisel dressed stone - chisel dress the external face of each stone so that chisel marks are approximately the same width, with ridges between adjacent marks approximately in the same plane.
3) Quarry faced stone - do not work the external face of each stone.
4) Random rubble stone facing - stones of random shape, colour and size as facing to backing wall.

5) R ndom squared medium butched chisel dressed stone - stones of random shape, colour, size and thickness squared and dressed as before described.
6) Stone walling of approved colour - walling to be built using grey and mixed blue and grey coloured stones.
7) Stone walling of variegated colours - walling to be built using multi colour stone approved by the Architect and mixed in proportions approved by the Architect.
8) Machine dressed stone facing shall be 25mm or 50mm thick as required by the Architect. Machine rotary blade cut stones facing on backing wall.

The finished mortar joint for fine or medium butched chisel dressed stonework is to be 10mm wide and generally 5mm back from the face of the stone. Where directed by the Architect the mortar will be coloured to match the stones.

Stone walling described as load bearing shall have a minimum crushing strength of 10 Newtons per square mm.

On completion all stonework is to be scrubbed down with a wire brush.

BRICK FACINGS

Brick facings shall be of hand scratched bricks size 65mm high x 65mm deep x 230mm long as manufactured by Clayworks Ltd., P.O. Box 48202, Nairobi, with 10mm horizontal joints only raked out 10mm deep as the work proceeds. Wall ties shall be 18 gauge butterfly shaped galvanised mild steel wire staggered at 450mm centres vertically and 900mm centres horizontally. Supports at heads shall be with approved steel angles. Strict supervision of quality will be maintained by the Architect and all work will be in accordance with a sample panel to be approved by the Architect prior to the start of facing works.

WALLING GENERALLY

The Contractor shall provide proper setting out rods and set out all work on same for courses, openings, heights, etc., and shall build the walls, piers, etc., to the widths, depths and heights indicated on the drawings.

Concrete blocks shall be thoroughly wet before being laid and shall be kept wet during that day. Where unfinished work is continued, the completed walling shall be wetted before laying mortar.

All walls throughout the work shall be carried up evenly in 200mm courses, no part being carried up more than 1m higher at one time than any other part, and in such cases the jointing shall be made in long steps so as to prevent cracks arising, and all walls shall be levelled round at each stage. All faces of walls to be plastered are to have all the joints raked out as key for plaster.

Alternate courses of walling at all angles and intersections shall be carried through the full thickness of the adjoining wall. All walling shall be built up entirely solid in blocks, without voids. All perpends, reveals and angles of the walling shall be built strictly true and square and all walling shall be flushed up and grouted solid as the work proceeds.

All putlog holes shall not be less than one course deep and carefully filled with a block cut to fit size of opening with beds and joints filled with mortar well tamped in after scaffolding is removed and if in fair faced wall to match facings.

All walling 200mm thick and under is to be reinforced with one layer of 25mm x 16 B.W.G. hoop iron built into every second course well lapped at joints and intersections and carried at least 115mm into abutting walls at junctions.

Where concrete and stone walling are bonded together at intersections or heading joints the horizontal cement mortar beds shall not exceed 15mm thickness and vertical joints are to be staggered.

DAMP PROOF COURSES

The damp proof course is to consist of a 25mm screed of cement and sand (1:2) laid over the area of the walls and finished to a level surface and covered with and including an approved fibre based bituminous damp proof course weighing not less than 2.7 kgs. per square metre and lapped 225mm at all joints and intersections. All walls are to be carefully cleaned and wetted before the screed is laid.

OTHER TRADES

Close co-operation with electrical and plumbing Sub-Contractors must be maintained from the beginning of the job to avoid chases being cut in hollow block or 100mm solid block work or across any fair faced work. If necessary, conduits should be run down the jambs of the door openings behind the door frame and taken to the switch position through a horizontal joint in the masonry.

ROOFING

SCREEDS

Roof screeds where specified shall be as described in 'Floor, Wall and Ceiling Finishes'.

GUARANTEE

The Contractor and the Roofing Sub-Contractor are to leave all the roofs complete and watertight, unmarked with cement or bitumen particularly flashings and external finishes and with joints in straight and even lines.

The Contractor must submit to the Employer a ten year guarantee for the roof coverings against leakage. If a Sub-Contractor is to execute the roofing the Contractor is responsible for obtaining this guarantee for them for submission to the Employer.

ALUMINIUM EMBOSSED CAP SHEET ROOF COVERING

The cap sheet covering shall be Cabro 42 S.W.G. aluminium embossed cap sheet covering with underlayers of saturated felt, as manufactured by Cabroworks Ltd., P.O. Box 98567, Mombasa, and laid by an approved Sub-Contractor in strict accordance with the manufacturer's printed instructions.

MASTIC ASPHALT ROOFING

All asphalt roofing shall be manufactured and applied in accordance with B.S. 988 Mastic Asphalt for Roofing (Limestone Aggregate). Proportions of component ingredients shall be generally within the limits laid down in the B.S. but the ratio of bitumen to Lake asphalt shall be appropriate for use in tropical climates. The asphalt shall be applied in two coats each of 10mm thickness laid to the falls formed in the screeds, by an approved Sub-Contractor.

The first coat of all horizontal work shall be laid on a single layer of black sheathing felt complying with B.S. 747, Table 4A (i) laid and lapped in accordance with the manufacturer's instructions. Rates for asphalt shall include for underlay.

All vertical surfaces, tops of parapets, gutter sides and bottoms shall be finished with one coat of bituminous aluminium paint. All other surfaces shall have a 12mm layer of black trap chippings graded from 6 - 12mm, laid loose.

MASTIC ASPHALT TANK NG

All asphalt tanking shall be manufactured and applied in accordance with B.S. 1097 by an approved Sub-Contractor.

GALVANISED CORRUGATED IRON SHEETING

Roof sheeting and accessories shall be pre-painted galvanised steel as manufactured by Galsheet Kenya Ltd., P.O. Box 78162, Nairobi, and fixed strictly in accordance with their printed instructions and generally in accordance with international standards.

ROOFING TILES

The roofing tiles shall be as specified, of approved quality and manufacture, uniform in size, shape and colour, free from twist or other defects to be obtained from an approved manufacturer, supplied and fixed in accordance with the manufacturers specifications and recommendations.

The ridge and hip shall be socketed tiles of approved quality, shape and manufacture, to match the roofing tiles in colour with rebated joints and free from twist and other defects.

The roofing tiles shall be hung on timber/concrete battens and shall be laid to accurate gauge and each roof shall be set out to take an exact number of tiles without cutting.

Hip and ridge tiles to be bedded and jointed in cement mortar (1:4) and pointed at joints and ends and intersections in coloured cement to match colour of tiles. All angles and intersections shall be neatly cut and rubbed to form a close joint.

CARPENTRY, JOINERY AND IRONMONGERY

QUALITY OF TIMBER

The qualities of timber stated hereinafter are to be in accordance with the Grading Rules (Third Edition) dated 8th April, 1959, approved by the Forest Department of Kenya.

All timber described as 'Sawn Podocarpus' shall be Second (Select) Grade Sawn Podocarpus Gracilior.

All timber described as 'Sawn Cypress' shall be Second Grade Sawn Cupressus

All timber described as 'Wrot Cypress' shall be F rst (Prime) Grade Wrot Cupressus.

All timber described as 'Wrot Cedar' shall be First (Prime) Grade Wrot Red Cedar (Juniperus Procera).

All timber described as 'Wrot Meru Oak' shall be First (Prime Grade Wrot Meru Oak).

All timber described as 'Wrot Camphor' shall be First (Prime) Grade Wrot Camphor specially selected for straight grain and colouring. No joinery work is to be put in hand until the Architect has seen and approved the colour and grain of the timber.

Where hardwood is specified it shall be Mvuli, Mahogany, Mninga, Camphor, Rosewood, Blackwood or Meru Oak as selected by the Architect at the letting of the contract and all tenders will be deemed to have allowed for this.

When employed for carpentry work the above timbers shall be well seasoned to a moisture content not exceeding 18% of the dry weight.

When employed for joinery work the above timbers shall be well seasoned to a moisture content not exceeding 6% of the dry weight.

GENERALLY

All timber for permanent work in the buildings shall before use, be dry and be approved by the Architect for quality in accordance with the foregoing specification for its respective grade. All structural timber shall be in accordance with C. P. 112.

All Carpenter's work shall be left with sawn surfaces unless particularly specified to be wrot. Scantlings and boarding shall be accurately sawn and shall be left uniform in width and thickness throughout. All Carpenter's work shall be accurately set out together and securely fixed in the best possible manner with properly made joints. Provide all brads, nails, screws, bolts, etc. as necessary. Nails shall comply with B.S. 1202 and bolts with B.S. 916.

Knotting shall comply with B.S. 1336

Variations from specified dimensions of scantling shall not exceed the tolerance stated in the aforementioned Grading Rules. Boards 25mm thick or less shall hold up to the specified sizes. All timber shall be as long as possible and practicable to eliminate joints.

Ends of timbers required to be built into walls shall have 12mm space between same and walling. All ends of timbers to be strapped with hoop iron and primed.

All Joiner's work shall be wrot unless otherwise specified.

All mouldings shall be accurately run and finished and all arrises shall be slightly rounded. Framed work shall be cut out, properly tenoned, shouldered, etc., and framed together as soon after the commencement of the works as is practicable but should not be wedged up until required for fixing in position and any portions that warp, get in winding, develop shakes or other defects shall be replaced with new. As soon as required for fixing in position the framing shall be glued together with best quality glue and properly wedged or pinned, etc., as described.

Unless otherwise described oval or round brads will be used for fixing all face work, all heads shall be properly punched in. Where described as pellated work shall be countersunk screwed and the screw heads covered with timber pellets to match the adjacent timber.

Should any of the Carpenter's or Joiner's work shrink, warp, wind or develop any other defects within six months after the completion of the works, the same shall be

remo ed and new fixed in its place together with all other work which may be affected thereby, all at the Contractor's cost and expense.

INSECT DAMAGE

All timber, whether graded or ungraded, and including shuttering, scaffolding and the like shall be free of live borer beetle or other insect attack when brought upon the site. The Contractor shall be responsible up to the end of the maintenance period for executing at his own cost all work necessary to eradicate insect attack to timber which becomes evident including the replacement of timbers attacked or suspected of being attacked, notwithstanding that the timber concerned may have been inspected and passed as fit for use.

DIMENSIONS

(a) Timber not specified to be wrought shall be as from the saw and full to the nominal dimensions stated. No undersizes shall be permitted but oversize to the following tolerances may be allowed:-

(i) 1.5mm oversize on dimensions up to 25mm

(ii) 3mm oversize on dimensions up to 50mm

(iii) 6mm oversize on dimensions over 50mm.

(b) Where 'nominal' dimensions are stated for wrot timber a tolerance of 3mm shall be allowed for each wrot face.

Before putting in hand any joinery work, whether built-in or fixed later, the joiner is to ascertain and check on site all dimensions which affect or govern the joinery work.

PRESERVATION OF TIMBER

All timber described as impregnated shall be vacuum pressure impregnated with Tanalith or Celcure preservative in accordance with Specification No. 1/56 (Buildings) for the Vacuum/Pressure Impregnation of Timber with Hickson's 'Tanalith' wood preservative issued by Hickson's Timber Impregnation Co. (G.B.) Ltd., or other approved source. Where timber is cut or bored after impregnation the exposed surfaces are to be liberally swabbed with Wolmanol.

SPECIES OF TIMBER

Only those timbers specified in these Bills of Quantities are to be used for the works, unless alternatives are authorised by the Architect.

SEASONING OF TIMBER

All carpentry timbers are to be seasoned to a moisture content of not more than 18% of the dry weight. All joinery timbers are to be seasoned to a moisture content of not more than 6% of the dry weight. The Contractor is to make available on site a meter for testing moisture content of all timber delivered.

PREPARATION AND PROTECTION OF TIMBER

(a) All timber necessary for the works is to be purchased immediately the Contract is signed, and when delivered is to be open stacked for such further seasoning as may be necessary. Preparation of the timber is to be commenced simultaneously with the commencement of the works generally.

(b) All timber and assembled woodwork is to be protected from the weather and stored in such a way as to prevent attack by decay, fungi, termites or other insects.

CLEARING UP

The Contractor is to clear up and destroy or remove all cut-ends, shavings and other woodwaste from all parts of the buildings and the site generally as the work progresses and at the conclusion of the works.

TIMBER IN MASONRY, ETC.

Ends of timber built into walls shall be thoroughly brush treated with creosote or other approved preservatives and clean air space maintained around the timbers where they adjoin the walls.

PRIMING WOODWORK

All woodwork which is to be painted or hidden from view, backs of door frames, etc. are to be primed and painted one coat before fixing. Allow for touching up priming during progress of works.

JOINTING

(a) All joints must be made as specified or detailed and the execution of all jointing shall be to the satisfaction of the Architect.

(b) Joining surfaces of all connections exposed to the weather are to be thickly primed except where glueing is specified. Surfaces are to be in good contact over the whole area of the joint before fastenings are applied.

(c) No nails, screws or bolts are to be placed in any end split. If splitting is likely or is encountered in the course of the work, holes for nails are to be pre-bored at diameters not exceeding 4/5ths of the diameter of the nails. Clenched nails must be bent at right angles to the grain. Lead holes are to be bored for all screws.

(d) Where the use of bolts and washers are specified the holes are to be bored from both sides of the timber and are to be a diameter D + D/16 where D is the diameter of the bolt. Nuts must be brought up tight but care is to be taken to avoid crushing of the timber under the washers.

(e) Joints in joinery must be as specified or detailed and so designed and secured as to resist or compensate for any stresses to which they may be subjected. All nails, sprigs,etc., are to be punched and puttied.

(f) Loose joints are to be made where provision must be made for shrinkage, glued joints where shrinkage need not be considered and where sealed joints are required. All glued joints shall be crosstongued or otherwise reinforced.

(g) Glues for load-bearing joints or where conditions may be damp must be of the resin type. For non-load-bearing joints, or where dry conditions can be guaranteed, casin or organic glues may be used.

JOINERY

(a) All joinery shall be accurately set out on boards to full size for the information and guidance of artisans with all joints, ironwork and other works connected therewith fully delineated. This setting out shall be submitted to the Architect and approved before the work is commenced.

(b) All joinery shall be executed with workmanship of the best quality in strict accordance with the detailed drawings. All mouldings, shall be accurately and truly run and all work planed, sand-papered and finished to the approval of the Architect.

(c) All framed work shall be cut out, properly tenoned, shouldered etc., and framed together as soon after the commencement of the building as is practicable but shall not be wedged up until th building is ready for fixing the same and any portions that

warp wind develop shakes or other defects shall be replaced with new. As soon as required for fixing in the building the framing shall be glued together and properly wedged or pinned, etc., as directed.

(d) Should any of the joinery shrink, warp, wind or develop any other defects within the maintenance period specified in the Contract the same shall be removed and new fixed in its place together with all other work which may be affected thereby. All at the Contractor's expense.

TOLERANCE

Reasonable tolerance shall be provided at all connections between joinery works and the building carcass, so that any irregularities, settlement or other movements shall be adequately allowed for.

SCRIBING

All cornices, architraves, frames and other joinery works shall be accurately scribed to fit the contour of any irregular surfaces against which they may be required to form a close butt connection. In particular, architraves are to be cut to fit against side walls and maintain proper mitres at top corners.

SHRINKAGE

The arrangement, jointing and fixing of all joinery shall be such that shrinkage in any part and in any direction shall be compensated for and not impair the strength or appearance of the work or cause damage to adjacent structures

VENEERS

All veneers are to be specially selected for grain and colouring and no veneered work shall be put in hand until the Architect has approved the sample of grain and colour.

NATURAL FINISH

When natural finish is specified, the timber in adjacent pieces shall be matched and uniform or symmetrical in colour and grain. The surface finish is to be as specified.

FLUSH DOORS

Flush doors shall be 3mm plywood faced doors with solid or semi-solid cores, in accordance with B.S. 459 Part 2, obtained from a manufacturer approved by the Architect and equal in every respect to a sample to be submitted to and approved by the Architect. Doors shall be lipped with hardwood strips on all edges and shall be finished for painting on both faces unless otherwise stated. Plywood for use on external doors shall be of exterior grade as described later.

The proportion of solid area in semi-solid doors shall not be less than 50% of the total and shall be evenly distributed throughout the door.

CHIPBOARD

Chipboard shall comply in all respects with B.S. 2604 for medium density resin bonded wood chipboard and shall be veneered or not as shown on the drawings and as described in the Bills of Quantities. Chipboard of non-British origin shall comply with the tests enumerated in the said B.S. and samples shall be submitted to the Architect for this purpose and for his approval.

BLO KBOARD

Blockboard is to be of approved quality, solid and glued throughout. Where described as faced it shall be faced with an approved veneer of the timber specified.

PLYWOOD

Plywood shall be in accordance with B.S. 1455 and shall be of second grade and that for use externally shall be of external grade conforming at least to Clause 138 of the B.S.

HARDBOARD

Hardboard shall be oil-tempered or otherwise as specified of the thicknesses specified and is to be glued and fixed with the special hardboard nails supplied by the manufacturer. Sheeting is to be wetted the day before fixing. All sawn edges to be carefully sandpapered.

SOFTBOARD

The softboard is to be of approved quality and manufacture, fixed with galvanised clout nails or an approved adhesive as necessary, or both as specified.

PLASTIC LAMINATE

Plastic laminate shall be as manufactured by Formica Ltd. or other equal and approved and shall be worked and fixed strictly in accordance with the manufacturer's instructions with the adhesive recommended by the manufacturer. Colours shall be selected by the Architect from samples to be submitted early in the Contract.

PLUGS

All plugs described as fixing for joinery etc., shall be approved plugs such as Rawlplugs or Philplugs set into holes drilled in masonry in accordance with the manufacturer's instruction. No wooden plugs are to be used.

PROTECT JOINERY

Any fixed joinery which is liable to become bruised or damaged in any way shall be properly cased and protected by the Contractor until the completion of the works.

SITE DIMENSIONS

Before putting in hand any joinery work, whether to be built in with the carcass or fixed later, the joiner is to ascertain and check all dimensions on the site which affect or govern joinery work.

BILLS OF QUANTITIES DIMENSIONS

All wrot timber dimensions given in the Bills of Quantities are finished sizes unless otherwise stated.

IRONMONGERY

The Contractor is to check consignments of ironmongery upon receipt and store them in safe keeping until required for fixing.

All ironmongery shall be fitted and fixed in accordance with the manufacturer's instructions. Rates for fixing are to include for all cutting, sinking, boring, morticing and fitting in hardwood or softwood and for supplying all necessary and matching screws. Rates for door furniture shall also include for fixing before painting, removal during painting operations and afterwards fixing and for labelling all keys with door references and handing to the Architect upon completion.

All locks, springs and other items of ironmongery with movable parts shall be properly tested, cleaned and adjusted where necessary and left in perfect working order upon completion of the works by the Contractor who shall include for this in his prices for fixing.

GENERALLY

All pencil marks are to be removed before oiling or varnishing joinery work. Leave all joinery work perfect and clean without nail holes; clean up all waste and protect finished work from staining or damage. Oil all locks and adjust to give a perfect fit and leave clean.

METAL WORK

GENERALLY

All materials shall be of the best of their respective kinds and conform at least to the relevant B.S. where such exists. All work shall be carried out strictly as directed and approved by the Architect before fixing.

WELDING

Welding shall comply with the provisions of B.S. 538.

MILD STEEL

Shall be of approved manufacture complying with the requirements of B.S. 15. Welding to comply with the requirements of B.S. 538, 938 and 1856. Screws, bolts, washers, etc., to comply with the requirements of B.S. 916 and 1494.

GALVANISED STEEL SHEET

Shall be of approved manufacture, free from all defects and shall hold up to the gauge specified. Galvanising shall be to B.S. 729 Part 7.

BOLTS AND SET SCREWS

All bolts to be the best screw bolts with hexagonal heads and nuts and round washers.

Set screws to be similar but with circular flat slotted head for screwing or with round countersunk slotted head, similar to a wood screw, the threaded end suitable for screwing into tapped steel to the required depth.

ALUMINIUM

Aluminium sheet shall comply with the requirements of B.S. 1470 and be suitable for the purpose required.

Extruded aluminium sections shall be obtained from an approved source and be equal to samples to be submitted to and approved by the Architect. The surface finish shall be matt.

HOOP IRON.

Provide 25mm wide 24 gauge hoop iron reinforcement and anchors to be laid where specified under masonry, and anchored in ring beams.

PRICING INFORMATION

Prices for all welded work shall include for preparing, welding and grinding to a smooth finish.

FLOOR, WALL AND CEILING FINISHES

GENERALLY

The whole of the plasterwork and other wall, floor and ceiling finishes shall be executed to the entire satisfaction of the Architect and any work rejected shall be taken down and re-executed by the Contractor at his own expense. All scaffolding, temporary rules and screeds, tools or special appliances required shall be furnished by the Contractor.

CEMENT

Shall be as described in 'Walling'

LIME

Shall be as described in 'Walling'

SAND

Shall be as described in 'Walling'

WATER

Shall be as described in Structural Engineers Specification.

WORKMANSHIP

All concrete beds or slabs shall be thoroughly brushed, cleaned, hacked if necessary and well wetted and flushed over with a cement and sand (1:1) grout immediately before screeds or pavings are laid.

Screeds and cement pavings shall be laid in accordance with the relevant B.S. Code of Practice and in alternate bays generally not exceeding 3m x 3m with neat butt joints and shall be damp cured with sand or sawdust and kept damp for at least 7 days after laying.

Adequate time intervals must be left between successive coats in two coat work in order that the drying shrinkage of the under-coat may be substantially complete. All internal and external angles shall be pencil rounded.

BOARD MARKED FINISH

Board marked finish is to be provided where shown on the drawings and shall be priced against the formwork item of 'Extra over formwork for board marked finish'.

The shuttering boards shall be heavily grained knotty cypress, or similar and approved, well seasoned and free of wind and shakes. The boards shall be in 100mm widths fixed vertically or horizontally as directed. The edges shall be butt jointed to maintain a flat surface. Unless otherwise approved, boards shall have a maximum of four uses and between each use shall be carefully cleaned from adhering grout and lightly oiled with an approved non-staining mould oil.

Every care and attention shall be paid to obtaining and maintaining throughout the course of the works a satisfactory visual appearance, free from blow holes, hungry patches and other blemishes and uniform in colour and texture.

Construction joints shall be as shown on the drawings or otherwise the pour each day shall be as directed by the Engineer.

Samples panels will be required for approval of the Engineer before work commences.

The granolithic topping is to be 15mm thick and shall consist of one part coloured cement to two parts aggregate to 6mm gauge mixed with 15% fine dust. Aggregate is to be 70% black trap and remainder approved local coloured stone. Colours shall be as selected by the Architect. Paving is to be rolled and trowelled to a dense even surface and rubbed down at completion to a grit finished surface free from holes and blemishes. The paving is to be laid in squares divided by plastic strips anchored securely in the screed and having their top edges level with the finished floor surface. The granolithic work is to be laid and polished complete to the approval of the Architect. The screed between the granolithic topping and the concrete floor is to be cement and sand (1:3), laid by the Sub-Contractor.

The Contractor is to twice scrub the topping with soap and water before twice wax polishing and handing over.

MARBLE

Marble floor paving or wall cladding shall be compact and dense with a density of 2700 Kg/m3 as manufactured by Athi River Mining Ltd., P.O. Box 41908, Nairobi or other equal and approved, fixed in accordance with BS CP 298:1972 and manufacturer's instructions all to the Architect's approval. For floor paving, marble must be hardwearing and non-slip.

The marble supplier shall prepare fully dimensioned drawings from details supplied by the Architect and from site survey. Key numbers of each store shall be shown, together with details of all metal anchorages. No marble shall be fixed/laid until these drawings are approved by the Architect and the Contractor and local authority if necessary.

Exposed surfaces shall be finished in accordance with an approved sample.

Cramp holes and mortices shall be carefully drilled or cut to avoid stunning or fracture of the material adjacent to the hole or mortice.

The fixing cramps shall be adequately inset into the supporting background, preferably with under cut dowel holes and grouted in (1:3) cement/sand mortar, or other equal and approved epoxy/polyester resin mortars. A cavity between cladding and backing of 20mm minimum should be maintained except where dabs of weak mortar or lime putty are required to position the slabs. The back of slabs shall be coated with "shellac" or other equal and approved paint.

Metal anchorage shall be made from suitable non-ferrous metal and shall be of such size and dimension adequate to support loads imposed on them.

The length and height dimensions of individual dimension of slabs shall be $\pm$ 1mm of the specified sizes. Thickness shall be within 3mm from that specified except on the exposed ends.

Internal wall cladding shall be fixed with tight joints and external cladding shall have 3mm joints. All joints to be filled with coloured cement and sand mortar to match marble. Paving shall be bedded solid on cement and sand screed.

The whole of marble work is to be executed by an approved Sub-Contractor.

QUARRY TILES

Where indicated lay approved clay quarry tiles bedded in cement. Joints to be 10mm wide and slightly recessed pointed in pigmented cement colour to match colour of quarry tiles to the approval of the Architect. Quarry tiles are to be laid as skirtings to these areas. Cement must not be smeared over the face of the tiles which must be selected for variety of colour and evenness of size.

VINYL ASBESTOS FLOOR TILES

Vinyl asbestos floor tiles shall be of the thickness specified as manufactured by Dunlop Kenya Ltd., or other equal and approved, and of colours to be selected by the Architect and shall be bedded in suitable mastic to a square pattern.

The whole of the floor tiling is to be executed by an approved Sub-Contractor.

Screeds must be perfectly smooth level clean and dry before laying commences and tiling must be laid strictly in accordance with the manufacturer's instructions. Tiles shall comply with B.S. 3260 and 3261 respectively. Prices shall include for giving the floor coverings two coats of an approved emulsion wax floor polish or other approved protective coating.

PARQUETRY

Parquetry is to be 8mm thick on building paper or similar backing bedded in hot bituminous mastic. After laying remove backing paper, sand to a smooth surface and finish with three coats of Polyurethane matt clear sealer.

The whole of the parquetry is to be executed by an approved Sub-Contractor. Screeds must be perfectly smooth level clean and dry before laying commences and parquetry must be laid strictly in accordance with the manufacturer's instructions.

DIVIDING STRIPS

Dividing strips shall be 3mm thick and of a similar height as the paving in which they are embedded. Strips shall be cut to lengths and embedded in the pavings to form margins or bays to a detailed pattern or between differing floor finishes.

Prices for dividing strips are to include all necessary cutting required to ensure a flush level surface with the paving.

NON-SLIP POLISHED PAVINGS

Where pavings are described as non-slip they shall have carborundum dust sprinkled evenly over the surface at the rate of one kilogram per square metre lightly trowelled in whilst still green.

LIGHTWEIGHT SCREEDS

Lightweight screeds shall be composed of cement, sand and approved lightweight vermiculite (1:4:8) finished with a minimum 12mm thickness of cement and sand (1:5) laid whilst the base course is still green and trowelled smooth to the satisfaction of the roofing or flooring Sub-Contractor. Alternatively an approved pumice aggregate screed may be used to the approval of the Architect.

The Architect reserves the right to delete the lightweight screeds from the Contractor's work and to order their execution by a Nominated Sub-Contractor. No claim for loss of profit will be entertained in this eventuality.

DUST PROOFING COMPOUND

Concrete surfaces to be dust proofed shall have two coats of Sealocrete Concrete Surface Dressing applied in accordance with the manufacturer's instructions.

PLASTERING AND RENDERING GENERALLY

All surfaces to be plastered or rendered shall be brushed clean and be well wetted before plaster is applied. All plaster and rendering shall be kept continuously damp for seven days after application. All arrises shall be finished true and slightly

rounded except where otherwise stated, and shall be run at the same time as the adjoining plaster. No partially or wholly set plaster or rendering will be allowed to be used or re-mixed.

The Contractor shall prepare samples of the plastering and rendering as directed until the quality, texture and finish required is obtained and approved by the Architect after which all plastering executed in the work shall conform to the respective approved samples.

The Contractor shall cut out and make good all cracks, blisters and other defects and leave the whole of the work perfect on completion. When making good defects, the plaster or rendering shall be cut out to a rectangular shape with edges undercut to form dovetailed key, and all finished flush with face of surrounding plaster or rendering.

Rates for plastering and rendering are to include for raking out joints of walling or hacking concrete to form a key. Instead of hacking the Contractor will be permitted to treat concrete surfaces, at his own expense, with bonding fluid, such as 'Plastaweld' manufactured by I. Manger and Son Ltd., or other equal and approved applied in strict accordance with the manufacturer's printed instructions.

INTERNAL PLASTER

Internal plaster shall be applied in two coats as follows, overall 12mm thick unless otherwise described:-

(a) 9mm First coat consisting of cement, and sand (1:4) well scratched, wetted and keyed to receive finishing coat.

(b) 3mm Finishing coat consisting of cement and lime putty (1:5) skim coat finished with a steel trowel to a smooth and even surface. Adequate time intervals must be left between successive coats in order that the drying shrinkage of the under coat may be substantially complete. All internal and external angles shall be pencil rounded.

EXTERNAL RENDERING

External rendering shall consist of cement and sand (1;3) applied in one coat and finished with a wood float as specified. Unless otherwise described rendering is to be 12mm thick applied in one coat. Rendering described as 20mm thick or over shall be applied in two coats.

TYROLEAN RENDER

Tyrolean render shall be composed of Colocrete or Snowcrete coloured or white cement and a special aggregate supplied as Cullamix and mixed in the proportion of two and a quarter to two and a half parts Cullamix to one part water applied with an approved hand operated machine. A finished thickness of 6mm should be obtained in stages until the crisp texture is obtained completely obliterating the background surface and as approved by the Architect. An equivalent made-up mixture with an approved aggregate similar to Cullamix may be used with the Architect's approval.

JOINTS

At junctions of structure frame and panel walling, cut through the entire thickness of plaster with a trowel leaving a gap of not more than 1mm width.

CRACKS AND DEFECTS

The Contractor shall cut out and make good all cracks, blisters and other defects and leave the whole of the plastering and rendering perfect at completion. When making good defects the plaster shall be cut out to a rectangular shape with edges

undercut, to form dovetailed kay, and all finished flush with the face of the surrounding plaster.

BAGGING

All internal and/or external surfaces specified as bagged are to be treated with a complete covering of 1:4 liquid cement/sand wash thoroughly rubbed in with an old sack to fill all cavities.

CERAMIC TILES

Ceramic tiles shall be from an approved manufacturer, and shall conform with the requirements of B.S. 1281. Tiles shall be of standard quality and unless otherwise specifically described shall be size 200 x 250 x 6mm thick for walls and 200 x 200 x 8mm thick for floors. Tiles shall be laid with continuous 2mm wide straight joints with plastic spacers and internal angles shall be butt jointed. Plastic edge beads shall be used at all external angles and at edges of panels. Tiles shall be well soaked in water, bedded in approved tile adhesive, pointed in white cement, and cleaned and polished on completion.

SAMPLES

The Contractor shall without charge prepare samples of work as directed until the quality, texture and finish required are obtained and approved by the Architect, after which all work executed shall conform to respective approved samples.

APPROVED SUB-CONTRACTORS

The Contractor shall state on the form provided and included as a tender document, the names of the Sub-Contractors he proposes to employ, and he shall not employ any other Sub-Contractors for the work without the written permission of the Architect.

PRICING INFORMATION

Prices for paving, beds and screeds shall include for the preparation of the concrete floor and painting with cement grout, as described; for any extra thickness consequent upon the concrete floor not being finished to true levels; and for laying over electrical conduits including reinforcing as necessary to the approval of the Architect.

Prices for plastering and rendering shall include for the preparation of the surfaces including raking out joints of brickwork or blockwork and hacking surfaces of concrete to form key, and for any extra thickness or dubbing out consequent upon any irregularities or inaccuracies in the surfaces to be covered.

Prices for terrazzo and granolithic work shall include for beds and backings, executing in the colours selected by the Architect, laying to panels and designs as may be directed, and for polishing at completion. Dividing strips forming panels and designs will be measured and paid for separately.

Prices for external finishings shall include for executing work at any height above ground and for any necessary additional scaffolding, ladders, cradles, etc.

If required by the Architect, or if indicated on the drawings prices for internal plastering and external rendering shall include for forming a fair splayed edge at all junctions with fair faced concrete surfaces and for forming 12mm wide grooves with fair splayed edges at junctions of walls with structural members and at soffits of slabs etc. Prices shall also include for V-grooves or rounded grooves, not exceeding 12mm wide, in external rendering to form decorative panels.

Prices for beds and backings are to allow for a true and even finish with a steel float, which is to be scraped clean by the Contractor before receiving the finish, to the satisfaction of the finishing Sub-Contractor.

PROTECTING FLOOR FINISHINGS

The Contractor is to allow for protecting all floor and staircase finishings after laying, whether executed by himself or a Sub-Contractor and will be held responsible for any damage to the finishings after laying. All floors are to be cleaned on completion of the building before handing over.

GENERALLY

Protect all fittings, joinery and finishings from plaster and other finishings and clean up all marks on completion.

GLAZING

GENERALLY

All glass shall be of approved manufacture in accordance with B.S. 952, and free from flaws, bubbles, specks, and other imperfections cut to size to fit the opening for which it is required with not more than 1.6mm tolerance all round. All glass to be delivered in proper containers with maker's name, guarantee, type of glass and thickness or weight of glass attached to the outside of the container.

The clear sheet glass shall be Ordinary Glazing (O.Q.) quality sheet glass.

The obscured glass shall be of a pattern approved after the Contractor has submitted samples to the Architect at the beginning of the Contract.

Tempered glass shall be of the thicknesses specified.

The putty for glazing shall be tropical putty of approved manufacture suitable for glazing to metal or wood frames as hereinafter specified.

All putty shall be delivered on site in the original manufacturer's sealed cans or drums. The putty is to be removed from the drum well kneaded with the minimum of linseed oil and left for 24 hours before using.

The rebates and backs of handle brackets to metal windows shall be painted one coat before puttying. Before glazing the rebates of all windows shall be adequately back puttied.

Within 14 days the putty must dry and harden without wrinkling of the surface or caking and shall adhere satisfactorily to the surface of the glass and the frame.

The washleather strip shall be approved by the Architect and shall be cut to fit the exact line of bead.

The wires of Georgian wired glass, in adjacent panes, are to align both ways.

PRICING INFORMATION

Prices for glass shall include for all cutting and glazing to frames as described.

PAINTING AND DECORATING

GENERALLY

The whole of the work shall be executed to the entire satisfaction of the Architect, and all work rejected is to be re-executed by the Contractor at his own expense.

Subject to the foregoing, the methods of application adopted i.e. brush, spray, roller, etc. are at the discretion of the Contractor, unless otherwise described.

All paints shall be Grade A in accordance with the Ministry of Works approved paint list.

Sumps and drains shall not be used for the disposal of waste or dirty water.

MAINTENANCE

The Contractor shall make good after other trades have carried out maintenance work. In cases where the defective work is not caused by, or the responsibility of, the Contractor, or his Sub-Contractors, he should make arrangements for payment with the party concerned. Where cracks have been made good, apply two coats to the new filling and one coat to the whole wall in which the crack has appeared.

MATERIALS

Any deviation from the materials and makes specified must be approved in writing by the Architect to whom application must be made before decoration starts.

IRONMONGERY

All ironmongery already fixed is to be removed before painting doors and refixed on completion of the finishing coat. If any paint should get on to ironmongery, it must be removed with chemical solvents and not scratched off.

APPROVED SUB-CONTRACTORS

The Contractor shall arrange for the painting and decorating work to be executed by an approved Sub-Contractor. The Contractor shall state on the form provided and included as a tender document the name of the Sub-Contractor he proposes to employ and he shall not employ any other Sub-Contractor for the work without the written permission of the Architect.

MIXING

All materials shall be delivered on site intact in the original containers and shall be mixed and applied strictly in accordance with the manufacturer's printed instructions. No addition will be allowed to be made locally without the express permission of the Architect.

COLOURS

The priming, undercoats, and finishing coats shall each be of differing tints, the priming and undercoats shall be the correct brands and tints to suit the respective finishing coats, in accordance with the manufacturer's instructions. All finishing coats shall be of the colour and type specified by the Architect.

The Contractor will be required to paint trial panels and will be required to adjust tints as necessary.

AREAS TO BE READY FOR PAINTING ETC.

Before the painting or decorating is started the Contractor shall arrange that all other trades have been completed and other tradesmen removed from the vicinity of the area to be painted. All plaster, mortar, concrete, oil or stains of any kind shall be removed by the Contractor from work to be decorated before painting commences.

PREPARATION

Plastered and rendered surfaces to be decorated shall be allowed to dry for a minimum of four weeks before decoration commences.

Plaster finished with a steel trowel and fair face concrete surfaces shall be well rubbed down filled and made good as necessary and thoroughly cleaned down immediately before decoration is applied.

Plaster finished with a wood float or other rough textured surface of a similar nature shall be made good as necessary and thoroughly brushed clean immediately before decoration is applied.

Insulating board or similar surfaces shall be filled and made good as necessary and lightly brushed down to remove all dirt, dust and loose particles.

Metal work to be painted shall be scaled clean and thoroughly wire brushed.

Woodwork to be painted shall be well rubbed down. All knots shall be covered with good knotting before priming and all defects shall be filled with hard stopping after priming. Plywood shall be brush filled over the entire surface

Woodwork to receive finishes other than paint shall have all stains and pencil marks removed, be well rubbed down and have all defects levelled up with hard stopping of a colour to match the adjoining surface.

Woodwork to be clear varnished shall be well rubbed down and the varnish is to be applied with a chamois leather pad, rubbed back with fine graded steelwool between coats and afterwards buffed up to produce an approved finish.

All woodwork to be varnished is to have all pencil and other marks removed and surfaces smoothed down prior to application.

PAINTS

All paints used should be obtained from one of the following manufacturers after obtaining the Architect's approval and of the product specification hereinafter described.

a) Robbialac

b) Crown Paints

c) Dulux Paints

d) Sadolins

PLASTIC EMULSION PAINTS

Plastic emulsion paint for internal and external application shall be of a manufacture approved by the Architect.

BITUMINOUS SOLUTION

Bituminous solution for use on coated pipes shall be obtained from a manufacturer approved by the Architect.

PRIMERS

Unprimed steelwork shall be primed with a Red Lead Primer.

Galvanised steelwork shall be treated with a mordant solution and primed with a Zinc Chromate Primer.

Woodwork shall be primed with a Pink Wood Primer.

UNDERCOATING

The undercoat for use under enamel finishing coats shall be an approved undercoat.

PRODUCT SPECIFICATION FOR PAINTS

Product specification for paints shall be in accordance with the composition requirements and may be required to be tested by the M.O.W. Materials Testing Branch.

	1st Quality Emulsion Paint	2nd Quality Emulsion Paint	1st Quality Alkyd Gloss Paint
Non-volatile(B.S Content3900 B2)	Must not exceed 50% by weight	Not more than 60% by weight	Less than 50% by weight
Pigment Volume Concentration	Not more than 5%	Not more than 70%	Less than 25%
Resin type	Vinyl Acetate/ Acrylic Ester Copolymer	Vinyl Acetate/ Acrylic Ester Copolymer	Long Oil Alkyd minimum oil length not less than 60%
Opacity requirement (contrast ratio to B.S. 3900 D4)	Not less than 80%	Not less than 70%	Not less than 90%
Pigment/ Binder Ratio	Not more than 2.25:1	Not more than 2.75:1	Not more 2.25:1

PRICING INFORMATION

The numbers of coats stated in the descriptions in these Bills of Quantities shall be applied in addition to any primers, stoppers, fillers, sealers, knotting, stopping, etc. required. The Contractor's prices shall be deemed to include for supplying and applying all such preparatory materials as may be required by the Standard Specification as recommended by the manufacturer of the finishing coat for the particular surface to be covered. The Contractor's prices shall further include for all other preparatory.

SECTION C

STRUCTURAL ENGINEERS SPECIFICATION

GENERAL

ARCHITECT OR ENGINEER

Where the word 'Engineer' is used in these descriptions of Materials and Workmanship, it shall in all appropriate cases be used and construed as the 'Structural Engineer'. For this purpose the Engineer shall be deemed vested with the duties of and be the representative of the Architect.

DISCREPANCIES IN DESCRIPTIONS

Descriptions of materials and workmanship contained in the Bills of Quantities measured items shall take precedence over descriptions contained in Appendices in the event of discrepancies between the two, unless the Engineer shall otherwise direct.

TESTS AND SAMPLES

Unless otherwise described in the Bills of Quantities, the Contractor will be responsible for all the costs involved in testing materials as described hereinafter. He will also be responsible for all the costs involved in supplying samples of materials or workmanship as required hereinafter to the satisfaction of the Engineer. The cost of replacing materials fixed or placed in position which do not comply with the required test results or approved samples shall be borne solely by the Contractor. Samples of materials shall be submitted as soon as possible after the Contract is let. No deliveries in bulk shall be made until the samples are approved by the Engineer.

STANDARDS

All materials and goods supplied for incorporation in the works must comply with any relevant standards issued by the Kenya Bureau of Standards or by the British Standard Institution.

EXCAVATION AND EARTHWORK

SITE CLEARANCE

Site clearance shall include the cutting down of all trees, stumps, bushes, vegetation and rubbish, burning the debris arising in approved locations, and carting remaining material to a tip provided by the Contractor.

GRUBBING

Grubbing up roots etc. shall include the following and disposal shall be as described under the foregoing clause :-

1. Stumps and roots of large trees shall be completely removed.
2. Stumps and roots of small trees, bushes or other vegetation shall be completely removed to a depth of at least 600mm below formation.
3 Smaller stumps and roots of vegetation up to 25mm thick shall be completely removed to a depth of 230mm below formation.
4. Fine roots shall be removed to as great depth as is practicable by hand.

Except where the area of grubbing is to be excavated, all resulting holes shall be filled up solid with approved material compacted to the same relative density as the surrounding material.

EXCAVATION

The Contractor is advised to visit the site and ascertain the nature of the ground to be excavated and he shall price accordingly and no claim will be allowed for want of knowledge in this respect.

Rates for excavation shall include for excavation in soil, earth, black cotton, sandy soil, murram, tuff, soft rock, boulders or whatever other subsoil is encountered, except hard rock as defined below.

HARD ROCK

Any rock or other hard materials encountered in excavating to the required depths which in the opinion of the Architect or Engineer can only be removed by wedges, compressed air or other special plant, or explosives shall be paid for as an extra and the price shall include for trimming and levelling. No blasting will be allowed without prior permission. Material which can be removed by pick or traxcavator, ripper or similar mechanical plant will not be classed as rock.

FOUNDATION EXCAVATIONS

(a)The foundation trenches and column bases shall be excavated to the widths and depths of the concrete foundations shown on the drawings or to such widths and depths as the Engineer may instruct after examination of the excavations. Quantities of all excavations shall be measured and valued by the Quantity Surveyor and any difference between such measurements and the measurements herein given shall be dealt with as a variation of the Contract. If, however, the Contractor excavates to any greater depths than shown in the drawings or as instructed by the Engineer, then he shall at his own expense fill in such extra depth of excavation with concrete as specified for the foundations, to the satisfaction of the Engineer. The Contractor shall not be paid for the cost of any excavation executed deeper or wider than shown on the drawings or instructed by the Engineer nor for the cost of back filling such excavation or disposing of surplus.

(b) The Contractor shall report to the Engineer when secure bottoms have been obtained to the excavations and are ready to receive the foundation concrete. Any concrete or other work put in before the excavations have been inspected and approved by the Engineer shall, if so directed, be removed and new work substituted in accordance with the specification after excavations have been approved, all at the Contractor's expense.

(c) The bottoms of all foundation trenches and column bases shall be trimmed square and level. The Contractor shall form such steps on bottoms of foundation trenches as the Engineer may consider necessary in such positions and to such depths as he may direct.

SURPLUS SOIL DISPOSAL

Excavated material not required for subsequent refilling shall be removed to areas off site which will be approved by the Architect.

TOP SOIL FOR SPREADING

Where required in the Bills of Quantities, top soil required for subsequent spreading over finished work shall be especially selected and shall be dumped in special heaps as

indicated by the Architect. Such top soil shall be reasonably free from vegetation to the satisfaction of the Architect, and shall be compacted as little as possible in the heaps.

FILLING UNDER SURFACE BEDS IN BUILDINGS

Murram Filling

Murram for filling as base course shall be from an approved source and of the highest quality. It shall be laid in layers not less than 150mm thick and not greater than 230mm thick prior to compaction. Water will be applied to O.M.C. and each layer will be thoroughly compacted by at least 8 passes of a 10 tonne smooth wheeled roller or a 2 tonne vibrating roller until all movement ceases and 100% M.D.D. is obtained.

Hardcore Filling

Hardcore filling shall be crushed rock, broken brick, broken concrete or other approved hard granular materials broken to pass not greater than a 150mm ring or to be 75% of the finished thickness of the layers being compacted whichever is the less and graded so that it can be easily and thoroughly compacted by rolling. The filling is to be laid in layers each of a consolidated thickness not exceeding 230mm. Where rolling by 10 tonne smooth wheeled roller or 2 tonne vibrating roller is impossible, compaction shall be by hand or mechanical tampers. Each layer shall be compacted by at least 8 passes of the roller.

The top surface of the hardcore shall be levelled or graded to falls as required and blinded with similar material broken to 25mm gauge and surfaced with stone dust and well wetted before consolidation by the roller. The surface so obtained shall be to the Engineer's approval.

MATERIALS FOUND IN EXCAVATIONS

All materials classified as rock may, if approved by the Architect or Engineer be used as hardcore filling and the measured quantities of imported filling will be adjusted accordingly; all rock so used must be broken to the required size as before described before being used.

No sand, aggregate, murram or other material found in the excavations is to be used in the works without the written permission of the Engineer.

FILLING OBTAINED FROM THE EXCAVATIONS

Filling obtained from surplus excavated materials is to be free from all weeds, roots, vegetable soil or other unstable materials and is to be filled in layers each of not more than 230mm finished thickness. Each layer to be well wetted and consolidated as described herein.

INSECTICIDE TREATMENT

Where described, the top surface of filling shall be treated with Gladiator Pesticide (manufactured by Dow Agrosciences Ltd.) to be applied by Rentokil Ltd., P.O. Box 44360, Nairobi, or other equal and approved firm, in accordance with the manufacturer's instructions and subject to a twenty year guarantee to the satisfaction of the Architect.

DIOTHENE SHEETING

Diothene sheeting shall be produced by an approved manufacturer. Joints in sheeting shall be treble folded with a 150mm fold and taped at 300mm intervals with 50mm wide black plastic adhesive tapes. The sheeting shall not be stretched but shall be laid with sufficient wrinkles to permit shrinkage up to 15%.

CONCRETE WORK

ARCHITECT/ENGINEER

For the purpose of the concrete structure the Structural Engineer shall be deemed vested with the duties of and be the representative of the Architect.

CODE OF PRACTICE

All workmanship, materials, tests and performances in connection with the reinforced concrete work are to be in conformity with the latest edition of the appropriate British Standards where not inconsistent with these specifications.

SUPERVISION

A competent person approved by the Engineer shall be employed by the Contractor whose duty will be to supervise all stages in the preparation and placing of the concrete. All cubes shall be made and site tests carried out under his direct supervision, in consultation with the Engineer.

CONTRACTOR'S PLANT, EQUIPMENT AND CONSTRUCTION PROCEDURES

Not less than 30 days prior to the installation of the Contractor's plant and equipment for processing, handling, transporting and storing and proportioning ingredients, and for mixing, transporting and placing concrete, the Contractor shall submit drawings for approval by the Engineer, showing proposed general plant arrangement, together with a general description of the equipment he proposes to use.

After completion of installation, the operation of the plant and equipment shall be subject to the approval of the Engineer.

Where these specifications, the Bills of Quantities or the drawings require specific procedures to be followed, such requirements are not to be construed as prohibiting use by the Contractor of alternative procedures if it can be demonstrated to the satisfaction of the Engineer, that equal results will be obtained by the use of such alternatives.

Approval of plant and equipment or their operation, or of any construction procedure, shall not operate to waive or modify any provisions or requirements contained in these specifications governing the quality of the materials or of the finished work.

LEVELS AND FOUNDATIONS

The foundations of the work shall be carried down to depths as may be directed by the Engineer and they must be cut as nearly to the size of the concrete as possible and the vacant spaces between the concrete and solid ground excepting where otherwise shown must be carefully filled in as directed by the Engineer.

All temporary timbering shall be removed but should any timber be left in or should any other work be done beyond that specified, it will be at the Contractor's own cost.

TOLERANCES

On all setting out dimensions of 6m and over a maximum non-accumulative tolerance of plus or minus 6mm will be allowed. On all setting out dimensions under 6m a maximum non-accumulative tolerance of plus or minus 3mm will be allowed. On the cross sectional

dimensions of structural members, unless otherwise required by the drawings, a maximum tolerance of plus or minus 3mm will be permitted.

The top surface of concrete floor slabs and beams shall be within 6 mm of the normal level and line shown on the drawings. Columns shall be truly plumb and non-accumulative tolerance of 3 mm in each storey and not more than 12 mm out of plumb in their full height will be permitted. The Contractor shall be responsible for the cost of all corrective measures required by the Engineer to rectify work which is not constructed within the tolerances set out above.

MATERIALS GENERALLY

All materials which have been damaged, contaminated or have deteriorated or do not comply in any way with the requirements of these specifications shall be rejected and shall be removed immediately from the site at the Contractor's own expense. No materials shall be stored or stacked on suspended floors without the Engineer's prior approval.

SAMPLES AND TESTING

Every facility shall be provided to enable the Engineer to obtain samples and carry out tests on the materials and construction. If these tests show that any of the materials or construction do not comply with the requirements of these specifications, the Contractor will be responsible for the costs of the tests and the replacement of defective materials and/or construction.

CEMENT

Cement unless otherwise specified shall be Portland Cement of a brand approved by the Engineer and shall comply with the requirements of B.S. 12, and a manufacturer's certificate of test in accordance with B.S. 12 shall be supplied for each consignment delivered to the site. Provided that the approval of the Engineer is obtained, the cement may vary from B.S. 12 in that up to 10% of the total weight may be reactive volcanic ash and the quantity of insoluble residue may exceed that specified by B.S. 12.

Should the Contractor require to use cement of the rapid hardening variety, he shall obtain the approval of the Engineer and also obtain any instructions regarding modifications to these specification caused thereby. Any additional cost that may be caused by the use of rapid hardening cement shall be at the Contractor's expense.

Cement may be delivered to the site either in bags or in bulk.

If delivered in bags each bag shall be properly sealed and marked with the manufacturer's name and on the site is to be stored in a weatherproof shed of adequate dimensions with a raised floor. Each consignment shall be kept separate and marked so that it may be used in the sequence in which it is received. Any bag found to contain cement which has set or partly set, shall be completely discarded and not used in the works. Bags shall not be stored more than 1.50 metres in height.

If delivered in bulk the cement shall be stored in a weatherproof silo either provided by the cement supplier or by the Contractor but in either case the silo shall be to the approval of the Engineer.

AGGREGATES

Aggregates shall conform with the requirements of B.S. 882 and the sources and types of all aggregates are to be approved in all respects by the Engineer before work commences.

The grading of fine aggregates shall be within the limits set out in B.S. 882 and as later specified and the grading, once approved, shall be adhered to throughout the works and siliceous sand of good, sharp, hard quality and shall be free from lumps of stone, earth, loam, dust, salt, organic matter and any other deleterious substances. It shall be graded within the limits of Zone F or M of Table 2 of B.S. 882. Sea sand will not be accepted.
Coarse aggregate for concrete Classes '30', '25', and '20' shall be black trap, Mazeras, or similar basaltic stone to the approval of the Engineer and coral aggregate will not be accepted. It shall be hard, clean and of good shape, free from dust, decomposed stone, clay, earthy matter, foreign substances or friable thin elongated or laminated pieces. It shall be graded within the limits of Table 1 of B.S. 882 for its respective nominal size.

If in the opinion of the Engineer the aggregate meets with the above requirements but is dirty or adulterated in any manner it shall be screened and/or washed with clean water if he so directs at the Contractor's expense,

Aggregates shall be delivered to the site in their prescribed sizes or gradings and shall be stockpiled on paved areas or boarded platforms in separate units to avoid intermixing. On no account shall aggregates be stockpiled on the ground.

The Engineer shall be entitled to require a certificate from an approved testing laboratory in connection with each source of fine and coarse aggregate showing that materials comply with the specification.

WATER

The water used for mixing concrete shall be from an approved source, clean, fresh and free from harmful matter, and comply with B.S. 3148.

EXPANSION JOINT FILLER

Expansion joint filler shall be 'Flexcell' as manufactured by Expandite Ltd., or 'Resilex' as manufactured by Evomatics Ltd. or equal and approved.

JOINT SEALER

Sealers shall be 'Pli-astic' or 'Seelastic' as described, both manufactured by Expandite Ltd., applied in accordance with the manufacturer's printed instructions and prices shall include for temporary battens or fillets and afterwards withdrawing to form grooves as necessary.

'Seelastic' shall be applied by gun and where more than 12mm deep shall include filling the groove with loose packing yarn to within 1mm from outer face.

'Pli-astic' shall be Grade 88 and applied hot. With the Engineer's prior approval 'Polevomastic' fillers of the appropriate grade as manufactured by Evomastics Ltd. may be substituted for 'Seelastic' and 'Pli-astic'.

CONCRETE STRENGTHS

Classes '30', '25', and '20' concrete shall have the minimum strengths as given by works cube tests shown here below.

Classes lower than those given shall be of the following nominal mixes and may be measured by volume or weight. No cube tests will be required for these classes.

Nominal mix by volume	1:3:6 (Class 15)	1:4:8 (Class 10)
Cubic m. fine aggregate per 50Kg. bag of cement	0.12	0.16
Cubic m. coarse aggregate per 50Kg. bag of cement	0.24	0.32

Max. size of coarse aggregate	40mm	40mm

MEASURED PROPORTIONS OF CONCRETE

Cement

The quantity of cement shall be measured by weight. Where delivered in bags, each batch of concrete is to use one or more whole bags of cement.

Aggregate (i) For Classes '30', '25', and '20' concrete shall be measured by weight in a weigh batching machine as described hereafter.

(ii) For lower Classes concrete, aggregates may be measured by weight or by volume. Where by volume, approved gauge boxes of such a size as will give the correct proportions shall be used.

WEIGH BATCHING MACHINE

Weigh batching machines shall be of an approved type and shall be properly maintained and checked for accuracy at regular intervals.

CONCRETE CLASSES - '30', '25', and '20'

The weights of fine and coarse aggregate to be used in concrete classes '30', '25', and '20' shall be limited in accordance with the table below. The proportions of fine to coarse aggregate and cement which the Contractor proposes to use for the mix specified shall first be approved by the Engineer. The Contractor will then be required to prepare preliminary test cubes and have these cubes tested as described for work cube tests. The test results should be submitted to the Engineer in sufficient time for further tests to be carried out should they prove unsatisfactory. Cube strengths in the preliminary tests must show crushing strengths of at least 25% higher than the strengths specified for work cube tests. If the Contractor is unable to produce specified cube strengths, he will be required at his own cost to increase the cement of the mix until satisfactory results are produced.

Minimum Crushing Strengths

Age	Class 30	Class 25	Class 20
7 days	21.0 N/mm2	17.5 N/mm2	14.0 N/mm2
28 days	31.0 N/mm2	26.5 N/mm2	21.0 N/mm2

The average strength obtained from cube tests shall be 10% higher than the minimum strength shown above.

The Engineer may require at any time during the Contract the proportions of fine to coarse aggregate to be altered in order to produce a mix of greater strength or improved workability and providing that the total proportions of aggregate to cement remain unchanged, no claim for additional cost will be considered.

Concrete shall be poured to the classes as follows:-

The mixes given below e.g. 1:3:6 shall mean concrete composed by volume one part Portland cement, three parts sand or fine aggregate and six parts of coarse aggregate. All other compositions shall be interpreted in a like manner.

Class '30' concrete 1:1$^1/_2$:2	using 5mm to 20mm coarse aggregate
Class '25' concrete 1:1$^1/_2$:3	using 5mm to 20mm coarse aggregate
Class '20' concrete 1:2:4	using 5mm to 20mm coarse aggregate

Unless otherwise specified concrete shall be used as follows:-

High stress reinforced concrete	CLASSES '30'
Normal reinforced concrete	CLASSES '25' & '20'
Reinforced concrete member of thickness 75mm or less	CLASSES '20'
Surface beds, threshold, concrete surface channels and mass concrete fill	Concrete 1:3:6 mix
Concrete benching to cupboards and fittings and filling where described	Concrete 1:4:8 mix

MINIMUM CEMENT CONTENT - CLASSES ' '30', '25', and '20'

The minimum cement content by weight shall be limited to :-

Mix.	'30'	'25'	'20'	1:3:6	1:4:8
Minimum cement content (kg/m3)	300	300	260	220	150

WATERPROOF CONCRETE

Where 'waterproof concrete' is specified, the system may be an approved surface applied product, or waterproofing additives of a type approved in writing by the Engineer are to be added to the mixing water strictly in accordance with the manufacturer's instructions. Not more than 25 litres of water per 50Kg. bag of cement are to be used unless otherwise approved by the Engineer.

WATER BAR

Water bar shall be P.V.C. water bar as manufactured by Expandite Limited, or other approved type and shall be provided in width and at the positions indicated on the drawings.

Joints shall be heat welded in accordance with the manufacturer's instructions and where the water bar is to be fixed vertically, metal clips as manufactured by the supplier of the water bar or of other approved design shall be provided to suspend the water bar from the reinforcement.

Where waterproof concrete is used the Contractor shall adhere strictly to the position and type of construction joints as detailed on the drawings. Any deviation from this procedure or the provision of additional construction joints will require the prior approval of the Engineer and any additional water bar so required will be at the Contractor's expense.

Formwork shall be designed with sufficient timber formers and blocking pieces to support the water bar and to ensure that it is not displaced during concreting. In the case of horizontal joints in vertical walling and similar members the formwork shall be so constructed as to permit the starter or upstand of concrete surrounding the lower half of the water bar to be poured in the same operation as the slab or other concrete from which it springs. Formwork to walls or similar members where water bar is positioned at the base of the lift shall have sufficient openings not less than 300mm square at approximately

150mm to 300mm above the level of the water bar to permit checking that the water bar is correctly positioned and not displaced during concreting.

No concreting will be permitted to portions where upstand starters form an integral part until the formwork to the starter has been fixed and approved.

SEALOCRETE SUPERCOAT WATERPROOFER

Where specified 'Sealocrete Supercoat Waterproofer' shall be applied to concrete or blockwork surfaces strictly in accordance with the manufacturer's instructions. The surfaces must be well wire-brushed to remove dirt, efflorescence, adhering mortar and all foreign matter. It shall then be cleaned with fresh water. When absolutely dry a generous coat of Sealocrete Supercoat shall be applied by brush or spray gun. Surfaces so treated shall be protected from damage or staining as described elsewhere.

TESTING EQUIPMENT

The Contractor shall provide the following equipment for carrying out control tests on the site :-

(a) Straight edges 3.00m and 1.20m long for testing the accuracy of the finished concrete;

(b) A glass graduated cylinder for use in the silt test for organic impurities in the sand;

(c) Slump test apparatus;

(d) Four 150mm steel cube moulds with base plates and tamping rods to B.S. 1881.

WORK CUBE TESTS

Work cubes are to be made at intervals such that one set of four cubes shall represent no more than 50m3 of concrete in the works or as required by the Engineer and the Contractor shall provide a continuous record of the concrete work. The cubes shall be made in approved 150mm moulds in strict accordance with the British Standards.

Four cubes shall be made on each occasion, from each batch, the concrete being taken from the point of deposit.

Each cube shall be marked with a distinguishing number (numbers to run consecutively) and the date, and a record shall be kept on site giving the following particulars :-

(a) Cube No.

(b) Date made.

(c) Location in work.

(d) 7-day Test

Date
Strength required

(e) 28-day Test

Date
Strength required

Cubes shall be forwarded, carriage paid, to an approved Testing Authority, in time to be tested, two at 7 days and one at 28 days and the fourth at the discretion of the Engineer. No cube shall be despatched within 3 days of casting.

Copies of all work cube test results shall be forwarded to the Engineer and one shall be retained on the site.

If the strengths required above are not attained, and maintained throughout the carrying out of the Contract, the Contractor will be required to increase the proportion of cement and/or substitute better aggregates so as to give concrete which does comply with the requirements of the Contract. The Contractor may be required to remove and replace at his own cost any concrete which fails to attain the required strength as ascertained by work cube tests.

The Contractor must allow in his rates for concrete test cubes for all expenses in connection with the preparation and conveyance to the Testing Laboratory of test cubes and no claim in respect of his not so doing will be allowed.

MIXING AND PLACING OF CONCRETE

The concrete shall be mixed only in approved power driven mixers of a type and capacity suitable for the work, and in any event not smaller than 0.33 cu.m. capacity.

The mixer shall be equipped with an accurate water measuring device. All materials shall be thoroughly mixed dry before the water is added and the mixing of each batch shall continue for a period of not less than two minutes after the water has been added and until there is a uniform distribution of the materials and the mass is uniform in colour.

The entire contents of the mixed drum shall be discharged before recharging. The volume of mixed materials shall not exceed the rated capacity of the mixer. Whenever the mixer is started, 10% extra cement shall be added to the first batch and no extra payment will be made on this account.

As a check on concrete consistency slump tests may be carried out and shall be in accordance with B.S. 1881. The Contractor shall provide the necessary apparatus and allow for the costs of such tests. The slump of the concrete made with the specified water content, using dry materials, shall be determined and the water to be added under wet conditions shall be so reduced as to give approximately the same slump. Slump shall be 75 $\pm$ 25mm, unless otherwise instructed by the Engineer.

The concrete shall be mixed as near to the place where it is required as is practicable, and only as much as is required for a specified section of the work shall be mixed at one time, such section being commenced and finished in one operation without delay. All concrete must be efficiently handled and used in the works within twenty (20) minutes of mixing. It shall be discharged from the mixer direct either into receptacles or barrows and shall be distributed by approved means which do not cause separation or otherwise impair the quality of the concrete. Approved mechanical means of handling will be encouraged, but the use of chutes or pumping for placing concrete is subject to the prior approval of the Engineer.

Concrete shall be placed from a height not exceeding 1.5m directly into its permanent position and shall not be worked along the shutters to that position. Unless otherwise approved, concrete shall be placed in a single operation to the full thickness of slabs, beams and similar members, and shall be placed in horizontal layers not exceeding 1.4m deep in walls or similar members.

Concrete in columns may be placed to a height of 4.00m with careful placing and vibration and satisfactory results. Where the height of the column exceeds 4.00m suitable openings must be left in the shutters so that this maximum lift is not exceeded.

Concrete shall be placed continuously until completion of the part of the work between construction joints as specified hereinafter or of a part of approved extent. At the completion of a specified or approved part a construction joint of the form and in the positions hereinafter specified shall be made. If stopping of concreting be unavoidable elsewhere, a construction joint shall be made where the work is stopped. A record of all such joints must be made by the Contractor and a copy supplied to the Engineer.

Any accumulation of set concrete on the reinforcement shall be removed by wire brushing before further concrete is placed.

The Contractor shall provide runways for concreting to the satisfaction of the Engineer. Under no circumstances will the runways be allowed to rest on the reinforcement.

Care shall be taken that the concrete is not disturbed or subjected to the vibrations and shocks during the setting period.

Mixing machines, platforms and barrows shall be clean before commencing mixing and be cleaned on every cessation of work.

Where concrete is laid on hardcore or other absorbent materials, the base shall be suitably and sufficiently wetted before the concrete is deposited.

COMPACTION

At all times during which concrete is being placed, the Contractor shall provide adequate trained and experienced labour to ensure that the concrete is compacted in the forms to the satisfaction of the Engineer.

Concrete shall not be placed at a rate greater than will permit satisfactory compaction nor to a depth greater than 450mm before it is compacted.

During and immediately after placing, the concrete shall be thoroughly compacted by means of continuous tamping, spading, slicing and vibration. Vibration is required for all concrete of classes '30', '25' and '20'

Care shall be taken to fill every part of the forms, to work the concrete under and around the reinforcement without displacing it and to avoid disturbing recently placed concrete which has begun to set.

Any water accumulating on the surface of newly placed concrete shall be removed and no further concrete shall be placed thereon until such water be removed.

Internal vibrators shall have a frequency of not less than 7,000 cycles per minute and shall have a rotating eccentric weight of at least 0.7Kg., with an eccentricity of not more than 12mm. Such vibrators shall visibly affect the concrete within a radius of 230mm from the vibrator.

Internal vibrators shall not be inserted between layers of reinforcement less than one and a half times the diameter of the vibrators apart. Contact between vibrators and reinforcement and vibrators and formwork shall be avoided.

Internal vibrators shall be inserted vertically into the concrete wherever possible at not more than 500 mm centres and shall constantly be moved from place to place. No internal vibrator shall be permitted to remain in any one position for more than ten seconds and it shall be withdrawn very slowly from the concrete.

In consolidating each layer of concrete the vibrating head shall be allowed to penetrate and re-vibrate the concrete in the upper portion of the underlying layer. In the area where newly placed concrete in each layer joins previously placed concrete more than usual vibration

shall be performed, the vibrator penetrating deeply at close intervals along these contacts. Layers of concrete shall not be placed until layers previously placed have been vibrated thoroughly as specified.

Vibrators shall not be used to move concrete from place to place in the formwork.

At least one internal vibrator shall be operated for every three cubic metres of concrete placed per hour and at least one spare vibrator shall be maintained on site in case of break-down during concreting operations.

External formwork vibrators shall be of the high frequency low amplitude type applied with the principal direction of vibration in the horizontal plane. They shall be attached directly to the forms at not more than 1224mm centres.

In addition to internal and external vibration the upper surface of suspended floor slabs shall be levelled with a tamping or vibrating screed prior to finishing. Vibrating elements shall be of the low frequency high amplitude type operating at a speed of not less than 3,000 r.p.m.

CONSTRUCTION JOINTS

Construction joints shall be permitted only at the positions pre-determined on the drawings or as instructed on the site by the Engineer. In general they shall be perpendicular to the lines of principal stress and shall be located at points of minimum shear, viz. vertically at, or near, mid-spans of slabs, ribs and beams.

Suspended concrete slabs are generally to be cast using alternate bay construction in bays not exceeding 13 metres in length. No two adjacent bays are to be cast within a minimum period of 48 hours of each other. The joints between adjacent bays are to be in positions agreed with the Engineer.

Under no circumstances shall concrete be allowed to tail-off, but it shall be deposited against stopping-off boards.

Before placing new concrete against concrete already hardened, the face of the old concrete shall be thoroughly hacked, roughened and cleaned, and laitance and loose material removed therefrom, and immediately before placing the new concrete the surface shall be saturated with water and covered with a coat of mortar at least twenty five mm in thickness composed of cement and fine aggregate in the proportions used in the concrete.

CURING AND PROTECTION

Care must be taken that no concrete is allowed to become prematurely dry and the fresh concrete must be carefully protected within two hours of placing from rain, sun and wind by means of hessian sacking, polythene sheeting, or other approved means. This protective layer and the concrete itself must be kept continuously wet for at least seven days after the concrete has been placed. The Contractor must allow for the complete coverage of all fresh concrete for a period of 7 days. Hessian or polythene sheeting shall be in the maximum widths obtainable and shall be secured against wind. The Contractor will not be permitted to use old cement bags, hession or other material in small pieces.

Concrete in foundations and other underground work shall be protected from admixture with falling earth during and after placing.

Traffic or loading must not be allowed on the concrete until the concrete is sufficiently matured, and in no case shall traffic or loading be of such magnitude as to cause deflection or other movement in the formwork or damage to the concrete members. Where directed

by the Engineer props may be required to be left in position under slabs and other members for greater period than those specified hereafter.

FAULTY CONCRETE

Any concrete which fails to comply with these specifications, or which shows signs of setting before it is placed shall be taken out and removed from the site. Where concrete is found to be defective after it has set, the concrete shall be cut out and replaced in accordance with the Engineer's instructions. On no account shall any faulty, honeycombed, or otherwise defective concrete be repaired or patched until the Engineer has made an inspection and issued instructions for the repair. The whole of the cost whatsoever, which may be occasioned by the need to remove faulty concrete shall be borne by the Contractor.

ROD REINFORCEMENT

The steel reinforcement shall be mild steel or high tensile steel as detailed on drawings or schedules and comply with the latest requirements of the following British Standards :-

Hot rolled bars for the reinforcement of concrete — to B.S. 4449 (metric units)

Cold worked steel for the reinforcement of concrete — to B.S. 4461 (metric units)

Hard drawn steel wire — to B.S. 4482 (metric units)

It shall be in metric sizes as detailed on the drawings.

The Contractor shall submit a test certificate of the rollings. Reinforcement shall be stored on racks above ground level. All reinforcement shall be free from loose mill scale or rust, grease, paint or other substances likely to reduce the bond between the steel and concrete.

FABRIC REINFORCEMENT

To be electrically cross-welded wire mesh reinforcement to B.S. 4483 and of the size and weight specified

FIXING ROD REINFORCEMENT

Reinforcement shall be accurately bent to the shapes and dimensions shown on the drawings and schedules and in accordance with B.S. 4466. Reinforcement must be cut and bent cold and no welded joints will be permitted unless so detailed.

Reinforcement shall be accurately placed in position as shown on the drawings and, before and during concreting, shall be secured against displacement by using No. 18 S.W.G. annealed binding wire or suitable clips at intersections, and shall be supported by concrete or metal supports, spacers or metal hangers to ensure the correct position and cover.

No concreting shall be commenced until the Engineer has inspected the reinforcement in position and until his approval has been obtained and the Contractor shall give two clear days' notice of his intention to concrete.

The Contractor is responsible for maintaining the reinforcement in its correct position, according to the drawings, before and during concreting. During concreting a competent steel fixer must be in attendance on the concretors to adjust and correct the positions of any reinforcement which may be displaced. The vibrators are not to come into contact with the reinforcement.

Where reinforcement projects from a concreted section of the structure and this reinforcement is expected to remain exposed for some time, it is to be coated with a cement grout to prevent rust staining on the finished concrete. This grout is to be brushed off the reinforcement prior to the continuation of concreting.

POSITION AND CORRECTNESS OF REINFORCEMENT

Irrespective of whether any inspection and/or approval of the fixing of the reinforcement has been carried out as above, it shall be the Contractor's sole responsibility to ensure that the reinforcement complies with the details on the drawings or schedules and is fixed exactly in the positions shown therein and in the positions to give the prescribed cover. The Contractor will be held entirely responsible for any failing or defect in any portion of the reinforced concrete structure and including any consequent delay, claims, third party claims, etc., where it is shown that the reinforcement has been incorrectly positioned or is incorrect in size or quantity with respect to the detailed drawings or schedules.

SPACING BLOCKS

Spacing blocks of approved size and shape made of concrete similar to that used in the surrounding construction and fixed to the reinforcement or formwork by No. 18 S.W.G. wires set into the spacer blocks, or other approved means, shall be provided where necessary to ensure that the requisite cover is obtained. The Contractor is to include for providing sufficient such spacer blocks in his prices for steel reinforcement where a supplier has been nominated. Where composite blocks or other forms of rib construction are used, spacer blocks are to be provided as shown on the drawings. These will generally consist of concrete blocks as described above made to fit the width of the rib less 3mm tolerance and with single or double grooves (depending on the number of reinforcement bars used per rib) in the top surface with wire ties at each groove.

CONCRETE COVER TO REINFORCEMENT

Unless otherwise directed the concrete cover to rod reinforcement over main bars in any face shall be :-

Foundations	50mm
Columns and walls	40mm
Beams	25mm
Slabs	15mm

FIXING FABRIC REINFORCEMENT

The fabric shall be free from scale, rust, grease or other substance likely to reduce the bond between the steel and the concrete and shall be laid with minimum 300mm laps and bound with No. 18 S.W.G. annealed iron wire.

In all ground slabs, unless otherwise specified a single layer of square mesh steel fabric shall be placed at a depth of 50mm below the top surface of the concrete. The fabric shall comply in all respects with B.S. 4483 and be of the size and weight specified or shown on the drawings.

The fabric shall extend to within 75mm of the expansion joints and shall have laps of at least 230mm at all joints in the fabric at junctions with reinforced concrete beams or other members. It shall be placed on top of the first layer of concrete as previously described and sufficient wire ties shall be provided to ensure that the fabric is held down securely.

FIXTURES AND INDENTATIONS IN CONCRETE

No openings, chases, holes or other voids shall be formed in the concrete without the prior approval of the Engineer. Details of any fixtures to be permanently built into the concrete including the proposed position of all electrical conduits 25mm and over in diameter shall be submitted to the Engineer for his approval before being placed.

CHASES, HOLES, ETC. IN CONCRETE

The Contractor shall be responsible for the co-ordination with the Electrical and other Sub-Contractors for incorporating electrical conduit, pipes, fixing blocks, chases, holes and the like in concrete members as required and must ensure that adequate notice is given to such Sub-Contractors informing them when concrete members incorporating the above are to be poured. The Contractor shall submit full details of these items to the Engineer for approval before the work is put in hand. All fixing blocks, chases, holes, etc., to be left in the concrete shall be accurately set out and cast with the concrete.

POSITION OF ELECTRICAL CONDUIT

Unless otherwise instructed by the Engineer all electrical conduit to be positioned within the reinforced concrete shall be fixed inside the steel cages of beams and columns and between the top and bottom steel layers in slabs and similar members.

The proposed position of all electrical conduits 25mm and over in diameter which are to be enclosed in the concrete shall be shown accurately on a plan to be submitted to the Engineer, whose approval shall be obtained before any such conduit is placed.

FORMWORK

The method and system of formwork which the Contractor proposes to use shall be approved by the Engineer before construction commences. Formwork shall be substantially and rigidly constructed of timber or steel or precast concrete or other approved material.

All timber for formwork shall be good sound clean sawn well-seasoned timber, free from warps and loose knots and of scantlings sufficiently strong for their purpose.

CONSTRUCTION OF FORMWORK

All formwork shall be of sufficient thickness and with joints close enough to prevent undue leakage of liquid from the concrete and fixed to proper alignment, level and plumb and supported on sufficiently strong bearers, shores, braces, plates, etc. properly held together by bolts or other fastenings to prevent displacement, vibration or movement by the weight of materials, men and plant on same and so wedged and clamped as to permit of easing and removal of the formwork without jarring the concrete. Where formwork is supported on previously constructed portions of the reinforced concrete structural frame, the Contractor shall be in consultation with the Engineer to ensure that the supporting concrete structure is capable of carrying the load and/or sufficiently propped from lower floors or portions of the frame to permit the load to be temporarily carried during construction.

Soffits shall be erected with an upward camber of 10mm for each 4000mm of each horizontal span or as directed by the Engineer.

Great care shall be taken to make and maintain all joints in the formwork as tight as possible, to prevent the leakage of grout during vibration. All faulty joints shall be caulked to the Engineer's approval before concreting.

The formwork shall be sufficiently rigid to ensure that no distortion or bulging occurs under the effects of vibration. If at any time the formwork is insufficiently rigid or in any way defective the Contractor shall strengthen or improve such formwork as the Engineer may direct.

The Contractor's attention is drawn to the various surface textures and applied finishes required and the faces of formwork next to the concrete must be of such material and construction and be sufficiently true to provide a concrete surface which will in each case permit the specified surface treatment or applied finish.

All surfaces which will be in contact with concrete shall be oiled or greased to prevent adhesion of mortar. Oil or grease shall be of a non-staining mineral type applied as a thin film before the reinforcement is placed. Surplus moisture shall be removed from the forms prior to placing of the concrete.

Temporary openings shall be provided at the base of columns, wall and beam forms and at any other points where necessary to facilitate cleaning and inspection immediately before the pouring of concrete. Before the concrete is placed the shuttering shall be trued-up and any water accumulated therein shall be removed. All sawdust, chips, nails and other debris shall be washed out or otherwise removed from within the framework. The reinforcement shall then be inspected for accuracy of fixing. Immediately before placing the concrete the formwork shall be well wetted and inspection openings shall be closed. The erection, easing, striking and removing of all formwork must be done under personal supervision of a competent foreman, and any damage occurring through faulty formwork or its incorrect removal shall be made good by the Contractor at his own expense.

After removal of formwork, all projections, fins, etc., on the concrete surface shall be chipped off, and made good to the requirements of the Engineer. Any voids or honeycombing shall be treated as described in 'Faulty Concrete'.

STRIPPING FORMWORK

All formwork shall be removed without undue vibration or shock and without damage to the concrete. No formwork shall be removed without the prior consent of the Engineer and the minimum periods that shall elapse between the placing of the concrete and the striking of the formwork will be as follows:-

Beam sides, walls and inclined columns (unloaded)	2 days
Slab horizontal soffits (props left under)	4 days
Beam soffits (props left under)	10 days

Removal of props (subject to 7 days concrete cube strength being satisfactory) to :-

Slabs	10 days
Beams	14 days

If the Contractor wishes to take advantage of the shorter stripping times permitted for beam and slab soffits when props are left in place, he must so design his formwork that sufficient props as agreed with the Engineer can remain in their original position without being moved in any way until expiry of the minimum time for removal of props. Stripping and re-propping will not be permitted.

The above times may be reduced in certain circumstances, at the discretion of the Engineer provided an approved method is adopted at the Contractor's expense to ensure that the required concrete strength is attained before the forms are stripped.

Solid strips in composite slab shall be considered as beams. The tops of retaining walls shall be adequately supported with stout raking props at intervals required by Engineer. These props are not to be removed until 7 days after casting of the floor slab.

FAIR FACE

Where fair face is specified the concrete shall be brought perfectly true smooth and even by rubbing with carborundum stone dipped in cement grout. Such work must be commenced within one hour of removing the formwork and be actively and rapidly persued until completed, the object being to complete the finish as soon as possible after the removal of the shuttering. On no account may such work be postponed to a later stage in the Contract. Fair face surfaces shall be clean, smooth, even, true to form and free from all board marks joint marks, honeycombing, pitting, etc. The Contractor is permitted at his own expense to provide smooth lining to the forms which will achieve the required finish without rubbing down. All rubbed down work must be lightly washed with plain cold water at the completion of the Contract, and not before the cement grout used in the finish is at least four weeks old after initial mixing

BUSH HAMMERED FINISH

The concrete surface prior to the tooling of this finish shall resemble in all respects that produced as 'Fair Face' above. Particular care is required to achieve complete compaction of the concrete.

The bush-hammering shall be carried out using approved tools and shall produce an even, tooled appearance. All arrises, projections, etc., shall remain true and sharp and no rounding off of edges shall be permitted. The Contractor is to take care that no reinforcement is exposed and that in any case no tooling penetrates the concrete surface by more than 10mm.

The Contractor shall, prior to any bush-hammering taking place, provide a sample measuring 1.00m square to the Engineer indicating the standard of bush-hammering to be achieved. This when approved by the Engineer will form the standard for the entire works. Any surface not complying with this standard shall be removed or made good to the Engineer's satisfaction at the Contractor's expense.

TAMPED FINISH

Areas so specified shall be finished at the time of casting with a tamped finish to the Engineer's approval produced by an edge board. Board marks are to be made to a true pattern and will generally be at right angles to the traffic flow. Haphazard or diagonal tamping will not be accepted.

WROT LINED FORMWORK

The shuttering shall be constructed of wrot tongued and grooved boarding, plywood or blockboard lined with approved laminated plastic sheeting to produce a concrete surface with truly flat surface completely free from all air bubbles, joint marks, honeycomb and other pittances and blemishes to the approval of the Engineer.

Should the Contractor desire to use alternative materials he should submit his proposals to the Engineer for approval.

Should the Contractor fail to obtain approval and the Architect subsequently rejects the work, the Contractor will at his own expense carry out all work necessary to attain the approval of the same.

BOARD MARKED FINISH

Where so directed or measured the finish shall be that of a board marked pattern in panels, the boards shall be arranged vertically or horizontally and of widths and sizes all as detailed on the drawings. All exposed concrete will be left unpainted and therefore every care and attention shall be paid to obtain a satisfactory visual appearance and the maintenance of the same throughout the building operation. The finished surfaces shall be free from blow holes, hungry patches and other blemishes, and a sample panel is to be provided and approved by the Engineer before work commences.

Unless otherwise specified, the formwork shall be rip sawn softwood to the Engineer's approval and shall have a sufficiently strong grain to impart a corresponding pattern to the concrete surface. Unless otherwise approved it shall have four uses only and shall be carefully cleaned from adhering grout after each use. It shall be lightly oiled with approved no-staining oil.

CHISEL DRESSED FINISH

Where specified a chisel dressed finish is to be carried out on any grade of concrete but not until it is at least 30 days old. The surfaces are to be fully chisel dressed to remove a maximum of 12mm (average 9mm) of the surface to expose the aggregate without excessive cracking or breaking thereon.

Where the drawings show details of arrises of columns, beams, etc., these are to be pre-formed with timber fillets set in the formwork and care must be taken in working up to those to preserve a clean line. For vertical surfaces of walls and columns, particular care must be taken to remove all sharp projections. For beam soffits this requirements is not necessary.

All chisel dressed surfaces are to have the margin chisel dressed by hand for a minimum width of 75mm commencing from the fillet edge. Thereafter mechanical chisel dressing may be used but the Contractor must ensure that a uniform texture and even plane surface is achieved. The use of pointed steel tools for both hand and mechanical chisel dressing is essential. Upon completion the surfaces are to be thoroughly wire brushed and washed down and protected during the course of construction from damage, dirt, cement grout, etc.

PRECAST CONCRETE

Unless otherwise approved by the Engineer, all precast concrete construction shall be carried out on the site and shall conform to the requirements given elsewhere.

The maximum size of coarse aggregate in precast concrete shall not exceed 20mm except for thicknesses less than 75mm where it shall not exceed 12mm.

The compaction of precast concrete shall conform with requirements given elsewhere in these Specifications except for thin slabs where use of immersion type vibrators is not practicable. The concrete in these slabs may be consolidated on a vibrating table or by any other methods approved by the Engineer.

Steam curing of precast concrete will be permitted. The procedure for steam curing shall be subject to the approval of the Engineer.

The precast work shall be made under cover and shall remain under the same for seven days. During this period and for a further seven days the concrete shall be shielded by sacking or other approved material kept constantly wet. It shall then be stacked in the open for at least a further seven days to season before being set in position. Where steam curing is used these times may be reduced to the approval of the Engineer.

Precast concrete units shall be constructed in individual forms. The method of handling the precast concrete units after casting, during curing and during transport and erection shall be subject to the approval of the Engineer. Providing that such approval shall not relieve the Contractor of responsibility for damage to precast concrete units resulting from careless handling.

Repair of damage to the precast concrete units, except for minor abrasions of the edges which will not impair the installation and/or appearance of the units will not be permitted and the damaged units shall be replaced by the Contractor at his own expense.

Moulds for 'Fair Face' precast work are to be made of metal or are to have metal or plywood linings or are to be other approved moulds which will produce a smooth dense fair face to the finished concrete suitable to receive a painted finish direct and free from all shutter marks, holes, pittances, etc. In his prices for such precast work the Contractor shall include for all rubbing down to produce the finish required, to the satisfaction and approval of the Engineer.

The precast units shall be installed to the lines, grades and dimensions shown on the drawings or as directed by Engineer.

COMPOSITE FLOOR OR ROOF SLABS

Concrete hollow blocks for used in the composite floor slabs are to be of the sizes required as shown on the drawings and with 30mm wall thickness and are to be of adequate strength to support the concrete during placing and consolidation by vibration. Blocks are to be manufactured in accordance with the procedure specified in B.S. 2028 and to be of a mix not weaker than 1:4:8 cement : sand : aggregate using maximum size aggregate.

Concrete blocks are to be cured for at least 28 days before use on the site. During the first seven days of curing, blocks are to be kept permanently damp and protected from exposure to sun and wind.

Concrete blocks are to be well wetted before the pouring of concrete.

COMPOSITE FLOOR CONSTRUCTION

The hollow block floor construction is generally to be as shown on the Engineer's drawings.

Care shall be taken in placing blocks to ensure that they are set out in accordance with the details shown on the drawings and that they run truly in line without encroaching on the width of the insitu ribs.

The open ends of hollow blocks, if adjacent to concrete to be placed insitu, are to be plugged or stopped to prevent the concrete from flowing into the void and the Contractor is to include for this in his prices.

The Contractor should note that slip tiles are not to be used to the soffit of ribs and he is to take this into consideration in pricing the items of formwork to the soffit of hollow block floor construction.

Before concreting is carried out the blocks are to be thoroughly wetted.

Care should be taken during concreting that the width of ribs between the rows of blocks and the solid insitu concrete shown on the drawings adjacent to supporting beams is not encroached upon by the blocks.

It is essential that the concrete topping be poured at the same time as the ribs between hollow blocks.

Reinforcement shall be positioned accurately with required cover in accordance with the drawings and using the particular spacing blocks with wire ties as previously described. Spacer blocks shall be provided in ribs at not more than 1.2m centres. Care must be taken during concreting that the reinforcement is not displaced.

Where holes for services, etc. occur, the necessary holes or pockets shall be accommodated by the replacing of a hollow block by insitu concrete or the widening of a rib all in accordance with the Engineer's instructions.

Prices for holes, etc. through hollow block construction are to include the re-arrangement or substitution of the hollow block with sold concrete in addition to the actual formation of the hole.

CONCRETE SURFACE BEDS

Concrete for surface beds shall be Grade '20'.

Before placing concrete and where specified or shown on the drawings a layer of 500 gauge polythene or diothene sheeting shall be laid on the base course. Minimum 300mm laps shall be provided at all joints.

The concrete shall be placed as soon as possible after being mixed. In transporting the concrete, adequate precautions shall be taken to avoid damage to the prepared base. The concrete shall be spread to such a thickness that when compacted it shall have the finished thickness as specified or shown on the drawings. A layer of concrete 50mm less than the finished thickness shall first be spread and struck off at the correct level to receive the top fabric reinforcement.

The top layer shall then be added. Not more than 30 minutes shall elapse between spreading the bottom layer. The Contractor shall be responsible for maintaining the reinforcement in its correct position during the placing and compaction of the concrete.

The compaction and finishing of the concrete shall be effected by immersion vibrators and a hand or mechanical tamper weighing not less that 10Kg per meter run and having a tamping edge shod with a steel strip 75mm wide fixed to the tamper by countersunk screws. Immersion vibrator with 'spade' attachments will be permitted. Compaction shall be continued until a dense, sealed surface finish is achieved. Over-compaction causing an excessive amount of fines to be brought to the surface shall be avoided.

The surface of the concrete shall be finished to the surface texture specified to the levels, falls and crossfalls, as directed or shown on the drawings and shall be subject to the following tolerance :-

The level shall be within or - 6mm of the levels specified.

The falls shall be within 10% of the falls specified.

The smoothness shall be such that departure from a 3.000m straight edge laid in any direction shall not exceed 3mm.

Minor irregularities shall be made good by the use of a steel float but in no circumstances shall mortar be used to make good the surface.

include for all straight cutting and waste, handling, hoisting and fixing in position, providing all necessary tying wire, and supports and all extra material in laps.

Prices of all precast concrete shall include for all moulds, finishings as described, handling reinforcement, hoisting and fixing at the required levels, bedding, jointing and pointing in cement and sand (1:5) mortar, also for casting or cutting to the exact lengths required and any waste resulting from such cutting. The sizes of weathered or moulded items stated are extreme sizes.

Prices for suspended hollow tile composite floor and roof slabs must be 'all inclusive' to include for concrete hollow tiles, in situ concrete ribs, concrete topping, concrete filling to open ends of hollow concrete tiles.

Concrete in main beams has been measured to the full width thereof and for full depth to top of slab level and composite slabs are measured separately, the net area between same. No adjustment will be made in these measurements for any projection of ribs, reinforcement, etc., into main beams or floors etc., to obtain bearings, which are deemed to be covered in the Contractor's rates.

Prices for expansion joints shall include for cutting to size and all temporary supports and prices for expansion joint sealers shall include for all temporary battens or fillets required to form the necessary grooves.

STRUCTURAL STEELWORK

APPROVED SUB-CONTRACTOR

The whole of the structural steelwork is to be executed by a specialist Sub-Contractor who is to be specifically approved by the Engineer and the Contractor will be required to make arrangements for the execution of this work and bear all expenses incurred. No change in the rates for this work inserted by the Contractor in these Bills of Quantities will be allowed

ARCHITECT/ENGINEER

For the purpose of the steel structure the Structural Engineer shall be deemed vested with the duties of and be the representative of the Architect.

QUALITY OF MATERIAL AND WORKMANSHIP

The quality of all materials and workmanship used in the execution of the works shall comply with the requirements of current relevant British Standard and Codes of Practice, including all the latest amendments.

BRITISH STANDARDS AND CODES OF PRACTICE

B.S. 4360.....	Weldable Structural Steels
B.S. 5950	The use of Structural Steel inBuilding.
B.S. 4 (Part 1)	Hot Rolled Sections
B.S.4848 (Part2).....	Hot Rolled Hollow Sections.
B.S. 2994 & 1449	Cold Formed Steel Sections
B.S. 5135	General Requirements for the Metal Arc Welding of Structural Steel Tubes to B.S. 6222,(B.S. 5125 will be considered to apply to the requirements for weldingofhotrolled hollow sections to B.S. 4848 Part 2).

B.S. 6323 Parts 1 - 8	SteelTubesfor Mechanical, Structural & General Engineering Purposes.
B.S. 1856	General Requirements for the Metal Arc Welding of Mild Steel.
B.S. 639	Covered Electrodes for the Metal Arc Welding of Mild Steel
C.P. 2008	Protection of Iron & Steel Structures from Corrosion

TESTS

The Engineer may at any time require any materials to be tested in accordance with the requirements of the Standards listed above. The cost of all successful tests shall be borne by the Employer. The Contractor shall, if required by the Engineer, promptly supply at his own expense test pieces. The costs of tests on materials failing to comply with these Standards shall be borne by the Contractor. If in the opinion of the Engineer, faulty material and/or workmanship has been used in the works, the Contractor may be directed to dismantle and cut out the parts concerned and remove them for examination and testing. The cost of dismantling, cutting out and making good to the approval of the Engineer shall be borne by the Contractor.

FABRICATION

The standard of work and the general procedure to be followed during fabrication shall be in accordance with B.S. 449. The Contractor must ascertain all dimensions on the site prior to commencement of fabrication.

(a) Cutting & Bending - All members, plates, brackets, etc., shall be neatly and accurately sheared, sawn, or profiled to the required shape as shown on the drawings. Where steel is oxy-cut to shape, care shall be taken to preserve the full finished sizes required.

If members or plates are bent or set, the bends or sets shall be correctly made to the radii or angles specified without leaving hammer marks. The materials may be heated to permit this. Material that has been heated should be annealed to approval.

(b) Punching & Drilling - Holes for black bolts shall be drilled or punched 2mm larger in diameter than the bolt size. Holes for high tensile friction grip bolts shall be drilled or sub-punched and reamed to 2mm larger in diameter than the specified bolt size. All drilled holes shall be parallel sided and shall be drilled with the axis of the holes perpendicular to the surface. Badly drilled holes shall either be reamed out to approval and larger bolts fitted or otherwise as directed. All rough arrises shall be ground off. Holes for bolts in material thicker than 15mm must be drilled. When holes are drilled in one operation through two or more thicknesses of material, the parts shall be separated after drilling and all burrs removed before assembly. Holes for bolts shall not be formed by a gas cutting process. Holes formed or enlarged by oxy-cutting will not be accepted and must be filled to approval by electric welding and re-drilling.

(c) Bolting - All bolts used shall be of such length that at least one full thread is exposed beyond the nut after the nut has been tightened. Where a nut or bolt head would bear on an inclined surface, a bevelled washer of the correct shape shall be interposed between the two surfaces. Bevelled washers shall not be allowed to get out of position during fabrication and erection and for this purpose may be spot welded to the steel surface. Bevelled washers for use with high tensile bolts shall not be welded.

(i) Black Bolts, Nuts and Washers

Black bolts shall comply with the requirements of B.S. 916. (B.S.W. Threads).

(ii) Close Tolerance Bolts

Close tolerance bolts shall conform to B.S. 916.

(iii) High Strength Friction Grip Bolts

(a) General grade bolts to B.S. 3692.

(b) Load indicating bolts manufactured by G.K.N. Ltd. or any other approved manufacturer.

(c) High tensile bolts to B.S. 4395.

(iv) Rawlbolts

Rawlbolts shall be those manufactured by Rawlplug Company Ltd or any other approved manufacturer.

(v) Washers

Washers to B.S. 4320.
Washers for high strength friction grip bolts shall be appropriate to the type and quality of the bolt specified.

(vi) Rivets

The steel used for rivets shall be in accordance with B.S. 4360 and in the case of high tensile steel rivets shall be so manufactured that they can be driven and the heads formed and the physical properties not impaired.

(d)Pressed Steel Sections

Pressed or cold rolled steel purlins and girders shall be to the sizes indicated on the drawings and shall be formed from approved steel strip with a minimum yield strength of 175N/mm2.

The sections shall be manufactured straight and free from twist. The tolerance away from straightness shall not be greater than 2mm for every 2000mm in length along any folded edge.

(e) Electric Welding

All welding shall be carried out in strict accordance with the requirements of B.S. 5135 and B.S. 2624 as appropriate and electrodes shall comply with B.S. 639. Only approved and certified welders shall be used

Fusion faces shall be free from irregularities such as tears, fins, etc., which would interfere with the deposition of weld metal.

Fusion faces shall be smooth and uniform and shall be free from loose scale, slag, rust, grease, paint and other deleterious material.

All welds shall be of approved type and finished size as specified. Welding shall be carried out in such sequence that minimum distortion of the parts welded results.

Preparation of edges for welding shall be carried out by planing or machine flame cutting. Manual flame cutting will not be permitted.

Parts to be welded shall be maintained in their correct relative positions during welding, preferably by jigs.

Not withstanding any dimensioned spacing of purlin cleats, the Contrac or shall ensure hat purlin cleat spacing is satisfactory for the available stock lengths of roof sheeting. However, the Engineer's approval must first be obtained before any alteration is made in purlin spacing or sheeting sizes.

Splices in portal and other frames shall be made where shown on the details or where directed by the Engineer.

(b) Boxed Members

Abutting edges of boxed members shall be connected and sealed with a continuous weld to exclude the entrance of moisture. Where specified such welds shall be ground flush to approval.

(c) Shop Assembly

Assembly of units in the shop prior to transporting to the site must be inspected by the Engineer before painting. The assembled work shall be laid out in the shop or yard such that all parts are accessible for inspection and testing.

The Contractor shall furnish all facilities for inspection and testing of the works and must notify the Engineer on every occasion materials are ready for inspection.

(d) Marking

All members of the structures to be site assembled shall be marked in accordance with the shop details and marking plans submitted to the Engineer for approval.

ERECTION

(a) Site Dimensions

Erection shall not commence unless and until accurate site dimensions have been taken by the Contractor. No claims will be considered should site dimensions differ from those on the drawings. Any modifications to the structural steel required in order to comply with site dimensions shall be made on the ground to the Engineer's approval before erection is commenced.

(b) Safety

All erection shall be carried out by competent and experienced personnel and the Contractor shall take every care to safeguard members of the public, workmen, and adjoining property against injury and/or damage. The Contractor shall be held responsible for all damage caused to the structure, workmen, or other property during erection.

All gear used shall be of adequate strength and shall comply with all current Regulations.

During erection the work shall at all times be adequately bolted, guyed and/or braced to make the structure secure.

(c) Storage and handling

Steel members shall be stored, handled and erected in such a manner that no member shall be subjected to excessive stresses which could have adverse effect on the properties of the steel. If, in the opinion of the Engineer, the steelwork has been subjected to such treatment, the Contractor shall remove the member from the site and replace it at his own expense.

(d) Erection Notes

No member or part of a member which has been bent or distorted shall be erected in that condition. All straightening shall be done on the ground.

Stanchions shall be wedged to line and level on steel or cast iron wedges and checked by the Engineer. After acceptance, stanchion bases shall be grouted to approval before wedges are removed. Unless otherwise shown on the drawings, all stanchions shall be left truly vertical and correct to line and level. Beams, girders, etc., shall be erected level unless otherwise shown, and correctly positioned.

Trusses and open web joists shall be carefully handled at all times and during erection shall be lifted at such points and in such a manner as will preclude any possibility of damage from excessive stresses.

Packing plates, shims, washers or similar adjusting pieces found necessary to accommodate tolerances in structural site dimensions shall be provided and fixed to the approval of the Engineer.

Immediately after erection, each truss shall be made secure by purlins, bracing or guys to approval of the Engineer.

Bracing shall be fixed in position as soon as dependent portion of the work is completed.

(e) Tightening and Testing High Tensile Friction Grip Bolts

Before assembly, the contact surfaces, including those adjacent to the washers, shall be descaled, and be free from dirt, oil, loose scale, burrs, paint (except priming paint), pits and other defects that would prevent proper seating of the parts.

Bolts shall be fixed with approved hardened flat or tapered washers as required between the bolt and nut and the softer mild steel.

When bearing faces of the bolted parts have a slope of more than 1 in 20 with respect to a plane normal to the bolt axis, square smooth bevelled washers shall be used to compensate for the lack of parallelism.

All bolts shall be tightened by the 'Turn of Nut' method and as approved by the Engineer to achieve in all bolts a minimum tension equal to the proof load.

(f) Grouting

Unless otherwise detailed on the drawings, a space of not less than 40mm shall be provided between undersides of column base plates and footings, and between all beams and roof truss bearings and concrete pads.

After each column, beam or roof truss has been wedged up to a line and level and fixed in position to approval, the space between footing or pad and the underside of the column base plate or steel member shall be grouted with a mixture of one part of Portland cement and one part of approved washed sand (1:1).

The Portland cement and sand shall be thoroughly mixed together with sufficient water to produce a mixture of 'damp earth' consistency and shall be used within twenty minutes of mixing. The caulking mixture shall be packed tight into the space between baseplate and foundation and protected from damage until it sets.

PAINTING

(a) Paints

All paints are to be obtained from suppliers approved in writing by the Engineer.

Paints are to be delivered to the site or to the Contractor's fabrication site in the original containers as supplied by the manufacturer with seals unbroken and are to be used in strict accordance with the manufacturer's instructions. Manufacturer's representatives are to be free to visit the site and inspect materials for laboratory analysis.

Paints are not be thinned unless instructed by the Engineer. No external painting is to be carried out during rain or when rain is likely to occur before the paint has had time to dry. All surfaces are to be dry and free from moisture during painting.

(b) Preparation for Painting

All structural steel shall be thoroughly scraped and wire brushed to remove mill scale and rust. Dirt, grease and oil shall be washed off with white spirit and the steel allowed to dry.

(c) Application

A first coat of Red Lead Graphite Primer or other approved primer shall be applied after fabrication of the works has been completed. A minimum of 24 hours shall elapse before the steel is moved from its position after painting has been completed.
After delivery to site, the steel shall be carefully examined and all areas where the priming coat has been damaged and/or where rust has developed shall be washed with white spirit and wire brushed as necessary and a further priming coat as for the first coat applied to completely cover the damaged areas.

During erection, surfaces of steel which are to be in contact shall be painted with one further coat of primer as previously described and the surfaces brought together whilst the paint is still wet.

After erection, paint a second and finishing coat of 'Oil Company Aluminium Paint 368/36' or other finishing paint of standard as for steelwork. Welds shall not be painted over until they have been deslagged, inspected and approved.

Steel purlins and side rails shall generally be painted as for steelwork when the following specification shall be used.

1st Coat - Red Oxide Zinc Chromate Primer or other approved primer
2nd Coat - Robbialac 'Oil Company Aluminium Paint 368/36' or other equal and approved Aluminium Paint

The interior of mild steel gutters shall be prepared as previously described and painted with 2 coats of Robbialac Epilac Coal Tar Epoxy Paint or other approved paint.

PRICES, MEASUREMENTS AND PAYMENT

Prices quoted by the Contractor shall be based on the calculated weights of steel, and shall include for manufacture, painting, and supply, all as described in the Bills of Quantities, specified, and shown on the drawings, including the cost of delivery to the site or other agreed place or places and the supply of all bolts, rivets, plugs, gussets, cleats, to complete the erection of the works.

Prices shall include for erection, (all labour, scaffolding, and other erection equipment necessary) and cover the cost of additional prime coat painting as previously specified. The prices shall also include for lining up, levelling and plumbing but not for grouting up of the bases.

The basis for payment for steelwork shall be the calculated steel weights of the structure. Any variation from the original design on which the tender was based, which results in

either an increase or decrease in calculated weight of the structure as completed, shall result in the appropriate additions or deductions to the submitted tender totals.

Any written instruction from the Engineer which may result in additional work over and above that for which the Contractor quoted will be considered as extras and shall be paid for on the basis of calculated additional steel weights.

SECTION D

EXTERNAL WORKS SPECIFICATION

ARCHITECT OF ENGINEER

Whenever the word 'Engineer' is used in these descriptions of materials and workmanship, it shall, where appropriate, be read and construed as the 'Architect', Landscape Architect or, as the 'Civil Engineer' in which instance the Landscape Architect or Engineer shall be deemed vested with the duties of and be the representative of the Architect.

DISCREPANCIES IN DESCRIPTIONS

Descriptions of materials and workmanship contained in the Bills of Quantities measured items shall take precedence over descriptions contained in appendices in the event of discrepancies between the two, unless the Engineer shall otherwise direct.

TESTS AND SAMPLES

Unless otherwise described in the Bills of Quantities, the Contractor will be responsible for the costs involved in testing materials as described hereinafter. He will also be responsible for all the costs involved in supplying samples of materials or workmanship as required hereinafter to the satisfaction of the Engineer. The cost of replacing materials fixed or placed in position which do not comply with the required test results or approved samples shall be borne solely by the Contractor.

KENYA STANDARDS

All materials and goods supplied for incorporation in the works must comply with any relevant current standards issued by the Kenya Bureau of Standards.

GENERAL

The provisions of other sections of this Specification shall, where appropriate, apply to this section. The works shall be executed in accordance with consultant drawings and designs.

CONCRETE PIPES

Concrete pipes and fittings shall conform to B.S. 556 and shall have ogee or spigot and socket joints as specified in the drawings or as directed by the Engineer.

PVC SOIL SYSTEM

The Contractor shall supply and fix PVC soil pipes and fittings as indicated in the drawings. Pipes and fittings shall be in accordance with the relevant BS including BS 4514 and fixed to the manufacturer's specifications and any other particular specifications that may be issued by the Engineer during the construction period.

EXCAVATION

The excavation shall be made true and even to falls, the bottom being trimmed to the correct levels and well rammed. The minimum width of the trench at the bottom shall be the external width of the pipe plus 300mm. Wherever soft places in excavated areas are encountered, the Contractor shall excavate such soil to a hard foundation and replace with hard filling before any drains are laid. Any trenches excavated in error to a greater depth than required shall be backfilled to the required level with hard filling at the Contractor's own expense.

DRAIN RUNS

Surface water drains are to be to the diameters and of the materials as shown on the drawings, laid in straight lines and with uniform falls to the levels indicated. No alterations to the sizes, falls and runs shown on the drawings are to be made without previous consent.

JOINTING CONCRETE PIPES

Joints are to be made with best quality gaskin dipped in cement grout immediately prior to use, caulked in, and finished off to not more than one third the depth of the socket.

Pipe runs are to be laid dry and jointed in one operation with cement and sand (1:2) trowelled to a smooth face at an angle of 45 degrees to the pipes, and properly cored as the work proceeds.

Where an approved proprietory spigot and socket pipe is used, joints shall be made in accordance with the manufacturer's instructions.

BACKFILLING

No backfilling shall be carried out until drains, manholes and chambers etc., have been tested and approved. The whole of the backfilling shall be properly consolidated and shall be put back in 250mm layers. No mechanical rammers may be used until at least 600mm of consolidated material has been returned over the pipes. Only approved material may be used for backfilling. Where pipes are unprotected by concrete haunching, the first operation in filling shall be to handpack and tamp selected fine material around the lower half of the pipes to buttress them to the sides of the trench.

In the case of pitch fibre and plastic pipes, the first filling shall completely cover the pipe and shall be of material free from stones or hard material which would be retained on a 25mm sieve.

TESTING NEW DRAINS

All surface water drains will be tested to 1500mm head of water. No drains are to be covered in or further proceeded with until such test has bee made, repeated as necessary, and passed by the Architect and Local Authority.

Immediately after being laid, the kerbs and quadrants shall be haunched on back face to half their height in concrete (1:3:6 - 40mm) to the dimensions shown on the drawings.

The exposed face of kerbs and quadrants shall be not less than 100mm nor more than 105mm above the channel of the road except where it is necessary to provide an artificial fall in the channel. The exposed surfaces of the kerbs, channels and quadrants shall conform to the required gradients and curves in vertical plane and to the required plan.

Kerbs, channels and quadrants shall conform to the requirements of B.S. 340. No joint shall exceed 12mm in width. All units shall be laid true to line and level and any unit found to be more than 3mm out of line or level at either end shall be lifted and relaid.

PRECAST CONCRETE PAVING SLABS

Unless otherwise shown on the drawings or directed, precast concrete paving slabs shall comply with B.S. 368 with minimum strength.

WEED KILLER

The finished formation of the footways and roads shall, where directed by the Architect, be sprayed with a persistent total herbicide 'Telvar' W or other equal and approved, at the rate of 4 Kg per hectare. The application shall be evenly sprayed in a high volume of water at about 100 to 200 litres per hectare.

PRECAST CONCRETE BLOCKS PAVING

Precast Concrete block paving shall be laid in sand on properly prepared and compacted sub-base as for in-situ concrete or asphalt concrete.

Blocks shall be fitted close together in a pattern approved by the Architect and boundaries shall be restrained by edge channels or kerbs before vibrating begins.

Blocks thickness and characteristic strengths shall be as measured in the Bills of Quantities.

Blocks shall be laid by hand 20 to 30mm above finished level on levelled, unconsolidated sand 50mm thick before compaction and the paving shall be compacted using a plate vibrator. Fine sand shall be brushed into the joints before and after compacting.

After compacting the surface level shall be within 5mm of the specified level and the level of any two adjacent blocks shall not differ by more than 2mm.

PRIME COST AND PROVISIONAL SUMS PREAMBLES

The Contractor shall include the Prime Cost and Provisional Sums for each Bill in his tender. These sums shall be expended as directed by the Architect or deducted in whole or in part if not required. Work executed in respect of Provisional Sums shall be measured and valued by the Quantity Surveyor in accordance with the Conditions of Contract.

The Contractor will be responsible for the administration of all Nominated Suppliers in accordance with the Conditions of Contract and will be required to arrange an approved programme for delivery of materials with each firm.

The Contractor will be responsible for the supervision and administration of all Nominated Sub-Contractors in accordance with the Conditions of Contract and will be required to arrange an approved programme with each firm.

The Contractor shall allow for general attendance upon Nominated Sub-Contractors and for affording them all reasonable specific attendance and facilities for carrying out their works simultaneously with his own and shall add to prime cost sums for each or all of the following items or any other item which he considers necessary :-

(a) Profit and overhead cost

(b) Supplying all necessary full size setting out templates

(c) Giving all necessary dimensions and taking responsibility for their accuracy.

(d) Unloading or assistance in unloading of materials, getting in and hoisting in position

(e) Providing all necessary working space and providing space for storage accommodation which the Nominated Sub-Contractors will erect for themselves.

(f) Allowing the free and full use of all scaffolding, ladders, hoists, trestles, scaffold boards and all plant of a similar nature belonging to or provided by the Contractor while it remains erected on the site. Any further scaffolding required shall be the Nominated Sub-Contractor's responsibility and he shall pay the cost thereof unless otherwise stated.

g) Supply of water and supply of temporary lighting and of electric power, as more specifically described in Bill No. 1 under 'Water for the Works' and 'Lighting and Power for the Works' respectively.

(h) Providing all necessary latrine accommodation as more specifically described in Bill No. 1 under 'Sanitation of the Works'.

(i) Removing ad replacing duct covers, pipe casings etc., as necessary for the execution and testing of Nominated Sub-Contractor's work.

Provision is made after each Prime Sum Cost for the pricing of the foregoing under two headings:-

'Add for Profit' should include (a)

'Allow for Attendance' should include (b) to (i) and any other expenses involved in compliance with the preambles of this Appendix.

Builder's work in connection has been measured separately unless otherwise described or unless any particular Sub-Contractor has been instructed to execute his own builder's work. Where work in connection is required from the Contractor, he must obtain particulars of positions in which chases, holes, mortices, etc., will be required so as to avoid unnecessary cutting away. No claim will be considered for the extra cost of cutting away work already built as a result of the Contractor's failure to obtain sufficient particulars beforehand.

Any percentage addition made by the Contractor against an item of 'Add for Profit' beneath a Prime Cost Sum will be deducted from the Contract Sum and in lieu thereof he will be paid the said percentage of the actual amount directed to be expended in respect of that particular Prime Cost Sum.

SECTION F

PLUMBING, DRAINAGE AND FIRE FIGHTING

INSTALLATIONS SPECIFICATION

1 PART B

1.1 GENERAL MECHANICAL SPECIFICATION

1.1.1 GENERAL

This section specifies the general requirements for plant, equipment and material forming part of the Sub-Contract Works and shall apply except where specifically stated elsewhere in the specification or on the contract Drawings.

1.1.2 QUALITY OF MATERIALS

All plant, equipment and materials supplied as part of the Sub-contract works shall be new and of first-class commercial quality, shall be free from defects and imperfections and where indicated shall be of grades and classifications designated herein.

All products or materials not manufactured by the Sub-contractor shall be products of reputable manufacturers and so far as the provisions of the Specification is concerned shall be as if they had been manufactured by the Sub-contractor.

The Sub-Contractor as called for by the Specification and Contract Drawings shall supply materials and apparatus required for the complete installation unless mention is made otherwise.

Materials and apparatus supplied by others for installation and connected by the Sub-Contractor shall carefully be examined on receipt and stored. Should any defects be noted, the Sub-Contractor shall immediately notify the Engineer

Defective equipment or that damaged in the course of installation or tests shall be replaced as required to the approval of the Engineer.

1.1.3 REGULATIONS AND STANDARDS

The Sub-Contract Works shall comply with the current edition of the following:-

i) The Kenya Government Regulations
ii) The United Kingdom Institution of Electrical Engineering (*IEE*) Regulations for the electrical equipment of buildings.
iii) The United Kingdom Chartered Institute of Building Services Engineers (*CIBSE*) Guides.
iv) British Standards and Codes of Practice as published by the British Standards Institution (*BSI*).
v) The Local Council By-laws.
vi) The Electricity supply Authority By-Laws.
vii) Local Water Authority By-Laws.
viii) The Kenya Building Code of Regulations.

1.1.4 ELECTRICAL REQUIREMENTS

Plant and equipment supplied under this Sub-Contract shall 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 a main isolator.

The supply power up to and including local isolators shall be provided and installed by the Electrical Sub-Contractor. All other wiring shall be as described in the "Particular Specification".

The Sub-Contractor shall supply three copies of all schematic, cabling and wiring diagrams for the Engineer's approval.

The starting current of all electric motors and equipment shall not exceed the maximum permissible starting currents described in Kenya's power utility Company's 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 volts, 50Hz, 3-phase or 240 volts, 50Hz 1-phase as specified in the "Particular Specification".

The Consultant may reject any equipment that is not rated for the above voltages and frequencies

1.1.5 TRANSPORT AND STORAGE

All plant and equipment shall, during transportation be suitably packed, crated and protected to minimise the possibility of damage and to prevent corrosion or other deterioration.

On arrival at site, all plant and equipment shall be examined and any damage to parts and protective priming coats made good before storage or installation.

Adequate measures shall be taken by the Sub-Contractor to ensure that plant and equipment do not suffer any deterioration during storage.

Prior to installation all piping and equipment shall be thoroughly cleaned.

If, in the opinion of the Consultant any equipment has deteriorated or been damaged to such an extent that it is not suitable for installation, the Sub-Contractor shall replace this equipment at his own cost.

1.1.6 SITE SUPERVISION

The Sub-Contractor shall ensure that there is an English-speaking supervisor on the site at all times during normal working hours.

1.1.7 INSTALLATION

Installation of all special plant equipment shall be carried out by the Sub-Contractor under adequate supervision from skilled staff provided by the plant and equipment manufacturer or his appointed agent in accordance with the best standards of modern practice and to the relevant regulations and standards described under Clause 3 of this section.

1.1.8 TESTING

3.1.8.1 GENERAL

The Sub-Contractor's attention is drawn to Part "A", Sub-Clauses 2.1.44 and 2.1.45 on Pages 2.11 and 2-12 respectively of the "Preliminaries and General Conditions".

The following sub-clauses are intended to define the Sub-Contractor's responsibilities with respect to testing and inspection.

3.1.8.2 MATERIAL TESTS

All material for plant and equipment to be installed under this Sub-Contract shall be tested, unless otherwise directed, in accordance with the relevant B.S. specification concerned.

For materials where no B.S. specification exists, tests are to be made in accordance with the best modern commercial methods to the approval of the Engineer, having regard to the particular type and application of the materials concerned.

The Sub-Contractor shall prepare specimens and performance tests and analyses to demonstrate conformance of the various materials with the applicable standards.

If stock material, which has not been specifically manufactured for the plant and equipment specified is used, then the Sub-Contractor shall submit satisfactory evidence to the Consultant that such materials conform to the requirements stated herein in which case tests of material may be partially or completely waived.

Certified mill test reports of plates, piping and other materials shall be deemed acceptable.

3.1.8.3 MANUFACTURED PLANT AND EQUIPMENT - WORKS TESTS

The rights of the Consultant relating to the inspection, examination and testing of plant and equipment during manufacture shall be applicable to the Insurance Companies or Inspection Authorities so nominated by the Engineer

The Sub-Contractor shall give two weeks' notice to the Consultant of the manufacturer's intention to carry out work tests and inspections.

The Consultant or his representative shall be entitled to witness such tests and inspections. The costs of such tests and inspections shall be borne by the Sub-Contractor.

Six copies of all test and inspection certificates and performance graphs shall be submitted to the Consultant for his approval as soon as possible after the completion of such tests and inspections.

Plant and equipment which is shipped before the relevant test certificate has been approved by the Consultant shall be shipped at the Sub-Contractor's own risk and should the test and inspection certificates not be approved, new tests may be ordered by the Consultant at the Sub-Contractor's expense.

3.1.8.4 PRESSURE TESTING

All pipe work installations shall be pressure tested in accordance with the requirements of the various section of this specification. The installations may be tested in section to suit the progress of the works but all tests must be carried out before the work is buried or concealed behind building finishes. The Consultant or his representative must witness all tests and the Sub-Contractor shall give 48 hours' notice to the Consultant of his intention to carry out such tests.

Any pipe work that is buried or concealed before witnessed tests have been carried out shall be exposed at the expense of the sub-contractor and the specified tests shall then be applied.

The Sub-Contractor shall prepare test certificates for signature by the Consultant and shall keep a progressive and up-to-date record of the Sections of the work that have been tested.

1.1.9 COLOUR CODING

Unless stated otherwise in the Particular Specification all pipe work shall be colour coded in accordance with the latest edition of B.S. 1710.

1.1.10 WELDING

3.1.10.1 PREPARATION

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

3.1.10.2 METHOD

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

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

3.1.10.3 WELDING CODES AND CONSTRUCTION

All welded joints shall be carried out in accordance with the following specification:-

a) Pipe Welding
   All pipe welds shall be carried out in accordance with the requirements of B.S.806.
b) General welding
   All welding mild steel components other than pipe work shall comply with the general requirements of B.S. 1856.

3.1.10.4 WELDERS QUALIFICATIONS

Any welder employed on this Sub-contract shall have passed the trade tests as laid down by the Government of Kenya.

The Consultant may require seeing the appropriated certificate obtained by any welder and should it be proved that the welder does not have the necessary qualifications the Consultant may instruct the Sub-Contractor to replace him by a qualified welder.

2 PART C

2.1 GENERAL PLUMBING AND DRAINAGE SPECIFIC TIONS

2.1.1 MATERIALS AND STANDARDS

4.1.1.1 GENERAL

This section specifies the general requirements for plant, equipment and materials forming part of the Plumbing and Drainage Installations.

4.1.1.2 PIPE WORK AND FITTINGS

Pipe materials are to be used as follows:-

4.1.1.2.1 PLUMBING

The pipe materials for Hot and Cold Water Mains shall be Chlorinated polyvinyl chloride (CPVC) or Polyvinyl chloride (PVC) or Un-plasticised Polyvinyl chloride (u-PVC) or Polypropylene random copolymer (PPR-C) or Galvanised mid steel (GMS) medium or heavy grade or Galvanised Cast Iron (GI) or any other, as can be specified in the Bills of Quantities and on the drawings.

a) Chlorinated polyvinyl chloride (CPVC)

The Chlorinated polyvinyl chloride (CPVC) pipes to conform to ISO 4422, ASTM D. or the relevant Kenya Standard.

Fittings shall comply in all respects with ASTM F or the relevant Kenya Standard. Pipes shall be supplied in plain-ended lengths.

1. Thickness

The Minimum acceptable wall thickness of pipe and fittings shall be as follows:-

Nom. Dia. (*mm*)	15	20	25	32	40	50	63	75
Thickness (*mm*)	1.7	1.9	2.5	3.1	3.7	4.9	7.0	7.6

2. Jointing

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

3. 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 and either side of the concrete.

4. Workmanship

The installation method of jointing shall be done by applying correct adhesive solution at cleaned surfaces to be joined; and both jointing and fixing shall comply in all respects to the manufacturer' site-work instructions. The maximum intervals between pipe supports shall be as follows:-

i) at 21°C

Pipe Diameter (mm)	15	20	25	32	40	50	63	75	100
Horizontal & Vertical (m)	1.68	1.68	1.83	1.89	2.13	2.13	2.44	2.44	2.74

ii) at 49°C

Pipe Diameter (mm)	15	20	25	32	40	50	63	75	100
Horizontal & Vertical (m)	1.37	1.52	1.68	1.83	1.83	2.98	2.29	2.28	2.59

iii) at 71°C

Pipe Diameter (mm)	15	20	25	32	40	50	63	75	100
Horizontal & Vertical (m)	0.91	0.91	1.07	1.07	1.07	1.22	1.37	1.37	1.52

iv) at 82°C

Pipe Diameter (mm)	15	20	25	32	40	50	63	75	100
Horizontal & Vertical (m)	0.76	0.76	0.91	1.07	1.07	1.07	1.22	1.22	1.37

Pipes passing through walls or floors shall be sleeved to allow unrestricted movements.

The works shall be inspected and tested during installation and all work, which will be concealed, shall be tested before it is finally enclosed and verified by the Clerk of Works.

Any other test may be demanded upon completion for soundness and performance to the satisfaction of the Local Water Authority.

5. 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.

6. Supports to Fittings

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

7. 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 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.

8. Testing

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

b) Polypropylene random copolymer (PPR-C)

The Polypropylene random copolymer (PPR-C) pipes to conform to ISO /R1133, DIN. or the relevant Kenya Standard.

Fittings shall comply in all respects with DIN or the relevant Kenya Standard. Pipes shall be supplied in plain-ended lengths.

1. Thickness

The Minimum acceptable wall thickness of pipe and fittings shall be as follows:-

i) PN20

Out. Dia. (*mm*)	20	25	32	40	50	63	75	90
Thickness (*mm*)	3.4	4.2	5.8	6.7	8.4	10.5	12.5	15.0

ii) PN16

Out. Dia. (*mm*)	20	25	32	40	50	63	75	90
Thickness (*mm*)	2.8	3.5	4.5	5.6	6.9	8.7	10.4	12.5

iii) PN25

Inner pipe	**Out. Dia. (*mm*)**	20	25	32	40	50	63
	Thickness (*mm*)	3.4	4.2	5.8	6.7	8.4	10.5
Aluminium	**Thickness (*micron*)**	200	200	200	200	200	200
Outer coat	**Out. Dia. (*mm*)**	21.8	26.8	33.8	41.8	51.8	64.8
	Thickness (*mm*)	0.5	0.5	0.5	0.5	0.5	0.5

2. Jointing

The method of jointing to be employed shall be that of fusion welding, using the correct welding machine or an electric welder and suitable electric couplings. Seal rings joints shall be introduced where it is necessary to accommodate thermal expansion.

3. 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 and either side of the concrete.

4. Workmanship

The installation method of jointing shall be fusion welding; and both jointing and fixing shall comply in all respects to the manufacturer' site-work instructions. The maximum intervals between pipe supports at 100°C shall be as follows:-

Pipe Diameter (mm)	10	15	20	25	32	40	50	75	100
Horizontal (m)	0.75	0.90	1.05	1.20	1.35	1.65	1.80	DO	DO
Vertical (m)	1.50	1.80	2.10	2.40	2.70	3.30	3.60	DO	DO

Pipes passing through walls or floors shall be sleeved to allow unrestricted movements.

The works shall be inspected and tested during installation and all work, which will be concealed, shall be tested before it is finally enclosed and verified by the Clerk of Works.

Any other test may be demanded upon completion for soundness and performance to the satisfaction of the Local Water Authority.

5. 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.

6. Supports to Fittings

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

7. 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 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.

8. Testing

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

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

All P.V.C. pipes and fittings shall be manufactured in accordance with B.S. 3505:1968 or the relevant Kenya Standard.

Fittings shall comply in all respects with British Standard 4346 Part 1: 1969 or the relevant Kenya Standard. Pipes shall be supplied in plain-ended lengths.

1. Thickness

The Minimum acceptable wall thickness of pipe and fittings shall be as follows:-

Nom. Dia. (*mm*)	10	12	20	25	32	40	50	75	100
Thickness (*mm*)	1.5	1.7	1.9	2.2	2.7	3.1	3.9	5.7	7.3

2. Jointing

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

3. 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 and either side of the concrete.

4. Workmanship

The installation method of jointing shall be solvent welding; and both jointing and fixing shall comply in all respects to the manufacturer' site-work instructions. The maximum intervals between pipe supports at 200C shall be as follows:-

Pipe Diameter (mm)	10	15	20	25	32	40	50	75	100
Horizontal (m)	0.75	0.90	1.05	1.20	1.35	1.65	1.80	DO	DO
Vertical (m)	1.50	1.80	2.10	2.40	2.70	3.30	3.60	DO	DO

Pipes passing through walls or floors shall be sleeved to allow unrestricted movements.

The works shall be inspected and tested during installation.

All work, which will be concealed, shall be tested before it is finally enclosed and verified by the Clerk of Works.

Any other test may be demanded upon completion for soundness and performance to the satisfaction of the Local Water Authority.

5. 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.

6. Supports to Fittings

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

7. 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 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.

8. Testing

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

d) Galvanised Mild Steel Pipe work

Galvanised mild steel pipe work shall be manufactured to comply in all respects with the standards described for black steel pipe work in paragraph 2.1.3 above.

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

e) Black steel Pipe work

All black steel pipe work up to 65 mm nominal bore shall be manufactured in accordance with B.S. 1387 Medium Grade, with tapered place threads in accordance with BS 21. All fittings shall be of malleable iron and manufactured in accordance with BS 143.

Pipe joints shall be screwed and socketed and sufficient couplings union 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 Consultant.

All black steel pipe work, 80mm nominal bore up to 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 joining of pipes to valves and other items of plant.

All flanges shall comply with the requirements of BS 10 to the relevant classification contained hereinafter under section C of the Specification

f) Copper Tubing

All copper tubing shall be manufactured in accordance with BS 2871 from C.160 “Phosphorus De-oxidized Non-Arsenical Copper" in accordance with BS 1172.

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

Short copper connections tubes between galvanised pipe work and sanitary fitments 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 connection in any other way than by the use of copper tubing, then a brass straight connector shall be positioned between the galvanised pipe and the copper tube in order to prevent direct contact.

4.1.1.2.2 DRAINAGE

a) Mu-PVC Waste Systems

All pipes and fittings shall be manufactured in accordance with B.S. 5255:1968 or the relevant Kenya Standard.

Pipes shall be supplied in plain-ended lengths.

1. Thickness

The Minimum acceptable wall thickness of pipe and fittings shall be as follows: -

Size (*in*)	**Size (*mm*)**	**Pipe and Fittings Wall Thickness (*m*m)**
1¼	32	1.8
1½	40	1.9
2	50	2.0

2. Jointing

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

3. 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 and either side of the concrete.

4. Workmanship

The installation method of jointing shall be solvent welding; and both jointing and fixing shall comply in all respects to the manufacturer' site-work instructions. The maximum intervals between pipe supports at 200C shall be as follows:-

Nominal Size (*in*)	**Nominal Size (*mm*)**	**Horizontal (*mm*)**	**Vertical (*mm*)**
1¼	32	500	1,200
1½	40	500	1,200

Jointing of pipe shall be carried out by means of solvent welding in accordance with the manufacturer's instructions and B.S. 5572: 1978.

Jointing of pipe 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,

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

c) 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 British Standards, including B.S. 45l4 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, fixed to suit pan outlet.

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 Gully Trap on Drain Trap as indicated on the drawings.

d) u-PVC Square Rainwater System Pipe and Gutter

Gutters shall be a rectilinear section 116mm or 137mm wide and shall be supplied in plain-ended lengths with the minimum acceptable wall thickness of gutter shall be 2.20mm.

Rainwater pipes shall be square in section 58mm or 75 mm internal diameter and shall be supplied in plain-ended lengths with the minimum acceptable wall thickness or rainwater pipes shall be 1.80mm.

Pipe support brackets must be adequate to screen expansion gaps.

The grade of u-PVC used for gutter and pipe shall have a minimum softening point of 75°C when tested by the Vicat method as described in B.S, 2782.

The pipe and gutter shall be colour grey, to BS 5252, 10.A.07, black, white or rustic.

e) u-PVC Rainwater Fittings

All fittings shall be injection moulded and shall be compatible with pipe and gutters and shall conform to BS 4576 or the appropriate Kenya Standard.

All gutters, pipe and fittings shall be colour grey to British Standard 5252, 10.A.07, or black, white or rustic.

Gutter connecting fittings shall have integrally moulded seal retaining cavities housing a rubber seal of hollow section.

The fitting shall incorporate a gutter-retaining clip.

Gutter shall be supplied in plain-ended lengths.

The minimum acceptable wall thickness of gutter shall be 2.20mm.

Rainwater pipes shall be circular in section, 65mm nominal diameter complying in all respects to British Standard 4576 or the relevant Kenya Standard.

Rainwater pipes shall be supplied in plain-ended lengths. The minimum acceptable wall thickness of rainwater pipes shall be 1.80mm

Pipe support brackets must be adequate to screen expansion gaps.

The grade of u-PVC used for gutter and pipe shall have a minimum softening point of 75oC when tested by the Vicat method as described in B.S. 2782.

The pipe and gutter shall be colour grey, to BS 5252, 10.A.07, black, white or rustic.

f) u-PVC Underground Drainage System

1) Pipes and fittings

The pipes and fittings shall comply in all respects to British Standard 4660 & 5481 or the relevant Kenya Standards.

Pipes shall be supplied in plain-ended lengths.

The minimum acceptable wall thickness of pipe and fittings will be as follows:-

Item	Description	Minimum Acceptable Wall Thickness	
1	110mm pipe	3.0mm	
2	160mm pipe	3.9mm	
3	110mm junction only	3.50mm socket	3.80mm body
4	All other fittings	3.20mm socket	3.40mm body
5	160mm all fittings	4.30mm socket	4.70mm body

The method of jointing to be employed shall be by lip seal socketted fittings. Jointing to other materials shall be made in the manner specified by the manufacturer.

The grade of u-PVC used for the pipe shall have a minimum softening point of 82°C when tested by the `Vicat` method 102D as described in British Standard 2782, and for fittings 79°C.

The pipe and fittings shall be of colour golden brown approximating to British Standard 381C:No.414. The seal retaining caps shall be black polypropylene.

The natural rubber for lip seal joints shall be to British Standard 2494:1976.

Holder bats shall be made of mild steel protected from corrosion by galvanising or search coating for optimum fit to pipe supports a special purpose made P.V.C. packing pieces may be used.

The base of soil and vent stack connection to the below ground drain shall be made with a bend of minimum centre line radius of 250mm.

Minor changes of direction where permitted shall be made with a variable bend that has a constant effective length

2) Excavation of Trenches

The installation, method of jointing shall conform in all respects to the manufacturer's site work instruction.

Trenches shall be excavated to a sufficient depth to allow a 50mm minimum bed below the underside of the pipe. Trench width shall be not less than the outlet diameter of the pipe plus 300mm and not wider than necessary.

3) Trench Invert

The base of the trench shall be such that even support is given to the pipe for its full length. Soft spots shall be removed and replaced with compacted granular material as described below. High spots and rock shall be removed to allow full 50mm bed depth.

4) Pipe bed

The bed shall be composed of granular material to the specification called for below and shall for below and shall cover the full trench width and length and boned to gradient

5) Laying and jointing

Pipes and fittings shall be laid true to gradient in straight lines and jointed in accordance with manufacturer's instructions. All pegs used for alignment and other purposes must be removed after use and before side filling. All joints shall be watertight complying with CP.301, Clauses 5:3.

Pipe barrels shall be in continuous contact with the trench bed when laid.

6) Side Filling

The side filling of pipes shall be composed of hard granular material, which shall be to the requirements below.

Side fillings must be placed equally on both sides of the pipe and compacted, so as to buttress the pipes against the trench walls. Side filling shall continue up to pipe crown level as a minimum and above this level if required by the Engineer.

7) Back Filling

The first 300mm of backfill above crown level shall be taken from selected trench spoil all passing 25mm sieve. It shall be placed in two 150mm layers each firmly tramped. Above the 300mm level mechanical filling and compaction may be used.

Where cover is less than 450mm the pipe shall be covered with 75mm of selected material laid to support a concrete tile or slab indicating the presence of a service.

8) Granular Material for Bed and Side Fill

All material for bed and side fill shall be hard and granular passing 20mm sieve and shall contain no more than 5 per cent fines passing 3mm sieve.

The material may be composed of crushed stone, clinker, quarry scalping, ballast, gravel, shingle or all-in aggregate to British Standard 882.

The material shall have a compaction factor of 0.3 or less.

g) Concrete Pipe

Where concrete pipe and fittings are used in connection with the conveyance surface water of sewage under atmospheric pressure, they shall be manufactured in accordance with the requirement of B.S. 556, Class l, except where

The joints of concrete pipe and fittings may be one of the following depending application and conditions:

1) Flexible spigot and socket type.
2) Flexible rebated type (Storm water drainage only)
3) Ordinary spigot and socket type.
4) Ordinary rebated type (*Storm water drainage only*)

Joints (*1*) and (*2*) 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 (*3*) and (*4*) shall be made with approved cement mortar mix.

h) Pitch Fibre Pipe work

Pitch Fibre Pipe work and fittings for use 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 tapered joints manufactured in accordance with B.S. 2760.

Until such time as the use of pitch impregnated fibre 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.

4.1.1.3 VALVES

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

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

b) Gate Valves

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

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

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

c) Globe Valves

All globe valves up to and including 65 mm 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 requirement 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 follow:-

Item	Description	Maximum (Bar)
1	Low Pressure	3.52
2	Medium Pressure	7.72
3	High Pressure	12.62

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

f) Manually Operated Mixing Valves

Mixing valves for shower fittings and other appliances being provided under the Sub-contractor Works shall be manufactured in accordance with the requirements of B.S. l4l5 from bronze or other corrosion resistant materials.

4.1.1.4 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 B.S. 1291.

b) Anti-Siphonic Traps

Where anti-siphon traps are specified, these shall be similar or equal to the range of traps manufactured by Greenwood and Hughes Ltd., Deacon Works Littlehampton, Sussex, England.

The trade name for traps manufactured by this company is "Grevak".

4.1.1.5 PIPE SUPPORTS

a) General

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

The variety and type of support shall be kept to a minimum 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 supply and install all steelwork forming part of the pipe support assemblies and shall be responsible for making good any damage to builders work associated with the pipe support installation.

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

The Sub-Contractor shall submit all his proposals for pipe supports to the Consultant 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 support spacing in meters for steel and copper pipe and tube is given in the following table for horizontal runs.

Size Nominal Bore (mm)	Copper Tube To BS 659 (m)	Steel Tube To BS 1387 (m)
15	1.25	2.0
20	2.0	2.5
25	2.0	2.5
32	2.5	3.0
40	2.5	3.0
50	2.5	3.0
65	3.0	3.5
80	3.0	3.5
100	3.0	4.0
125	3.5	4.5
150	4.5	5.5

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

c) Cast Iron and Asbestos Cement Spigot and Socket Jointed Pipes

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

When holder bats are used, they shall conform to the requirements of B.S. 4l6.

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

d) Asbestos Cement Pressure Pipes

Asbestos Cement pressure pipes with either cast iron detachable joints or asbestos cement screw joints shall be supported and anchored on either side of the joint. The joint shall remain free.

Pipe hangers and trapeze type supports shall not be suitable for the suspension of asbestos pressure pipes unless they are designated with suitable restrictions to prevent swinging while at the same time providing the necessary support requirements.

Within building, asbestos pressure pipes shall be carried either on concrete support on rigidly fixed Steel wall brackets.

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

e) Concrete and Pitch Pipes

These pipes shall not be used for above ground application.

f) Expansion Joints and Anchors

Where practicable, cold pipe work systems shall be arranged with sufficient bends and changes of direction to absorb pipe expansion providing 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 and asbestos cement pipes in order to ensure that the 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 Consultant 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 supply flexible joints to prevent vibrations and other movements being transmitted from pumps to piping systems or vice versa.

4.1.1.6 SANITARY APPLIANCES

All Sanitary appliances supplied and installed as part of the Sub-Contract works shall comply with the general requirements of B.S. Specification.

4.1.1.7 PIPE SLEEVES

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

2.1.2 **INSTALLATION**

4.1.2.1 GENERAL

Installation of all pipe work, 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.

4.1.2.2 ABOVE GROUND INSTALLATION

a) Water Services

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

Where falls are not shown on the contract Drawings or stated elsewhere in the Specification, pipe work shall be installed parallel to the line of the buildings and as close to the walls, ceilings, 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 use 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 each from a short stepladder, extension spindles with floor or wall pedestals shall be provided.

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

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

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

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

b) Sanitary Services

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

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

The Sub-contractor shall provide all necessary rodding and inspection facilities within the draining system in position where easy accessibility is available.

Where a branch requires rodding facilities in a position to which normal access in 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 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.

c) 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.

4.1.2.3 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

1) Setting out

As described in B.S. Code of Practice 301 Cause 502.

2) Breaking Up Surface (If in Roads)

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

3) Excavation and Timbering

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

Excavation shall be made to such depths and dimensions as may be required by the Consultant to obtain prior fall and firm foundations. No permanent construction shall be commenced on any bottom until the excavation to the correct level with concrete I: 4: 8 to
38 mm maximum aggregate sizes.

The Sub-contractor's price shall have included for excavating in all materials met with, for trimming bottoms to the necessary falls and for any extra excavation required for planking, strutting and working space.

The Sub-contractor shall keep the whole of the trenches or other excavation free from water and shall execute such works and install such pumps as may be necessary to keep the excavation dry at all times.

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

4) Laying of Concrete Beds or Other Support for Pipes (*if required*)

As described in B.S. code or practice 301 clauses 504 and the following:-

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

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

5) Pipe Laying and Jointing

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

Pitch fibre drainpipe shall be laid, jointed and cut in accordance with the requirement 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.

6) Manholes

i) General

All manholes provided under the Sub-contract works shall be constructed or approved materials and in an approved manner.

All manholes shall be watertight and if constructed of brickwork, solid block work or stonework, they shall be rendered internally with a cement mortar of at least l2mm thickness and finished with a smooth surface.

The sides of all channels in every manhole shall be brought up vertically to a height of not less than the diameter of the drain and shall be benched in good concrete from the top of the channels at an angle of 30 degree to the horizontal and floated to a smooth hard surface with a coat of cement mortar.

In all other respects, manholes shall be constructed in accordance with B.S. code of practice 301.

ii) Rectangular and Square Manholes

Rectangular and square straight through manholes shall be constructed from brickwork, solid blockwork, stonework and concrete to comply with the following minimum internal dimensions (*millimeters*).

Depth below Ground of Outgoing Invert	Internal Access Shaft Dimensions L X W	Size of Main Shaft Diameter	Internal Chamber Dimensions L X W	Height of Chamber above Benching	Wall Thickness
Up to 740	-	100 to 150	610x460	-	150
Up to 740		230 to 460	760x760		150
Up to 1200		100 to 150	760x760		150
160 to 1200	-	230 to 460	910x910	-	150
1220 to1800	-	100 to 150	910x910	-	150
1220 to 1800	-	230 to 460	1070x910	-	150
1830 to 4550	760x760	100 to 150	1370x910	1370	230
1830 to 4550	760x760	230 to 460	1370x1070	1370	230
4570 & Over	760x760	100 to 150	1370x1140	1680	230
4570 & Over	760x760	230 to 460	1370x1140	1680	230

When branches are connected into the manhole, the length and width dimensions of the chamber shall be increased as follow: -

Length

Branch Diameter

l00mm 300mm/branch on the side with most branches.

150mm 380mm/branch on the side with most branches.
230 and 300mm 460mm/branch on the side with most branches.
460mm 610mm/branch on the side with most branches.

Width

Branch Diameter

100mm to 300mm for each side with branches plug
160mm 460mm or the diameter of the main drain whichever is the greater.

iii) Precast Concrete Circular Manholes

Where specified straight through precast concrete manholes shall be manufactured and constructed to comply with B.S. 556 and the following dimensional requirements (Dimensions in Millimetres).

Depth Ground Of Outgoing Invert	Internal Access Shaft Diameter	Size Main Channel Diameter	Chamber Diameter	Height Chamber Above Benching
Up to 740	-	100 to 460	910	-
760 to 2410	-	100 to 460	1070	-
2440 to 4550	760	100 to 460	1220	1370
4570 & over	760	100 to 460	1370	2680

When branches are connected into manholes the internal diameter of the chamber shall be increased, as necessary, up to a maximum chamber diameter 1830mm.

iv) Step Irons and Covers

Access shaft to manhole of depths greater than 760mm shall be provided with approved step irons as suitable intervals.

Every manhole or manhole access shaft shall be fitted with a removable airtight cast iron cover to adequate size and strength, fixed in a manner that prevents surface water gaining access into the drainage system.

Cast manhole covers and frames shall be manufactured in accordance with the requirements of B.S. 497 and shall generally fall into the following categories:-

Heavy Duty	:	For Carriageways
Medium Duty	:	For Footpaths
Light Duty	:	For domestic premises or other places where they do not have to carry wheeled traffic.

v) Back Drop Connections

Where the level of the branch drain entering the manhole is higher than can be suitably accommodated by the normal type benching, then the branch drain shall be connected to the manhole by means of a back drop or practice 301.

vi) Channels

Where the branch channel connects to the main channel in the manhole, the invert of the branch channel shall be a minimum of 38mm higher than the main channel.

7) Testing of Pipelines

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

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

8) Concrete Bedding, Hunching and Surround

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

9) Backfilling

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

10) Reinstatement of Surface

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.

Where excavation have been carried out in public highways or other areas are not forming part of the site, the Sub-Contractor shall be deemed to have allowed in his price for all charges associated with the temporary and final reinstatement requirements of the local of highway Authority, whether this is carried out by the Sub-contractor or by the Authority concerned.

No Claims for extra in this respect will be accepted.

11) Sewer Connection

The Sub-contractor shall pay all charges associated with the connection by the local Authority of the drainage to the Main sewer, including necessary reinstatement.

2.1.3 TESTING AND INSPECTION

4.1.3.1 SITE TESTS - PIPE WORK SYSTEMS

a) Underground Water Mains

After laying, jointly and anchoring, the main 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 section 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 if 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 support 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 (1½) times the design working pressure.

If preferred, the Sub-contractor may test the pipelines in section. 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 Consultant.

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 repaired or replaced at the Sub-contractor's expenses.

c) Underground Drainage System

A site test shall be carried out on all drainage pipes before concrete hunching 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 the 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 the test 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 10,360mm head at any point in the section.

The test pressure shall be maintained for a 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, drainpipe runs shall also 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 Practise 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 1972.

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

Pressure tests shall be carried out before any work, which is to be concealed, is finally enclosed.

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

4.1.3.2 SITE TEST - PERFORMANCE

Following satisfactory pressure test on the pipe work system, operational tests 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, control, fittings, equipment and plant are functioning correctly to the satisfaction of the Engineer.

All hot water pipe work shall be installed with preformed 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 "seating", due to condensation will cause nuisance.

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

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

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

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 and 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 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.

The Sub-contractor shall be deemed to have included in his price for all test pumps, and other equipment required under this clause of the specification.

The test pressure shall be one and a half times the maximum working pressure except where a pipe is manufactured from a material for which the relevant B.S. specification designates a maximum test pressure as in the case of cast or spun iron pipes, where the test pressure should not exceed 120, 180 and 240 meter/head of clause B, C or D pipes, respectively.

2.1.4 STERILIZATION OF HOT AND COLD WATER SYSTEMS

All underground water mains and above ground water distribution system, cisterns, tanks, calorifiers, pumps, etc. shall be thoroughly sterilized and flushed out after the completion of all tests of all tests and before being fully commissioned for handover.

The sterilization procedures shall be carried out by the Sub-Contractor in accordance with the requirements of B.S. code of practice 310, clause 409, to the approval of the Engineer.

2.1.5 WATER MAINS

4.1.5.1 PIPING

All piping shall be plain ended and suitable for use with flexible mechanical couplings (e.g. Viking Johnson, Dresser or Gibault). Steel pipes shall comply with B.S. 534 - Galvanized Steel Pipes for distribution system shall comply with B.S. 1387 - 1967 medium tubes and be supplied with flanges on pipes 75mm diameter and over.

On pipes less than 75mm diameter pipes shall be screwed and socketed, unless otherwise stated.

The maximum sustained working pressure to which the pipes and fittings will be subjected is based on water at a temperature of 20°C.

The Contractor shall submit full details of the colour of the pipe he intends to supply. The colour of the pipe shall be such as to meet the requirements of Clause 2 'Material' and Clause 8.5 'Opacity' of B.S. 3505.

The pipes up to and including 50mm diameter shall be of solvent weld type. The pipe shall be supplied with interchangeable sockets pre-formed at the factory and of such internal diameter that it takes the plain and of the pipe with same nominal diameter.

The joint shall sustain the end thrust to which the pipe shall be submitted. The Contractor shall supply sufficient quantity of the cleaner and adhesive which shall be required to make the joints with the pipes.

The pipes of 75mm diameter and over shall consider of a grooved socket at one end of the pipe. The socket shall be designed to give a clearance fit on the outside diameter of the parent pipe. The sealing medium that shall seat in the groove shall be a rubber ring.

If the formation of the socket and groove results in the thinning of the original wall thickness of the pipe, it shall be compensated for by shrinking on to the outside of the socket area as reinforcing sleeve of the same material as the pipe.

The socket and groove shall incorporate no sharp angles where the stress points are created.

The joint shall take 10% deformation of the spigot at the point where it enters the socket without leakage from the pipe when subjected to the test pressure specified for the pipe. Thermal expansion of the pipe shall be accommodated in the joint. The joint shall be capable of lineal deflection up to 30o

The sealing ring shall be of first grade natural rubber and the physical properties of the mix shall meet the requirements of B.S. 2494.

The Contractor shall supply sufficient quantity of any lubricant or other material that shall be needed to make the joint, which shall be assembled by hand.

The fittings shall have the same type of joint as for the pipes to be used. The Contractor shall submit full details of the materials, dimensions and test pressures of the fittings offered.

Precautions shall be taken to avoid damage of the pipes and fittings.

In handling and storing the pipes and fittings, every care shall be taken to avoid distortion, flattening, scoring or other damage. The pipes and fittings shall not be allowed to drop or strike objects. Pipe lifting and lowering shall be carried out by approved equipment only.

Special care shall be taken in transit, handling and storage to avoid any damage to the ends.

All jointing of pipes and fittings shall be carried out strictly in accordance with the manufacturer's instructions.

4.1.5.2 MANUFACTURER'S INSTRUCTIONS

The Contractor shall be responsible for obtaining copies of any manufacturer's instructions for pipe jointing and shall familiarize himself and his employees with these instructions.

All necessary tools and equipment required for the laying, jointing and testing of pipes and joints shall be provided by the contractor at no extra cost.

4.1.5.3 FITTINGS AND SPECIALS FOR GALVANIZED STEEL PIPES.

All specials shall be of such dimensions will mate with piping supplied. Screw down stop valves shall comply with B.S. 1010. Specials shall comply with B.S. 1740.

4.1.5.4 FLANGED ADAPTORS AND FLANGES

Flanged adaptors shall be piece suitable for connecting a flanged sluice valve to the type of piping supplied. All flanges or special shall conform to B.S. 10 part 1 and shall be drilled to Table `C` and machined across the faces. The flanged adaptors shall comply with B.S. 78 and B.S. 3961:1965. All P.V.C. flanges shall be supplied with metal backing rings, jointing of flanges shall be carried out using the joint rings, bolts and washers as necessary.

4.1.5.5 TEES

The spigot ends of all tees shall be suitable for connection to the pipe work supplied using the aforementioned flexible mechanical joints and branches shall be flanges drilled to B.S. 10 Table `C`.

4.1.5.6 HYDRANTS

The hydrants shall comprise a 75mm sluice valve and 75mm Duck feet bend with gunmetal screw connection to details shown on the detailed drawings. These specials shall comply with the requirements of B.S. 750: 1964.

4.1.5.7 GATE VALVES

All gate valves 80mm nominal bore 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. 3463. All gate valves required for fitting to the buried water mains shall be of cast iron construction in accordance with the requirements of B.S. 1218.

All gate valves up to 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.

4.1.5.8 AIR VALVES

Air valves shall be of cast iron conforming to B.S. 1452 Grade 14. They shall be suitable for working pressures not less than that specified for the class of pipe to which they are connected.

4.1.5.9 BALL FLOAT VALVES

Ball float valves shall be to B.S. 1212 Parts 1 and 2 shall be suitable for a working pressure not than the working pressure for the class of pipe specified for connection to the ball float valve.

4.1.5.10NON-RETURN VALVES

Non-return valves shall be of cast iron with flanges and shall conform to B.S. 4090:1966.

4.1.5.11STOP COCKS

Stopcocks up to 50mm diameter shall be brass and shall conform to B.S. 1010 Part 1: 1959 Part 2: 1973.

4.1.5.12RUBBER AND INSERTION JOINTING

Rubber and Insertion Jointing for flange joints shall comply with B.S. 2494 Part 1 and no jointing rings shall be used in the Contract, which have not been supplied by manufacturers approved by the Engineer.

4.1.5.13BITUMINOUS PAINTS

All bituminous or tar paints for protection of buried steel bolts, pipes, specials etc. shall be the best of their respective kinds manufactured by approved makers.

4.1.5.14STEEL PIPE AND FITTINGS FOR RISING MAIN

All piping shall be plain ended and suitable for used with flexible mechanical couplings (e.g. Viking Johnson, Dresser). The grade of steal used shall comply with the requirements of B.S. 3601: 1964. Pipes shall be welded or seamless and shall conform to B.S. 534: 1966 or an equivalent acceptable standard.

All pipes shall be externally and internally protected with bitumen in accordance with clauses 5.4 and 5.5 of B.S. 534:1966.

The external protection shall be reinforced with oven glass cloth glass tissue wrapping or by other approved material. All sheathed or wrapped pipes, fittings and specials shall be protected during transit by straw, wood wool or by other approved material.

The ends of all bitumen lined pipes, fittings and specials shall be closed by means of discs or other suitable covers firmly held in place.

4.1.5.15 DRAIN-OFF TAPS, STOP VALVES FOR WATER SERVICES

Fittings for mains of size 50mm or under shall comply with B.S. 1010. Samples must be submitted to the Consultant for approval prior to installation of fittings.

4.1.5.16 STORAGE OF PLANTS AND MATERIALS

The Contractor shall, at his own expense, make arrangements for dumps along the route of the pipe line for storage of pipes, his plant and materials, to suit his own convenience, but such arrangements shall be subject to the Engineer's approval.

4.1.5.17 LOADING, HANDLING AND CONVEYING OF PIPES

The Contractor shall before commencing to lay the pipes, valves or other materials examine them and ascertain that they are in perfectly sound condition and he shall be responsible for any pipes, valves and other materials, which may be found damaged after lying. The stocking of pipes and specials on site, loading and unloading etc. shall be carried out to the satisfaction of the Engineer.

4.1.5.18 INTERFERENCE WITH FENCES, DRAINS, PIPES, PROPERTY ETC

The Contractor shall ensure the proper reinstatement of fences, drains, telephone lines, K P & L. cables etc. where affected by his work. All services shall be adequately protected and propped to the satisfaction of the Engineer. The Contractor shall be liable for any damage caused to the services due to his failure to provide adequate protection.

4.1.5.19 METHOD OF EXCAVATION

a) The Contractor shall excavate the pipe trenches in the line and to the depths indicated by the Engineer. Except where otherwise indicated on the Drawings or directed by the Engineer, it is intended that the trench shall be excavated to such a depth as will allow of a minimum cover of 500mm over top of the barrel of the pipe when laid plus or minus a tolerance of 75mm either way. All trenches shall be excavated in open cuttings.

b) Where the trench passes through grassland, arable land or garden, whether enclosed or otherwise, the turf, if any, shall be pared off and stacked, and the productive soil shall be carefully removed for a width of 600mm greater than the nominated trench width or equal to the overall width of track of the excavating machine, whichever is greater, and laid aside to be subsequently used in reinstating the surface of the ground after the trench has been refilled.

c) The bottom of the trench shall be properly trimmed off, and all low places or irregularities shall be levelled up with fine material. Where rock or large stones are encountered, they shall be cut down to a depth of at least 75mm below the level at which the bottoms of the barrel of the pipes are to be laid, and covered to a like depth with materials, so as to form a fine and even bed for the pipe.

d) Joints holes shall be excavated to suit minimum dimensions as ill allow the joints to be well and properly jointed.

e) The pipe trench shall be kept clear of water at all times.

f) The Contractor shall, wherever necessary by means of timbering, or otherwise support the sides of the trench so as to make them thoroughly secure, and afford adequate support to adjoining roads, lands, buildings and property, during the whole time the trench remains open and shall remove such timbering or other work shall be deemed to be included in the rates for excavation. In case the Contractor is instructed by the Consultant to leave any portion of such timber in position, he will be paid for if accordingly.

g) The clear width inside the timbering in the case of single pipes shall be at least 320mm in excess of the external diameter of the pipe being laid, in order to allow it to be freely lowered into position, in the trench without damage to the external protection.

h) Where more than one pipe is to be laid parallel, then the clear width inside the timbering shall be at least 520mm in excess of the combined external diameters of the pipes.

i) Should the excavation be taken out to a greater depth than is specified the bottom shall be made good to the correct level with Mix 1:3:6 concrete or other materials approved by the Engineer. No payment shall be made for any other excavation carried out by the Contractor and the coat of filling up to required levels.

j) If a mechanical excavator is used by the Contractor, he shall indemnify the Employer against all claims for damage that in the opinion of the Consultant may be caused by the used of this plant. When a mechanical excavator is used the bottom 230mm of excavation shall be got out by hand to ensure an even bed for the pipes.

4.1.5.20MAIN LAYING

Mains shall be laid in straight lines and/or smooth curves as indicated on the Drawings. The vertical profile of the pipes shall be to even gradients. Any pipes not so laid shall be removed if so directed by the Engineer, and re-laid in proper manner at the Contractor's expense.

In laying the pipes and specials care shall be taken not to damage the protective linings and the pipes shall be handled with tackle as directed by the Engineer.

The pipes and specials shall be slung and sounded with hand hammer for flaws before they are lowered into the trench. After the pipes or specials have been checked they shall be cleaned internally and carefully lowered into trench and set to proper gradient and line so that there is a continuous rise from each washout to air valve.

4.1.5.21 TEMPORARY BENCH MARKS AND SIGHT RAILS.

The Contractor shall fix Sight Rails for use with boning rods at intervals of not more than 65 meters and temporary Bench Marks related to the Survey of Kenya. Datum shall be provided at intervals as directed by the Consultant.

4.1.5.22CURVES AND BENDS

Large diameter curves of main shall wherever possible be formed by giving a set not exceeding 3o to each joint, bends being used only where large diameter curves are not possible.

4.1.5.23CUTTING OF PIPES

The Contractor shall, subject to approval of the Engineer, cut pipes to such lengths as directed. Pipes should be cut off clean and square with the axis. Cuts should be made with an approved from the rotary cutting machine, but the Consultant may approve cutting by oxyacetylene cutters.

4.1.5.24FLANGED JOINTS

In laying pipes and specials with flanged joints, flanges shall be brought together and bolted with the faces absolutely parallel. A rubber jointing ring 3mm thick shall be used in each flange joint and one washer with each bolt. The ring shall be a strip ring lying within the bolt circle and a full flange width ring.

The bolts shall be tightened up gradually and equally in the customary manner in order to distribute the stress evenly over the flange. If it is found necessary to slightly from the normal run of the flange piping, the deflection shall be obtained by means of beveled gunmetal ring washer between the flanges.

4.1.5.25SURFACE BOXES

Sluice valves, air valves and fire hydrants shall be covered with Surface Boxes in accordance with details as shown on the Drawings. In roads and footpaths the boxes shall be laid flush with the surface.

4.1.5.26FIXING OF VALVES, AIR VALVES AND WASHOUT PIPES.

The Contractor shall fix the sluice valves, air valves, washout pipes complete with iron casing for spindles and surface boxes in accordance with and in position shown on the Drawings. As far as possible the cutting of pipes for this should be avoided.

4.1.5.27SUPPORT AND ANCHOR BLOCKS

Concrete mix 1:3:6 shall be placed around and against bends and other specials in trenches.

4.1.5.28COLOUR CODING

All underground pipes are to be wrapped with adhesive plastic tape at each meter in colours blue for drinking water and green for untreated water. All pipe work above ground and valves in valve chambers and pits are to be painted in similar colours.

4.1.5.29LETTERING

a) The lettering for sluice valves, fire hydrants, air valves and washout abbreviated SV, FH, Av and WO respectively shall be in accordance with the detail shown on the Drawings and colour coded as detailed hereafter:-

Untreated water:	White lettering on green background
Drinking water:	White on blue background
Fire Hydrant:	White lettering on yellow background

4.1.5.30TESTING

a) The test pressure shall be one and a half the maximum working pressure except where a pipe is manufactured from a material for which the relevant B.S. Specification designates a maximum

test pressure should not exceed 120, 180 and 240 metre/head for Clause B, C or D pipes, respectively.

The pump shall maintain the test pressure for about one hour and if there is any leakage, it shall be measured by the quantity of water pumped into the main that time.

b) When a section of the main has been jointed, the ends shall be closed with caps, plugs, or flanges, which must be strongly strutted against a solid surface to the satisfaction of the Engineer. The trench shall be properly backfilled and rammed as hereinafter specified and as shown on the Drawings, for its whole length so as to cover the main to a depth of not less than 500mm, except at the joint holes which shall be kept clear of all backfilling, if necessary by the use of timbering, so that each joint is left fully exposed for inspection. No backfilling will be permitted before testing of each section.

As long a section of main as possible shall be tested at one time subject to the maximum length of open trench approved by the Consultant or permitted by the Highway Authority, and the test shall be carried out within 12 working days of the completion of such sections of mains.

Where a main is laid across a road or in such a position as to interfere seriously with the normal use of the road, the Contractor may, with the consent of the Consultant and at his own risk, fill in such joint holes as may be necessary.

He shall, at his own expense, re-excavate any or all joint holes necessary to locate a leak and carry out repair work should the results of his hydraulic test prove unsatisfactory.

The section shall then be filled with mains water, great care being taken to drive out all air through air valves, ferrules or otherwise to the approval of the Consultant.

c) After the section to be tested has been charged and all air liberated it shall standing under moderate pressure for several days' final airing.

The leakage from the mains and connections from each section tested shall not exceed 4 litres of water per 25mm diameter of main, per 2 km. length each 24 hours, every 30 metres head of pressure, and any visible individual lea shall be repaired.

To determine the rate if leakage, the Contractor shall furnish a suitable hydraulic test pump, pressure gauge, connections and water meter or other appliance, for measuring the amount of water pumped.

If the leakage were at a greater rate than that specified, the Contractor should re-excavate the trench where necessary and shall remake the joints and replace defective work until the leakage shall be reduced to the allowable amount.

d) The Employer shall charge the Contractor the cost of any couplings required to join up tested lengths of main if, in the Engineer's opinion, greater lengths could reasonably have been tested or if failure under test requires the pipe to be cut, or other methods of laying should have been adopted.

The Contractor shall supply water used by the Contractor in testing the main. The Contractor shall carry out all work, which may be necessary for making temporary connections to the existing mains to obtain water for testing at his own expense.

e) In carrying out the test for water tightness the Consultant only shall authorise the operation of all valves, but the Contractor shall provide all the necessary labour to assist in the opening and

closing of the valves to the Engineer's instructions, and he shall allow in his prices for all his expenses in connection with testing on completion.
The Consultant shall be the sole judge of water tightness.

4.1.5.31 CLEANSING AND STERILIZING THE MAIN

When a pipeline is complete and where applicable, has successfully passed the test, it shall be thoroughly washed out using, if possible, an open end. Thereafter it shall be sterilized by being filled with a suitable solution containing not less than 20 p.p.m. of free available Chorine or such other sterilizing agent as the Consultant shall approve. After standing for 24 hours the main shall again be washed out and refilled with mains water prior to the taking of Bacteriological samples.

The Contractor shall provide all necessary stop-ends fittings and chemicals for this work.

Emptying and washing out of the pipes shall be done in such a manner as not damage the trench or cause undue flooding of the vicinity, and the Contractor shall supply and use such piping, specials and/or hose as may be necessary to facilitate the flow of water to the nearest drain or watercourse. Water used for washing out and sterilizing will be supplied by the Employer.

Before any section of the main is put into use a bacteriological sample or samples will be taken by the Engineer`s Representative and only on receipt of a satisfactory Certificate from the Medical Research Laboratory of the Employer will the main or section of main be permitted to be put into supply and be considered as having been substantially completed.

Any expenditure involved in providing facilities or materials for the taking of samples shall be included in the Contractor's tendered rates and the Consultant will specify and shall be the sole judge as to the number of samples required and the points at which they are to be taken.

The cost of the Bacteriological Examination will be borne by the Employer but if the sample and samples are not satisfactory the cost of any subsequent analyses will be borne by the Contractor.

4.1.5.32 CLEARANCE OF SITE

The Contractor shall remove all surplus pipes, specials and other fittings from the side as directed by the Engineer. The site of works shall be levelled and all surplus excavation, debris, cut trees or bushes shall be carted to the approved tip sites.

4.1.5.33 EXISTING INSTALLATIONS

a) **Cold Water**
Where pipes for cold water are to be connected up to existing installations, the condition of the existing installation is to be reported to the Consultant in order to establish if part of the existing installation is to be replaced.

b) **Sanitary Fittings**
Where existing sanitary fittings are to be removed or replaced, the fitting is to remove with outmost care and fittings and taps to be handed over to the client.

c) **Sealing off Existing Drains and Manholes**

Existing foul, surface water and subsoil drains exposed during progress of work are to be recorded and reported for investigation by the Architect. Where not required to be removed, seal off with concrete or grout solid as directed. Seal off connection to manholes, demolish walls to 500mm below surrounding ground level and fill remainder of manhole with consolidated approved rubber and cover to level of surrounding ground as directed.

2.1.6 COLD WATER STORAGE TANKS

Cold-water storage tanks shall include the ball valves and connectors for inlet, supply, washout, and overflow and may also include fire reel system supply pipe. The Sub-Contractor shall also include in his pricing the price of the overflow and amount pipes to a place to be indicated by the Engineer. He shall also include the washout valve.

Where paint is required tithe Sub-Contractor shall use the paint, which will not be toxic.

The tanks shall be manufactured to the following British Standards:-

a) Galvanised Mild Steel tanks to BS 417
b) Sectional Steel tanks to BS 1564

Where non-standard sizes shall be used, they shall be manufactured to the relevant standard but with the approval of the Engineer.

2.1.7 WATER HEATERS

4.1.7.1 ELECTRICALLY HEATED

Non-pressure and low-pressure type domestic electric water heaters shall comply with B.S. 843: 1964, high-pressure types shall be of a Standard not less than the appropriate B.S.

Domestic heaters shall, if nothing else is pacified, be supplied with 25mm thick fibreglass lagging and enclosed in the corrosion-proofed steel, finished in white stove enamel and be similar to manufactured `HEATRAE`.

Electric thermostatically controlled immersion heaters shall comply with B.S. 3456: Section A8:1963 and C.P. 324. 202: 1948.

Purpose made storage water heaters of the specified sizes shall comply with B.S. 853 and shall be to the specified working and test pressure. The heaters shall be provided with all necessary bosses, coils etc., and shall be hot dip galvanized after manufacture. Insulation shall, if nothing else is specified, be fibreglass to the specified thickness with finish suitable for painting.

Domestic heaters for floor mounting shall, if not provided with legs, be mounted on a minimum 100mm high concrete plinth.

Floor mounted purpose made heaters shall be provided with minimum 225mm high legs of sufficient strength welded to the heaters and to suitable floor plates before galvanising. Wall mounted heaters shall be supplied with all necessary brackets.

2.1.8 SOLAR WATER HEATERS

4.1.8.1 GENERAL

All materials, equipment and accessories are to be new and in accordance with the requirements of the current rules and regulations where such exist, or in their absence with the relevant British/European standard.

Uniformity of type and manufacture of equipment or accessories is to be preserved as far as practicable throughout the whole work.

If in this specification, the practice is adopted of specifying a particular item as "similar" to that of a particular firm's product, it is to be clearly understood that this is to indicate the type and quality of the equipment required. No attempt is being made to give preference to the equipment supplied by a firm whose name or products is being quoted.

Where particular manufacturers are specified herein, no alternatives makes will be considered, and the Engineer shall be allowed to reject any other makes.

The tenderer will be entirely responsible for all the materials, apparatus, equipment, etc in connection to his work, and shall take special care to protect all parts of finished work from damage until handed over to the Employer.

The work shall be carried out by competent workmen under skilled supervision. The Engineer shall have authority to have any of the work taken down or changed, which is executed in any unsatisfactory manner.

The works shall be carried out strictly in accordance with:-

a) British Standard B.S. 5918, Domestic hot water supply and solar water heating System
b) "British code of Practice" C.P. 310: Water Supply
c) British Standard code of Practice" C.P. 342: Centralized Hot water supply
d) All other relevant British standard Specifications and Codes of Practice (herein after referred to as B.S and C.P respectively.)
e) By-Laws of the Local Authority
f) The "Specification" and the "Particular Specification"
g) The tender/working drawings
h) The engineer's Instructions.

The drawings and specifications are to be read as a whole and are to explain each other. Work shown on the drawings and not described in the specifications or vice versa shall be duly executed under the contract.

4.1.8.2 SOLAR PANEL – CONSTRUCTION

Solar panels shall be flat plate solar collectors. The structure of the collector and its components must withstand local extreme environmental conditions including winds, storm etc.

4.1.8.2.1 SOLAR PANEL - INTERNAL CONSTRUCTION

a) Absorber - Shall be located directly beneath the glass sheet and fully cover the internal area

of the panel.

Absorber shall be made of copper sheet or aluminium with a selective surface chemically treated similar to the black chrome finish or similar. The selective surface shall achieve 95% absorptivity of solar radiation and 15 to 20% emissivity of infra-red radiation. The absorber and the selective surface shall not be affected during life span of the absorber.

b) Heat Exchanger - Copper tubes and fittings shall be utilized for internal panel pipe work and in accordance with B.S. 2871 or similar. All joints and connections between the riser and header tubings shall be leak proof and stand to hydraulic pressure tests.

The collector to be pressure tested to withstand a pressure of 8 kg/cm^2 whichever is greater. In general, collectors shall be pressure tested at 15 times the rated operating gauge pressure of 8kg/cm^2, whichever is greater.

A certificate of pressure testing to be issued when required and requested by the Engineers.

c) Insulation - The underside of the absorber, inclusive headers and the outer casing internal sides shall be insulated with 50 mm fiberglass insulation, minimum density 64 kg/m^3. The insulation shall be non-combustible and shall withstand maximum continuous operating temperature of 200°C (and minimum operating temperature of –50°C).

4.1.8.3 HOT WATER SOLAR CYLINDER

a) The hot water solar cylinder shall have a nominal capacity as specified on the contract drawing and particular specification to the designed highest water level. The hot water cylinder shall have a separate feed tank attached to it.

b) The cylinders and the feed tanks shall comply with B.S. 417, 699, 2777, 4214, 1565, 1566 and 3198. Refer also Water Storage tanks as specified elsewhere. The Cylinder and tanks shall be supplied complete with screwed BSPF parallel thread flanged connections for flow, return, vent, overflow and drain pipes.

c) Cylinder shall be provided with a magnesium electrode as corrosion protection, weight: minimum 1.5 kg and have an inspection cover to facilitate renewal of the electrode.

d) The cylinder shall be galvanized, after manufacture in accordance with the requirements of BS. 729 Part 1 and pressure tested in accordance with the above B.S.

A certificate of pressure testing to be issued when required and requested by the Engineers / Project Manager's Representative. Refer also to "Protection of Metal surface" as specified elsewhere in the specification.

e) **Insulation -** The cylinder shall be insulated on all the sides with 100 mm fiberglass, or 100 mm thick foam injected polyurethane. At the inspection cover, the insulation shall be easily removable.

f) **Cladding -** The insulation shall be with full 24 gauge galvanized M.S. Sheet cladding.

3 PART D

3.1 PARTICULAR SPECIFICATIONS FOR PLUMBING AND DRAINAGE INSTALLATIONS

3.1.1 INTRODUCTION

The specifications cover the execution of Plumbing and Drainage installations and should be read in conjunction with other relevant specifications, drawings and contract documents issued to the sub-contract.

3.1.2 INCLUDED IN THE SUB-CONTRACT

The works include, unless otherwise specified, supply delivery, installation, testing and commissioning, cleaning-up and setting to work all the installations described in the specifications and as shown on the contract drawings.

The provisions of all labour, materials, tools instruments testing apparatus and scaffolding necessary to execute the work in a first class manner, even such labour materials instruments or apparatus which are not specifically mentioned in the contract but are necessary for the satisfactory completion of the work, including such elements as:-

a) Cold water supply pipe work and fittings to the water storage tanks from the existing water mains.
b) Water storage tanks complete with all necessary covers, fittings, washout and overflow pipes and supports. The subcontractor is expected to take the overflow and washout pipes to a reasonable discharge point.
c) The water supply pipe work to the functional and sanitary as shown on the drawing plus the necessary fixing support and jointing materials from the water storage tanks.
d) The sanitary and operational fittings together with the fixing supports and jointing of the supply and discharge pipes.
e) The waste and soil pipe work from the sanitary and operational fittings to the first manhole including all fixing, supports and jointing materials.
f) All cutting away and all making good will if nothing else is specified, be carried out by the main contractor but it will be the responsibility of the sub-contractor to ensure that this work is kept to a minimum, be responsible for the correct marking out of all chasers and holes; and will provide also necessary details to the main contractor.
g) The sub-contractor shall also be responsible for ensuring that runs for floor or wall chases, holes to be cut or left will be marked out at the appropriate stage of structural work.
h) The sub-contractor shall undertake all notifications demanded by the Authorities in order to comply with current regulations and produce all certificates, if any, the authorities without extra charge.
i) The sub-contractor shall as part of his tender supply all necessary information such as manufacture, catalogue or type numbers, brochures or copies of catalogue pages, weight and all other relevant information which are necessary to classify the equipment tendered for.

j) All other material labour, tools instruments, scaffolding, etc, which are necessary for completion in a first class manner of the plants to the Engineer's satisfaction. Excluded
k) are only materials and workmanship especially mentioned herein as excluded from this Sub-contractor"
l) The sub-contractor shall include for cables, pipes etc from central facilities to working area.
m) Provide the Engineer for his approval complete working and manufacturing drawing as specified.
n) Commissioning and testing of the plants as specified.
o) Supply of complete operation and maintenance manuals as specified as well as adequate instruction of the client's maintenance personnel as specified.
p) The sub-contractor shall include for full maintenance during initial maintenance period as specified.

3.1.3 EXCLUDED FROM THE SUB-CONTRACT

a) All concrete works, inclusive of necessary holes, plinths etc.
b) All block work inclusive of necessary holes (to be marked by the Sub-contractor) etc.
c) All electrical wiring up to and inclusive of isolators and switchboards.
d) The main contractor will provide central located facilities for supply of water and power during the construction period.

3.1.4 EXTENT OF THE SUB-CONTRACTOR'S DUTIES

At the commencement of the work, the sub-contractor shall investigate and report to the Engineer if all materials and equipment to be used in the work, and not specified as supplied by others, are available locally. If not available, the subcontractor shall at this stage place orders for the materials in question and copy the orders to Consultant. Failure to do so shall in no way relieve the sub-contractor from supplying the specified materials and equipment in time.

Any item or material found to be defective shall be replaced by the sub-contractor within seven days of his being notified and any result of defective workmanship shall be repaired including supply of new parts if necessary, immediately upon being notified.

The sub-contractor shall furnish at his own cost any samples of material or workmanship required for the sub-contract works, that may be called for by the Engineer for his approval and the Engineer may reject materials or workmanship not in his opinion up to the approved standard. The sub-contractor shall allow in his prices such samples.

The sub-contractor shall when authorized in writing by the Consultant, make variations from the specifications and drawing. No profit will be allowed on omitted items or works.

The sub-contractor shall submit to the Architect or to the Engineer claims for any work for which he considers demanding extra payments before the beginning of such work.

The sub-contractor shall be responsible for verifying all dimensions relative to his work by actual measurements taken in the site.

The sub-contractor shall request any alteration to the building structures within 30days of the awarding of the sub-contractor. Only such alteration as deemed unavoidable by the Engineer will be considered.

The sub-contractor shall collaborate with the Engineer and the main contractor in planning the installation before work is commenced. Particular care shall be taken to ensure that there is close collaboration with the other sub-contractors when installing services.

The Engineer shall have full rights to inspect the work in progress and all materials equipment for use in the installation prior to its erection whether these are on site or the sub-contractor's workshop.

The sub-contractor shall allow for all reasonable access to the works for this purpose.

Where large items of equipment are to be installed, the sub-contractor shall advise the main contractor in good time so that access is provided for installation before work is commenced on site.

The sub-contractor or his responsible representative shall be in all site meetings as and when required in order to discuss the works, make necessary decisions, receiving relevant instructions and to confirm fulfilment of time schedules.

3.1.5 FINISH PAINTING

When all the installations have been set to work, tested and commissioned, the sub-contractor shall prime the pipe work with an undercoat and paint 2 No. coats of paints in accordance to BS 1710 Colour coding and to the satisfaction of the Consultant.

4 PART E

4.1 PARTICULAR SPECIFICATIONS FOR FIRE FIGHTING SYSTEMS INSTALLATIONS

4.1.1 HOSE REEL SYSTEM

6.1.1.1 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: Lower Floors.

The Sub-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 Sub-Contractor because of his non-compliance with the above requirements.

If in the opinion of the Sub-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.

6.1.1.2 COMMENCEMENT OF WORKS

The sub-contractor in submitting his tender shall be deemed to have included for commencing any necessary work on site at such a time as will comply with the main contractor's programme, or shall be directed by the Engineer.

6.1.1.3 ORDERING

The sub-contractor shall order materials from the quantities taken from his own approved working drawings and not the quantities shown in the specifications.

6.1.1.4 SPARES

Spares shall be presented to the client at hand over.

6.1.1.5 SCOPE OF WORKS

The Sub-Contractor shall supply, deliver, erect, test and commission all the automatic fire fighting hose reel installation which is called for in this specification and shown on the Contract Drawings.

In connection with the above works the Sub-Contractor shall liaise fully with the plumbing Sub-Contractor who will be responsible for making a new connection to the existing water mains, supplying and laying a metered service pipe, up to the connections to the water tank.

The Sub-Contract shall handover to the Electrical Sub-Contractor all the electrical control gear for the installation. The Electrical Sub-Contractor shall supply electrical power, interconnecting cabling and wiring to the hose reel installation.

The Sub-Contractor shall supply and handover all the wiring and control diagrams necessary for the Works when required to do so.

Though the Electrical Sub-Contractor shall install the isolator and be responsible for the electrical connections in compliance with electrical regulations, the Sub-Contractor for the Works contained in this document shall supply and install the starting and stopping gears, indication equipment and retain full responsibility for the correct functioning of the installation.

6.1.1.6 FIRE HOSE REEL PUMPS

The fire hose reels pumps shall consist of a duplicate set of multi-line centrifugal pumps as Lowara Sphere Unit Model CEM 80/5 or similar approved. The pumps shall be capable of delivering 2.3 l/s (8.3 m^3/hr) against a head of 25 m (2.5 bars). The complete specification of the packaged pump set to be as follows: -

a) Pumps
High Efficiency single impeller pump, enclosed type motor, enclosed in a stainless steel shell.

b) Pump Materials
Suction and Discharge Casing made from Grey Cast Iron. Pump body, back plate, shaft, conveyor, diffuser and impeller made from Stainless Steel AISI 304.

c) Motors
T.E.F.C. Squirrel Cage Motors conforming to metric standards suitable for 240 volts (± 6%), single phase, 50 Hz supply. Windings insulated to Class "F", Speed 2800 RPM, permanent split capacitor, built-in thermal overload and IP 44 protection.

d) Mechanical Seal
Self-adjusting type with carbon/ceramic with elastomer made of NBR and other components in stainless steel.

e) Base Frame
Welded fabrication from Mild Steel sections with facility for lifting unit.

f) Flexible Connections
Flexible connections affixed to suction and discharge connections of the pump.

g) Valves
Pump Isolating Valves shall be Butterfly Valves to B.S. 5155 with Cast Iron nylon coated disc and black nitrile liner. Non-Return Valves shall be vertical lift type to be manufactured from Cast Iron with nitrile seal.

h) Control Panel
The control panel is to be located in the position indicated on the contract drawings.
The control panel shall be constructed of mild steel with auto lacquer finish, be moisture, insect and rodent proof and shall be provided complete with spare fuses and a wiring diagram enclosed in plastic laminate.
Standard panel cubicle manufactured to IP55 Standards, containing Direct-On Line Starters or Star Delta Starters above 4.0 kW.
Safety features to include 240 volts low voltage controls except for starter coils. Panel shall be mounted on vibration isolators to minimise vibration to electrical equipment.

The panel shall incorporate HRC main fuses and thermal overloads for the pump motors, time control unit for minimum run period, start relay incorporating timing element for standby pump delay, and one set of voltage free changeover contacts to give remote alarm/indication for the indicator lights mentioned.

The pump shall be controlled by a pressure switch and the control panel shall include the following facilities to IP 54 protection:-

i. "On" push button for setting control panel to live
ii. Green indicator light for indicating control panel live
iii. Duty/stand by pump auto-change over
iv. Duty pump, pump run green indicator light
v. Stand by pump, pump run green indicator light
vi. Duty pump fail red indicator light
vii. Stand by pump fail red indicator light
viii. Hand/Off/Auto Switches
ix. Line and control circuit fuses
x. Low water condition pump cut out with red indicator light

i) Pressure Switch

It shall be of Differential adjustment type switch manufactured to IP44 Standards.

Multi-pump sequencing control effected from a single pressure instrument, utilising control circuitry especially for pressure boosting applications.

j) Pressure Gauge

4" Dial Bottom Connection to B.S 1780 calibrated in Bars and kPa.

k) Membrane Tank - (24 litre Hydrosphere)

Fabricated Steel Construction housing a neutral rubber diaphragm ideally suited for drinking water applications. Pre-charged with Nitrogen to correct pressure at test stage.

l) Low Level Water Cut-out

The pumps shall be protected by a low level cut out switch to prevent dry pump run when low level water conditions occur.

6.1.1.7 PIPE WORK

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

6.1.1.8 PIPE FITTING

The pipefittings shall be galvanised wrought steel pipefittings welded or seamless fittings conforming to B.S.1740 Part 1971 or malleable iron fittings to B.S.143/1256.

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

6.1.1.9 FLANGES

The flanges shall comply with B.S.4504:1969. All flanges shall comply to a nominal pressure rating of 16 bar (P.N.16)

6.1.1.10GASKETS

The gaskets for use with flanges to B.S. 4304:1969 shall comply with B.S. 4865 Part 1: 1072 for pressure up to and not exceeding 64 Bar.

6.1.1.11NON-RETURN VALVES

The non-return valves up to and including 80 mm diameter shall be as Pegler to B.S.5153: 1974 with flanges to B.S. 4504 P.N.16.

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

6.1.1.12GATE VALVES

The gate valves up to and including 80 mm shall be as Pegler non-rising stem and wedge disc to B.S.1952.: 1964 (B.S. 5154:1974) with screwed threads to B.S. 21 taper thread.

6.1.1.13SLEEVES

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

6.1.1.14HOSE REELS

The hose reels to the installation shall consist of recessed automatic hose reels as Mather & Platt Model 1065 standard swinging hose reel (recessed).

All the above hose reels shall comply with B.S.: 1976 and B.S, 3169: 1970 and is to be installed to the requirements of C.P. 5306 Part 1 1976.

The hose reels shall be supplied and installed complete with first-aid non-kicking hose 30 metres long, with nylon spray jet/Shut-off nozzle. A screw down chrome plate globe valve to B.S. 1010 to the inlet of the reel shall be fitted. The orifice to the nozzle is to be not less than 4.8 mm to maintain a minimum flow of 0.4 l/S to the jet.

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

6.1.1.15EARTHING

The hose reel installation shall be electrically earthed by a direct earth connection.

The installation of the earthing carried out by the Electrical Sub-Contractor.

6.1.1.16FINISH PAINTING

Upon completion of testing and commissioning of the hose reel installation the pipe work shall be primed and finish painted with 2 No. coats of red paint to the Architects requirements.

6.1.1.17TESTING AND COMMISSIONING

The hose reel installation is to 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 a half times the working pressure of the installation to the approval of the Engineer.

Simulated fault condition of the pumping equipment, is to be carried out before acceptance of the system by the Engineer and Architect.

4.1.2 PORTABLE FIRE EXTINGUISHERS

6.1.2.1 WATER/CARBON DIOXIDE EXTINGUISHERS

The portable water filled carbon dioxide cartridge operated fire extinguishers shall have 9 litres nominal capacity and shall comply with BS 5423.

The extinguishers shall be supplied complete with wall mounting brackets 370mm long neoprene hose and pressure relieve valve treated at 30 bars.

6.1.2.2 CARBON DIOXIDE EXTINGUISHERS

The portable carbon dioxide extinguisher shall have 5 kilogram nominal capacity, supplied complete with wall mounting brackets hose and horn and shall comply with BS 5423.

6.1.2.3 FIRE BLANKETS

The fire blankets shall measure 1.22 x 1.22 metres made from texture woven glass fibre and shall be completely fire resistant.

The blanket shall be housed in sturdy non-corrosive dispenser and shall be fitted with special tapes to offer instant, single action release.

6.1.2.4 FIRE HYDRANTS

The fire hydrant shall be screw down to BS 750 (*type 2*) with screwed outlet and similar or equal to Glenfield make.

4.1.3 SPRINKLER INSTALLATION

6.1.3.1 GENERAL

This section includes the supply and installation of sprinkler system in Basement complete with control valves, gauges, pumps and pipe-work.

For Preambles and Specifications applicable to this section the Contractor is hereby referred to "RULES of the FIRE OFFICES" COMMITTEE for AUTOMATIC SPRINKLER INSTALLATIONS" 29TH Edition issued (revised) November 1973 and particularly to section dealing with ORDINARY HAZARD Group II.

6.1.3.2 SYSTEM COMPONENTS

6.1.3.2.1 SPRINKLERS

Sprinkler heads shall be of approved makes and types. They shall not be allowed in any respect nor have any types of ornamental or coating applied after leaving the production factory. Sprinkler heads of conventional or spray patterns are acceptable for use with orifice of 15mm diameter.

6.1.3.2.2 PIPE-WORK

6.1.32.2.1 PIPE SPECIFICATION

Sprinkler pipe-work to be "class B" black steel tubes conforming to BS 1387, steel tubes and tubulars for screwing to BS 21 pipe threads.

6.1.3.2.2.2 WELDED PIPES

Only pipes of 50mm in diameter or greater may be joined together by welding unless the joints are fabricated, welded and inspected in the workshops of installing sub-contractors whose welding procedures shall have been approved by the Fire Insurers.

6.1.3.2.2.3 CONCEALMENT OF PIPE-WORK

Sprinkler pipe-work shall not be embedded in the concrete floors of the building, nor should it be concealed in any other situation where difficulty or undue expense would be involved in making alterations or additions which may subsequently become necessary.

Where it is considered necessary to fit orifice plates in order to assist in hydraulically balancing a system or to meet pump characteristic curves, the diameter of the orifice must not be less than 50 per cent of the diameter of the pipe into which the plate is to be filled. Such orifice plates are only allowed in pipes 50mm diameter or larger. They shall be of brass with plate central holes without burrs and thickness stated in the table below. They shall be situated not less than two pipe diameters from any elbow or hand measured in the direction of flow. Orifice plates shall have a projecting identification tag which is readily visible on which is stamped the nominal pipe diameter and the "K" factor for the orifice.

6.1.3.2.3 TEMPERATURE RATINGS

Sprinkler heads shall be of nominal temperature rating of 79^0C.

The following colour code shall be adopted to distinguish sprinkler of different nominal temperature ratings:

Glass bulb types (^{0}C)	Colour of bulbs
57	Orange
68	Red
79	Yellow
141	Blue
182	Mauve
204 / 260	Black

6.1.3.2.4 STOCK OF REPLACING SPRINKLERS

a) A stock of spare sprinklers shall be maintained on the premises so that any sprinklers that have operated or have been damaged in any way may be promptly replaced. These sprinklers shall be kept in cabinets located in prominent and easily accessible positions where ambient temperature conditions will not exceed 38^0C.

b) The number of spare sprinklers to be maintained on the premises will largely depend on the size of the protected premises and the Hazard class of the system

c) As s general guide the 34 sprinklers minimum number of spares shall be maintained of standard temperature ratings.

d) Sprinkler spanners as stipulated by the manufacturers of the sprinklers shall be kept in the cabinets for use in removing and installing sprinklers.

Nominal size of pipe (mm)	Orifice plate Thickness (mm)
50	
63	3
70	
100	6
150	
200	9

6.1.3.2.5 SLOPE OF PIPES FOR DRAINAGE

Sprinkler pipes shall be so installed that the system can be thereon duly drained. As far as practicable all pipes shall be arranged to drain to the installation drain valve which shall be not less than 50mm diameter.

6.1.3.2.6 PRESSURE GAUGE

On this installation there shall be a pressure gauge (gauge "c") fitted immediately above the alarm valve and another (gauge "g") immediately below the alarm and main stop valves.

Pressure gauges shall conform to B.S.1750. The maximum scale valve of such gauges shall be of the order of 150 per cent of the known maximum pressure. Pressure gauges must have scales with divisions not exceeding 0.2b for a maximum scale valve of 10b, not exceeding 0.5b for a maximum scale on excess of 16b.

Means must be provided to enable each pressure gauge to be readily removed without interruption of installation.

6.1.3.2.7 VALVES

6.1.3.2.7.1 INSTALLATION CONTROL VALVES

The installation must be provided with a set of installation control valves comprising:-

i) A main stop valve
ii) An alarm valve (wet pipes)
Or
iii) A composite alarm valve suitable for a wet system
iv) A water motor alarm and gong.

a) Stop valves

i) General

All stop valves except these fixed by the Water Authorities on the branches from a town main shall be "right handed" i.e. they must be so constructed that in order to shut the valve the spindle shall turn clockwise. The controlling wheels of all stop valves shall be

clearly marked showing in which directions the wheel is to be turned to close the valve; there shall be an indicator also which will show whether the valve is open or shut.

ii) Main Stop valves

The installation shall be provided with a main stop valve, which when closed will shut off all supply of water to the installation. All water supplies shall be connected before passing through the main stop valve.

The main stop valves shall be placed to an entrance to the premises preferably a main entrance, in such a location at to be always readily visible and accessible to authorized persons. It must be secured open by a padlocked or riveted strap.

A plan of the risk with the position of the main stop valve or valves, clearly indicated thereon shall be placed within the building where it can be readily seen by firemen or others responding to the alarm. In addition, a location plate shall be fixed on the outside of an external wall, as near to the main stop valve as possible, bearing the following words in raised letters or other approved type of letters.

iii) Sprinkler Stop Valve Inside

The words "SPRINKLER STOP VALVE" should be in letters of at least 35mm, and the word "INSIDE" of at least 35mm in height. The words shall be painted white on black ground.

iv) Stop Valves Controlling Water Supplies

All stop valves controlling water supplies shall be secured open by a padlocked chain or a padlocked or riveted strap.

b) Alarm Valves

i) Alarm (Wet Pipe) Valves

Alarm (wet pipe) valves (often referred to as "Ordinary' Alarm Valves) shall be of an approved type. They shall be fixed on the main supply pipe immediately by above the main stop valve and before any connection is taken off to supply any part of the installation.

c) Alarm Devices

i) Water Motor Alarms

Every installation shall be fitted with an approved water motor alarm and it must be located as near the alarm valve as practicable and in any case the total length of pipe-work should not exceed 25m. The water motor must not be located higher than 6m above the valve.

The pipe-work should be galvanized and of 15mm nominal diameter where the length does not exceed 6m otherwise it must be of 33mm nominal diameter throughout. The pipe-work shall be arranged to drain through a non-ferrous fitting having an orifice not larger than 3mm diameter.

Water motor alarms must be tested at least once a week. For this purpose, there shall be a 15mm test valve on the installation side of the alarm valve.

ii) Electric Alarm Pressure Switches

Electric alarm pressure switches are permitted on this system as an auxiliary warning device. They are not accepted as a substitute for the standard water motor alarm device.

1. The apparatus, including the alarm switch and control unit, must be approved by the Fire Officers' Committee and the installation must be carried out by manufacturers of approved automatic fire alarm systems or sprinklers systems or other sub-contractors specially approved by such manufacturers for the purpose.
2. There shall be a maintenance contract which will ensure that the installing sub-contractors will make half-yearly inspections of the system and at all times maintain it on an efficient working order. Following each inspection the installing sub-contractors shall certify that that system is in satisfactory working order.
3. Alarm signal may be initiated either
   a. By a flow of water in the sprinkler system using an electric alarm pressure switch connected to the alarm valve in a similar manner to the sprinklers alarm motor using water flow alarm switches in the system pipe-work above the alarm valve. Or
   b. By fall of pressure in the pipe-work system above the alarm valve.
4. Adequate means shall be provided to avoid false alarms such as may occur with water supplies subject to fluctuations in pressure.
5. The system wiring and power supply must conform to the requirements laid down in British Standard Code of Practice for Electrical Fire Alarms.

6.1.3.2.8 GAUGES

Brass-cased pressure gauges not less than 100mm diameter shall be connected to the suction and the discharge sides of each pump. The gauges shall be graduated in kN/m^2 and meters of water; the range of the scales shall not exceed 1½ times the maximum head; the static head at rest shall be marked by an adjustable red pointer, the two gauges shall read exactly alike under these conditions. Where duplicate pumps are installed one pair of gauges shall be so a connected with isolating cocks that the head of each pump can be read.

6.1.3.2.9 DRIVES

Pumps shall be driven by electric motors and may be direct-driven or belt driven as indicated. Drives shall be properly aligned; flexible couplings are required for direct drives. For belt drives provision shall be made for the adjustment of belt tension. Floor mounted pump sets shall be positioned on an anti-vibration base and be properly levelled before the holding down bolts are grouted in.

6.1.3.2.10 AUTOMATIC SPRINKLER PUMP-SET

6.1.3.2.10.1 GENERAL

The automatic sprinkler shall consist of an automatic mounted centrifugal electrically driven pump and an automatic horizontally mounted diesel driven fire pump.

One pump shall be connected to the normal incoming Electrical grid main and if applicable to the standby Generator and the other to be coupled to a diesel engine.

6.1.3.2.10.2 PUMPS

The Pump sets shall be similar to those detailed in the bills of Quantities including all the interconnecting pipe-work in galvanized, valves, pressure switches, flow controller and panel. Pumps shall be complete with a drain plug and except where the pump is inherently self-venting an air cock.

The pumps shall be capable of providing at installation control valve a running pressure of at least 1.4 bars plus the pressure equivalent of the difference in height between the highest sprinkler and the valves at a nominal rate of 1750dm^3/min.

The pumps shall be constructed of cast iron with impeller of cast iron/ brass alloy and are to have mechanical seals.

The motor shall be three phase, totally enclosed fan, cooled squirrel cage continuously rated complying in general with BS 2613/1970.

Provisions 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 name plate shall carry a reference to the fact that the performance given is that of pump and orifice plate combination, and reference shall be made to the orifice K factor.

6.1.3.2.10.3 THE DIESEL ENGINE

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.

a) Rating

The rating shall be continuous as defined in BS 649.

b) Speed and Governing

The normal speed of the engine shall be 1500 revolutions per minute.

Speed governing shall be B.S. 649 class A and over speed protection shall be provided.

c) Time of Run – Up Speed

From the initial operation of the starting switch, the engine shall start, run up to normal speed and be capable of accepting full load within a minimum of 10- 15 seconds.

d) Cooling

Engine cooling shall be by water jacket, with water circulating pump and heavy duty radiator with electrically or mechanically 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 air flow 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 to the water in the engine jacket when starting from cold and to control its

temperature when the engine is running. Where necessary to limit the oil temperature rise, water cooled lubricating oil stabilizer complying with B.S. 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.

e) Engine Starting

Engine starting shall be by a battery powered electric starter motor complete with automatic starting and sequencing control equipment and starter cutout switch. The engine starting control equipment shall be arranged to disconnect the mains operated battery charger to prevent its 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 a gear-ring on the engine fly wheel before the starter is fully energized. The pinion shall positively disengage when the engine starts or when the motor is de – energized.

f) Fail to Start Protection

The starting equipment shall incorporate a suitable automatic process timer, so arranged that, if the engine fails to start within reasonable time (e.g. 8 seconds), the starter motor shall be disconnected. The starting attempt shall be repeated after an interval of 2 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.

g) 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:

i) Engine Over speed
ii) High cooling water temperature
iii) Low lubricating oil pressure
iv) 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.

h) Oil Dipstick

A lubricating oil level dipstick suitably graduated shall be provided and located in an 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.

i) Starting Handle

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.

j) Starting 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 recharging 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 – hour's 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 the electrolyte.

The tender price shall be based on the provision 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.

k) 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.

l) Engine Instruments

The following dial type engine instruments shall be provided:

i) Engine shaft speed indicating tachometer reading revolutions per minute.
ii) Service hours counter
iii) Lubricating oil pressure gauge
iv) Lubricating oil thermometer
v) Cooling water thermometer

The instruments may be mounted on a suitable panel fixed to the engine or may be incorporate in the main control panel.

The exhaust system shall be manufactured in heavy quality steel tubing to BS 1387, fitted with suitable robust flexible gastight 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 practical level without appreciably impairing the working efficiency of the engine.

The silencers and exhaust pipe-work 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 pipe-work shall drain away from the exhaust manifold and drain cocks shall be fitted in the lower parts of the system to enable condensate to be readily 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 exhaust system shall terminate at a safe point outside of the building to be approved by the engineer.

m) Air Intake 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.

n) Drain Plugs and Cocks

Drain plugs and cocks, as appropriate 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.

o) Fuel and Lubricating Oil Filters.

Suitable and efficient oil filters of an approved type and construction having replaceable 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 pump manifold.

p) Wiring on Engine Unit

The Electrical wiring on the engine unit shall be carried out with M.E.C.C. Cable having a conductor minimum cross -section of 1.5mm^2 for single core cables and for multi-core cables. All wiring shall be adequately supported and protected from accidental damage and properly installed and terminated in suitable boxes with flexible connections, all in accordance with the manufacturer's 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 far as practical.

q) 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 to BS 799, part 1. The tank, complete with all necessary pipe-work, 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 adjacent 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)
v.) Drain valve and drain hose connection.

r) Fuel Tank Filling Pump.

A cast iron wall mounted hand operated semi- rotary 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 the rate of at least twenty times the maximum consumption of the engine when at full output.

The pump shall be clearly labeled to indicate the type of oil to be used and shall be provided and fitted with suitable connecting pipe-work, including a length of oil – resisting protective cap or cover with retaining chain shall be provided when the pump is not in use. A removable type filter shall be incorporated in the oil supply line.

s) Coupling to Pump

The engine shall be coupled to the pump in an approved manner in a mono-block arrangement or by a suitable shaft coupling and satisfactorily guarded to comply with BS 1649.

The Sub – contractor shall state the method of coupling proposed.

4.1.4 WORKING DRAWINGS

The sub-contractor shall submit two sets of working drawings for engineer's approval within four weeks after his appointment for the sub-contract works; and additional four sets of approved drawings for issue to contractors for works related to this sub-contract.

The working drawings shall be prepared in metric scales not smaller 1:50 and in such detail that not only the sub-contract works can be executed on site but also the sub-contractor's proposals and intentions of the installations are clearly defined and detailed.

The working drawings shall include, but shall not be restricted to the following:

a) Fully dimensioned drawings clearly showing the exact locations and physical measures of all items of equipment, pipe work and pipe fittings, electrical connections and fixing details.
b) Equipment make, model numbers, rating and net operating weights
c) Sizes and location of plinth, holes in building fabric and any other related builder's works.
d) Comprehensive details of electrical; requirements and wiring diagrams.

Upon practical completion of the sub-contract works and before handing over of the sub-contract works, the sub-contractor shall provide two sets of "as installed" drawings for the sub-contract.

The record drawings shall detail the installations "as installed" on site and shall include all information called for in working drawings.

Before handing over of the sub-contract works, the sub-contractor shall also provide two sets of water resistant, laminated operating instructions and two sets of comprehensive maintenance and troubleshooting manuals, in English, for the complete sub-contract works.

4.1.5 OPERATING AND MAINTENANCE INSTRUCTION

After completion of the testing and commissioning of the sub-contract works, the sub- contractor shall demonstrate to and instruct the client's representative/s in the proper usage, maintenance and trouble shooting of all aspects of the sub-contract works.

4.1.6 HANDING OVER

The sub-contracts works shall be considered complete and defects liability period shall commence only after:

a) The sub-contractor works and associated support services have been satisfactorily completed, tested, commissioned and operated for a period of seven days after commissioning.
b) The sub-contractor has submitted the record drawings and maintenance manuals called for in clause 2.20, test certificates and manufacturers' warranty certificates.
c) The sub-contractor has demonstrated the operation, servicing maintenance and trouble shooting of all aspects of the sub-contractor works to be relevant representative/s of the employer.

4.1.7 FIRE AUTHORITY APPROVAL

The sub-contractor shall be responsible to arrange for inspection and certification of the fire-fighting installations by the local fire authority.

4.1.8 INSTRUCTION PERIOD

The Sub-Contractor shall allow in his contract sum for instructing of the use of the equipment to the Clients 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 required shall be stipulated by the Client but will not exceed two days in which time, the clients staff shall be instructed in the operation and maintenance of the equipment.

SECTION G

ELECTRICAL INSTALLATION SPECIFICATIONS

PART I

GENERAL SPECIFICATION

3 PART I - GENERAL SPECIFICATION

3.1 Extent of Electrical Installations

The Tenderer shall include in his tender, prices for the design of new installations, manufacture, inspection, testing, packing, shipment, insurance, shipping, customs duties, taxes, delivery to site, unloading and all other charges. The Tenderer shall also include for complete erection, tests on completion, setting to work, finishing and painting and maintenance of all items of plant and equipment described or implied within these Technical Specifications and shown on the relevant drawings to the satisfaction of the Engineer and the Architect.

The electrical services within the buildings shall be complete in all respects as specified herein, and shall include all items of equipment, materials, accessories, fittings, supports, etc. necessary whether such items are specifically referred to in the Contract or not. The Tenderer shall be deemed to have included in his tender price all items necessary such that the installations are complete in all respects and left in good working order.

If awarded the Contract, the Contractor shall be expected to provide fully detailed drawings of the entire installation together with layouts of all civil and building works etc. required to accommodate/house the plant and equipment, these layout drawings and details being related to the existing layouts as may be necessary. The drawings shall be submitted for approval within three weeks of the award of the Contract such that the Architect and the Engineer can be made aware of all requirements. It shall be deemed to be the responsibility of the Contractor to ensure all civil and builder's works required for this Contract are prepared and/or provided to suit the programme of this Contract. No claims will be entertained.

All proposed new layouts and structures shall be subject to the full approval of the Engineer and the Employer.

3.2 Programme for Electrical Engineering Installations

The Tenderer shall provide within a stipulated period of acceptance of his tender and award of Contract, a complete programme for the electrical engineering installations to be executed indicating the anticipated commencement and completion dates of the following activities:

(i) Submission of working drawings for approval
(ii) Placing of orders with other specialists for plant and equipment to be incorporated in the works
(iii) Receipt by the Contractor from other specialists of plant to be incorporated in the works.
(iv) Manufacture by the Contractor of plant to be incorporated in the works

(v) Inspection and testing by the Engineer
(vi) Shipment of the plant from country of manufacture
(vii) Delivery of the plant and equipment to site
(viii) Erection on site, details for all activities
(ix) Telephone Data installations
(x) Kenya Power Company installations
(xi) Tests on Completion.

Operations shall be commenced when instructed and shall be carried forward to completion with the greatest possible expediency, to the satisfaction of the Architect and the Engineer, in accordance with the Programme. The Contractor's programmes shall be agreed with the Engineer and shall adhere fully to the requirements and timing of the agreed Main Contractor's programme.

3.3 Drawings accompanying the Tender Documents

The Electrical Drawings indicate generally the arrangement of the installations and are for assistance in tendering only. The position of equipment and apparatus shown thereon are approximate only, the exact positions, together with the actual runs of ductwork, trunking and conduit etc., will be agreed upon with the Engineer and the Employer prior to commencement of work. It shall be deemed that the prices entered by the Contractor include for the repositioning, of the various services, to meet the above requirements. No claims will be entertained.

The Contractor shall satisfy himself as to the correctness of all Drawings and measurements particularly the dimensions of the electrical installations. If the Contractor finds any discrepancy in the Drawings or between the Drawings and the Technical Specifications or between the electrical installations and the Drawings, he shall immediately refer the same to the Engineer who will make a ruling on the discrepancy. Figured dimensions shall be taken in preference to the scale mentioned on or attached to any Drawings. Details shown on Drawings shall be read in conjunction with items included in the Technical Specifications.

The Engineer will furnish the Contractor within a reasonable time after the receipt by the Engineer of a written request for the same, any details of which, in the opinion of the Engineer are necessary for the execution of any part of the works. Such a request to be made only within a reasonable time prior to the execution of such work in order to fulfil the Contract. One copy of the Drawings, details and Technical Specifications shall be kept on the site until the completion of the Contract and the Engineer shall at all reasonable times have access to the same. The Contractor shall return all copies of Drawings and other relevant details to the Engineer on the completion of the Contract.

Additional Drawings will be issued by the Contractor to the Engineer to suit the design requirements of the works. These Drawings being issued either during or after the tender period as may be required or necessary. These Drawings will supplement the details contained within the Technical Specifications and Bills of Quantities and the Tenderer shall be deemed to have taken these into account in his pricing. Where the Contractor can demonstrate that the Drawings relate to new approved or additional items these new or additional items shall be priced to approval in accordance with the Contract rates and prices.

3.4 Contract Working Drawings

The Contractor shall prepare fully detailed Working Drawings for all items of plant, equipment and accessories required for installation under this section of the Contract. Two copies of each Drawing shall be forwarded to the Engineer for approval and or comments. One copy will be returned stamped "approved" or "not-approved". Where Drawings require further information and/or modifications to meet the comments made by the Engineer they shall be re-submitted, again in duplicate, for approval.

When Drawings have been approved two further copies shall be forwarded to the Engineer, together with copies to the Architect, Site and the Employer.

Drawings, and, where relevant, calculations in respect of the following shall be prepared by the Contractor and submitted to the Engineer for his approval commencing within ten (10) days from acceptance of the tender.

(a) Cabling and external cable routes
(b) Details of all conduit and trunking runs in respect of different services
(c) Details of lighting and power circuits, routes etc
(d) Details of sub-main switchgear and distribution boards
(e) Fire alarm layouts and all circuit diagrams
(f) Lightning and surge protection details
(g) Technical literature for all the services
(h) Layouts of all ducts, chases, holes, trenches and all other services throughout the whole of the building and associated external works

All drawings shall be to scale and fully detailed with all the important dimensions shown and the construction of key components indicated.

During progress of the building works, the Contractor shall make all necessary checks on site to ascertain that the various services can be installed as specified and shown on the approved Drawings.

Where such works cannot be so installed, this must be immediately brought to the notice of the Engineer and Architect prior to the progress of such works.

The Engineer, in conjunction with the Architect and the Employer, will check and return the Drawings submitted for approval within a reasonable period, but in any case not exceeding fourteen (*14*) days from receipt of the Drawings.

The layouts of plant and equipment are for general guidance only. The Contractor shall assess the requirements and prepare a plant layout for approval within twenty one (*21*) days, the required liaison being maintained with other specialists, such that an agreed layout is submitted for approval.

3.5 Record Drawings

As soon as the works are complete and all tests satisfactorily carried out, the Contractor shall hand to the Engineer two sets of Record Drawings, together with one set of negatives of the same, showing the works as finally installed. These Drawings shall be prepared on approved transparent plastic material in black ink or as approved by the Engineer. The certificate of

making good defects, will not be issued until this condition has been complied with. Record Drawings are in addition to detailed Working Drawings and shall show all cable routes, circuits, trunking, conduits, plant, trenches, ductwork and ducts etc., together with the entire plumbing, drainage and firefighting installation, as finally installed.

The Engineer will provide the Contractor with a set of Contract Drawings (in addition to the two sets provided for the Contractor's site and office use), which shall be maintained by the Contractor's representative on site and which shall be used for recording of Contract variations as they occur. This set of Drawings shall be available for the Engineer's inspection on site, and shall be kept up to date.

The cost of the preparation and submission of the above Contract and Record Drawings shall be deemed to be included within the Contractor's prices.

3.6 Maintenance Manuals

At the start of the defects liability period, the Contractor shall hand over to the Engineer, four sets of maintenance and operations manuals for each plant and equipment installed. These manuals shall be in English and shall be fully illustrated.

3.7 Builder's Work and Civil Works

Builder's Work and Civil Works that are incidental to this section of the Contract such as cutting of holes in walls and floors, provisions of foundations for the plant and machinery, shall be the responsibility of the Main Contractor. The Contractor shall be fully responsible for the preparation of all such details that relate to such works, the details being subject to approval by the Architect and Engineer prior to submission to the Main Contractor for action. Other items such as fixing of brackets, cables and ductwork and trenching, making good etc. shall be carried out by the Contractor to suit the installation of all the services.

It is the Contractor's sole responsibility to ensure that all holes and chases are in the required position and that any additional ducts, holes and chases necessary for erection of the installations in situ concrete walls, floor slabs etc., are included in the early stages of construction as appropriate.

The Contractor shall furnish the Engineer, Architect and Main Contractor with all the necessary information including position of foundations, brackets and fixings and shall ensure that such works are performed in accordance with available information.

The Contractor shall include in his tender all supports, fixings, plugging of holes in walls, ceilings and floors to facilitate the fixing of the pipework, accessories, and all other portions of the plumbing, drainage and firefighting installations. Any purpose-made fixing brackets shall also be provided and installed by the Contractor, including escutcheon plates and the like.

The Contractor shall supply and install approved pipework support brackets and hangers. It shall be deemed that prices include for any special requirements and that the Contractor has visited the site during the tender period to ascertain all details.

The Contractor shall pay particular attention to the fixing and alignment of items. All items shall be installed square, true and perpendicular to floors i.e. as shown on Drawings and as

may be required at site to the Engineers approval.

3.8 Commissioning of the Electrical Installation

The Contractor shall instruct the Employer's Maintenance Engineer or his representative on the operation and maintenance of the various components forming the electrical installation and shall provide drawings, diagrams and manuals to ensure the Maintenance Engineer or his representative is completely conversant with such installations.

The Contractor shall ensure that the services installations are left in complete safe working order and operating to the satisfaction of the Engineer.

3.9 Regulations and Standards

The Installations must be carried out strictly in accordance with the following documents: -

Electrical Services

(i) The current edition of the IET Wiring Regulations , BS 7671
(ii) Relevant International Standards
(iii) Current Regulations and by-laws of KP
(iv) Regulations and by-laws of the Ministry of Energy
(v) Nairobi City Council By-Laws
(vi) Current Regulations of Communication Authority
(vii) By-laws of the Energy Regulatory Board (ERB)
(viii) Any other duly constituted Authorities regulations having jurisdiction over the Works.
(ix) Water Supply and Sewerage Authority's Regulations.
(x) The Specification and accompanying documentation and Drawings.
(xi) The Working Drawings produced by the Contractor and approved by the Engineer.

The Contractor shall undertake all modifications demanded by the authorities in order to comply with the regulations, and produce all certificates, if any, for the authorities at no extra charge.

3.10 Quality of Materials

All materials, fittings and accessories are to be new and in accordance with the requirements of the current rules and regulations where such exist, and with the relevant international standards.

Uniformity of type and manufacture of fittings and accessories is to be as far as practicable preserved throughout the whole Works.

Wherever the term 'similar to' is used in these Technical Specifications in reference to any item, the word will be understood to mean type and quality of the equipment and not preference.
Where particular manufacturers only are specified herein no alternatives will be considered without good reasons.

All materials shall be of good quality, suitable for the purpose specified, and to the approval of the Engineer.

3.11 Workmanship

The Tenderer shall take into consideration, when pricing his tender, that there will be other specialists working alongside him. Any disruptions to the existing services must therefore be kept to a minimum, and in this respect the Contractor shall include in his prices for carrying out Works outside normal working hours as may be directed by the Engineer. No claim will be entertained where abnormal working hours are required to meet this requirement and completion of the works within the specified Contract period.

The Contractor shall be fully responsible for co-ordination of installation of all services. For all services involving ducted wiring, such wiring shall be capable of future addition or maintenance.

The Contractor shall be deemed to have included in his tender prices for relocating switches, terminal points, ductwork, outlets and fixtures in positions and/or locations at least one metre in any direction from the positions indicated on the Drawings. Within these limits no variations in the Contract sum will be made unless the work has already been executed in accordance with previously approved Working Drawings.

Only qualified and certified persons shall be allowed to carry out installation work. The Works shall be performed in a neat and workmanlike manner.

The Contractor shall take every precaution to avoid damage to the existing property including roads, paved walkways, grassed areas, landscaping, cables, drains and other services, and he will be held responsible for and shall make good all such damage at his own expense to the satisfaction of the Engineer.

The Contractor will be responsible for the exact runs and placing of pipe work, conduit, boxes, ductwork and accessories that are to be cast in concrete, ceilings, floors, walls, columns and beams, and for the proper fixing of the pipe work and accessories to the shuttering and the steel reinforcement work.

Where ductwork is to be concealed, the pipes etc. shall be in an exact position relative to the finished plaster or such other finishes as may be applied to enable adequate cover to be applied.

Where services are run above the false ceilings the Contractor shall ensure that access to all services is readily available such that future maintenance can be carried out without difficulty. Full details shall be included on the Working Drawings such that the Engineer can give consideration to the Contractor's proposals.

3.12 Setting out of work

The Contractor will be responsible for laying out his work and shall obtain all the necessary information as may be required to carry out the work. Such information shall be obtained sufficiently in advance to avoid any possibility of delay to the Works as a whole.

The Contractor shall be fully responsible, and shall seek, the de ails of all work being carried out by the various trades on Site, particularly where such trades may interfere with each other, or where co-ordination is necessary. No claims for extra costs will be entertained arising from omissions, oversight, or neglect in this regard.

In advance of the delivery of the plant and equipment, the Contractor shall arrange for the supply of all-necessary foundation bolts, templates, nuts, plates, sleeves, anchorages, etc., as required and as may be directed by the Engineer.

3.13 Erection and checking of work

The Contractor shall provide, and be solely responsible for, all skilled and unskilled labour, tools, lifting tackle and other equipment required for handling of plant and equipment when transporting to Site, within the Site and during erection.

All erection works shall be subject to approval by the Engineer.

All parts shall pass such tests as required by the Engineer to prove compliance with the Contract irrespective of any tests which may already have been carried out at the Manufacturer's Works. In particular all electrical pressure tests made at the Manufacturer's Works shall be repeated at voltages approved by the Engineer.

The Contractor shall supply and install all supports, fixings, brackets and similar items as may be necessary for the completion of the installation of the services as specified and as shown on the Drawings.

3.14 Site performance and acceptance tests

The Contractor shall give notice of the date of the specified tests to be performed on completion of installation. The notice shall be made in writing to the Engineer at least five days to the date of the specified tests. Unless otherwise agreed the tests shall take place within seven days of the stated date or on such day or days as the Engineer shall in writing notify the Contractor in writing. The tests shall be carried out under normal working conditions to the satisfaction of the Engineer and shall extend over such continuous periods as he may direct.

All skilled labour, supervision, apparatus, fuel and instruments required for carrying out the tests will be the responsibility and at the expense of the Contractor. The accuracy of the instruments shall be demonstrated if required. The Contractor shall ensure that test instruments are in good working condition and have been calibrated by an authorised agent.

If any part of the plant or equipment fails to pass the specified tests, further tests of the said part shall, if required by the Engineer, be repeated. The Contractor shall, without delay, put in hand such modifications as found necessary so as to meet the requirements of the Contract and any expense which the Client may have incurred by reason of such further tests shall be deducted from the Contractor’s Contract price.

Each completed system within the installation shall be tested as a whole under operating conditions to ensure that each component functions correctly in conjunction with the rest of the system.

3.15 Test records

The Contractor shall make the necessary records of all the tests carried out, and when the tests have been successfully completed he shall provide the Engineer with test records and reports in a format to be agreed.

3.16 Dust, insect and vermin proofing

All equipment, likely to be affected by ingress of dust, shall be effectively dust proofed and vermin proofed where no protection is afforded in its normal manufactured form. All materials used shall be in general resistant to attack by insects, micro-organisms or other fauna or flora. Materials used for such protection shall be to the approval of the Architect and Engineer.

3.17 Painting and finishing

All mechanical and electrical plant and equipment installed under this Contract shall be painted or otherwise finished to approval in accordance with appropriate international code for standard colours to be furnished by the Contractor prior to the shipment or manufacture of the plant or equipment including all pipe work, ductwork, etc. Such finish shall be entirely compatible with the conditions of heat, humidity, exposure to the weather, and other relevant factors arising from the materials, location and condition of operation of the equipment.

Paintwork will be measured in the builder's work in connection with the Engineering Element. Any additional work will be measured in accordance with the conditions of the Contract.

The Engineer may request samples of paint finishes, the cost of which shall be deemed to have been included within the tendered prices for all works.

All final painting of equipment, fixtures, and accessories shall be carried out by the Contractor, except where it is the usual practice of the manufacturer of items of plant and equipment to apply a high standard of protective finishing paintwork in the shop before despatch. This will be acceptable provided the Contractor at his own costs makes good any damage to paintwork, occurring in shipment, transportation and installation.

The interiors of electrical switchboards control panels, and similar items, shall be finished in an approved enamel colour and shall comply with the appropriate international standards for enamel finish which shall be furnished by the Contractor prior to shipment or manufacture of the plant or equipment. The exteriors of such panels and enclosures shall be of international standards specification colour as specified by the Engineer.

3.18 Labels

All items of electrical plant, Sub-main distribution boards, etc. shall be neatly and clearly labelled externally with identification marks corresponding with those on Drawings or in Technical Specifications. Final details shall be agreed upon by the Contractor and the Engineer.

Identification labels shall be of laminated plastic material engraved, black on white, with no less than 6mm "Lino" style letters and shall be fixed on or adjacent to all items by means of at least two brass screws or to the approval of the Engineer. Self-adhesive labels shall not be permitted.

All main switches, circuit breakers, isolators, valves, motors, switch-fuse, consumer service units, and distribution boards etc. shall be neatly and clearly labelled externally with identification marks corresponding with those on the Drawings or Technical Specifications. Final details shall be agreed upon by the Contractor and the Engineer.

All labels/plates shall be in English.

3.19 Specialist manufacturers

Where specialists are not nominated by the Employer, the Contractor shall appoint specialist manufacturers and suitable specialists for any sections of the Works described herein in which he is not himself an experienced, recognized and approved specialist.

The Tenderer shall, on submission of his tender, indicate the names of all proposed specialist manufacturers and specialists, together with the precise sections of the Works for which each will be responsible. The Contractor may be required to seek alternative manufacturers or Contractors or to accept specialists nominated by the Employer; it shall be deemed that the prices entered in the tender include for this requirement. For plant and equipment supplied by suppliers other than the Contractor, the Contractor will be required to furnish an agreement between himself and the supplier stating that he is authorised by the supplier to deal in the plant and equipment and that he is authorised to stock the necessary spare parts or that the Employer will be authorised to revert to the supplier in the event of breakdown of the plant or equipment.

The Contractor shall allow in his prices for phasing his work to meet the requirements of the other specialists, and for varying his programme or otherwise, to comply with the erection programme of such specialist. No additional costs will be allowed to the Contractor for any disruptions to his programme, or otherwise, in his compliance with the above requirements.

3.20 Interference with the existing Works

The Contractor shall not interfere in any way with any existing works whether the property of the Employer or of a third party and whether the position of such works is indicated to the Contractor by the Engineer or not. The exception being where such interference is specifically described as part of the Works either in the Contract or in any instruction from the Engineer.

3.21 Protection of Works

The Contractor shall carefully protect from injury by weather all Work and materials which may be affected thereby and allow in his prices for all dams, pumping, shoring, temporary drains, sumps etc. necessary for the purpose. The Contractor shall clear away and make good at his own cost to the satisfaction of the Engineer all damage caused thereby.

3.22 Sundries

The necessary holding down bolts, supporting brackets and templates, guards and screens, locks, piping, conduits, lamps and other requisite sundries whether specified in detail or not shall be provided, under the Contract and it shall be deemed that the Contractor's prices, rates and the like include for all such items.

3.23 Schedules of technical data

Where included in the Tender Documents, all Tenderers shall complete Schedules of technical data; otherwise the Tender may not receive full consideration, and will be liable to rejection.

3.24 Copies of orders

Copies of all orders for major items of plant, equipment and materials places with suppliers shall be provided in triplicate to the Engineer.

3.25 Inspection and tests at Manufacturer's Works

The Engineer, and his duly authorised representative, shall have at all reasonable times access to the Contractor's premises to inspect and examine the materials and workmanship of the mechanical and electrical plant and equipment during its manufacture there. If part of the plant and equipment is being manufactured on other premises, the Contractor shall obtain for the Engineer and for his duly authorised representative permission to inspect as if the plant and equipment was manufactured on the Contractor's own premises. Such inspection, examination or testing, if made, shall not relieve the Contractor from any obligation under the Contract.

Where the plant and equipment is a composite unit of several individual pieces manufactured in different places, it shall be assembled and tested as one complete working unit, at the Maker's works, to the relevant International Standards where applicable.

PART 2 - PARTICULAR SPECIFICATIONS
ELECTRICAL INSTALLATIONS

4 PART 2 - PARTICULAR SPECIFICATION

4.1 Extent of installation

The Contractor shall carry out all the necessary works for successful installation of the electrical services as described and set out in this section of the Technical Specification, Bills of Quantities and accompanying Drawings in accordance with the General Electrical Specification herewith.

The Works, the major elements of which are scheduled below, includes the supply of all labour, material, equipment, plant and components necessary for complete installation and setting out work in respect of the entire electrical services requirements within the proposed development and rendering it in complete working condition in respect of but not limited to the following installations:

- Incoming electricity supply
- Low Voltage Switchboards;
- Electrical distribution;
- Lighting and power installations;
- Earthing
- Lightning and transient over-voltage protection; etc
- Provisions for ICT and Security Installations

In general the installations shall be concealed in conduits except in areas where surface installation is Necessary. In such cases, installation will be carried out in trunking, conduit or cable tray as indicated on the Drawings.

4.2 Incoming Electricity Supply

The incoming power supply to the Proposed Project will be from a new 315KVA transformer terminated to Client's LV Switchgear to

The Contractor shall be responsible for liaison with KP personnel in respect of organising to carry out final connections of the supply cable (*if necessary*) to the Three phase KP Bulk Client meter indicated above.

4.3 Meter Board for the Expo Hall

New meter board, as specified, shall be supplied, installed, tested and commissioned complete with the specified MCCBs (*moulded case circuit breakers*), metering and items Necessary for the complete installation and setting to work.

The meter boards shall be of the residential cu icle type, constructed and installed as described below.

The meter boards, suitable for wall mounting, comprising of a sheet steel cubicle with front access, with space for KPLC Cut-Out, KPLC Three phase energy bulk meter and MCCBs (*where specified*) etc. The meter board shall be heavy duty, cast metal, enclosed type, with Perspex viewing glass.

The meter board shall be rigidly constructed and shall be of not less than 1.4 mm gauge.

The doors shall be of similar rigid construction free from twists and warps. The hinges shall be brass, and attached by brass screws. The meter board shall be lockable and a Viro or Yale padlock shall also be provided.

The Contractor should ensure that entry of cables, ducts, and conduits shall be neatly made.

All bolts, nuts, screws, hinges, handles, etc. shall be corrosion resistant.

The meter boards must be approved by the engineer before installation.

4.3.1 Moulded Case Circuit Breakers

(a) General

Moulded Case Circuit Breakers (*MCCBs*) shall as a minimum requirement comply with IEC-60947-2-ED. 5.0 CORRIGENDUM 1 and BS EN 60947-2:2017 or any other approved equivalent Standard.

The breaking capacities of the circuit breakers shall be at least equal to the prospective fault level at the point of the distribution system where the breakers are installed.

All MCCBs shall be designed for horizontal or upright mounting without any adverse effect on electrical performance.

The MCCB shall be provided with a cover manufactured by the MCCB manufacturer.

(b) Construction

Operating mechanism shall be of the quick make quick break type, with the speed of operation independent of the operator, and mechanically trip free from the operating handle so as to prevent the contacts from being held closed against short-circuit and overload conditions. The operating mechanisms shall be constructed to operate all poles in a multi-pole breaker simultaneously during opening, closing and tripped conditions.

The breakers shall be operated by a toggle, which shall clearly indicate the three fundamental positions ON, OFF and TRIPPED. If required, rotary handles shall be supplied.

The breaking and extinction of the electrical arc shall be achieved by means of non-welding contacts and an arc chute surrounding these contacts.

The current limiting MCCBs with very high capacity shall be made of two parts: -

- A standard circuit breaker for small and medium fault current

- A current limiter block to break and limit large short-circuit current.

The current limiter blocks shall be of fuse free type and the one opening mechanism type and factory fitted to the standard breakers.

All accessories and electrical auxiliaries such as shunt trip or under-voltage release auxiliary contact or motor mechanism shall be manufactured in such a way that they can be easily adapted on the installation premises.

(c) Operation

Each pole of the MCCB is provided with bimetallic thermal element for inverse time delay protection and magnetic element short-circuit protection. The thermal releases shall be of the adjustable type and could be equipped with sealing facility. Above 250 Amps the trip unit could be of the solid state energised by internally mounted current transformer.

It shall not require any external power supply to operate the tripping mechanism. All MCCB's shall be provided with interchangeable trip unit.

Current discrimination tables showing overload and short-circuit discrimination shall be provided for each rating.

4.3.2 Earthing

The Contractor shall provide Earthing of the meter board in accordance with the KP / IET Regulations all as per section 4.23 of these specifications.

4.4 Electrical Distribution System

4.4.0 Scope of Work

The Contractor shall supply and install test and commission new distribution cables as indicated on the drawings to complete the electrical distribution system, all in accordance with the IET Wiring Regulations BS 7671.

4.4.1 Sub-main Cables

The Contractor shall supply new PVC insulated or armoured cables with stranded copper conductors as shown on the drawings. All low and medium voltage cables shall be rated at 600/1000 Volts and shall comply with the relevant British Standard or other approved international standards. The Contractor shall supply, install, test, and commission the entire sub-main cable system.

All the sub-main cables to consumer units for lighting and power shall be drawn in conduit/ducts concealed in walls, floors and ceilings slabs of the buildings.

4.4.2 Distribution Boards

The Contractor shall supply new distribution boards of the surface/flush mounted metal enclosure type complete with MCBs. The Contractor shall ensure that each distribution board is complete with hinged lid and is so constructed that the circuit breaker toggles are concealed when the lid is closed. The distribution boards shall be controlled by an isolating switch integral with the board.

The Contractor shall ensure that all circuit breakers are provided with thermal overload and magnetic short-circuit tripping and a quick trip-free mechanism. The Contractor shall ensure that the Necessary discrimination between each main panel and final sub-circuit is provided. The Contractor shall ensure that circuit breaker and distribution boards used throughout the installation are of the same pattern, range and manufacture and all MCBs have short circuit capacity not less than 3 kA.

The final fixing and mounting height of each board and other associated switchgear shall be agreed on site to suit the plant, benches, trunking, services, cupboards etc. The rating of all distribution boards' breakers shall not be less than 100 Amp.

Where surface boards are installed sub-circuit conduits shall be suitably terminated within adaptable conduit boxes, flush mounted behind the surface mounted distribution board. The Contractor shall ensure that this is correctly done.

4.4.3 Consumer Units

The Contractor shall supply new as appropriate the consumer units of the flush mounted metal enclosure type complete with MCBs and isolating switches, similar to those described under Clause
4.4.2.

4.4.4 Contactors

The Contractor shall ensure that contactors where required are suitable for continuous heavy duty and fitted with 240 voltage coils. They shall be of robust construction to BS EN 62271-

106:2011 or approved equivalent standard where applicable, and rated at not less than the current carrying capacity of the outgoing circuits.

4.4.5 Armoured Cables

The Contractor shall ensure that underground cables (*PVC/XPLE/PVC*) are made of stranded copper conductors. The cables shall be rated at 600/1000 volts grade to BS 6724:2016 or approved equivalent international standard. The cables shall be terminated in brass compression type glands of the correct size to secure the cable inner sheath and ensure effective electrical continuity between the cable armouring wires and the metal enclosure on which the cable is terminated. A copper earth link shall be provided at the cable termination point for earthing of the cable armour and cable gland to the sub-boards earthing point.

4.4.6 Electrical Distribution System

The Contractor shall be fully responsible for the Necessary liaison and co-ordination of all works on site.

The final cable routes and layouts are to suit pipe work, drainage, cables foundations and the like. The Contractor shall produce Drawings for approval indicating the alternative proposed routes of cables. These shall in general follow an agreed service reserve decided by the Engineer, in conjunction with the Employer.

4.5 Lighting Installation

4.5.1 Scope of the Work

The Contractor shall supply, install connect, test and commission the lighting fittings as shown on site and set out in the Schedule.

4.5.2 General

All lighting fittings shown on the drawings or set out in the various schedules are to be supplied and installed complete under this quotation.

The lighting installation shall be generally concealed throughout, the conduits being run above the false ceilings, cast within the concrete slabs or chased into the walls. The various positions for all lighting fittings are as indicated on the drawings. These however, are subject to minor changes and adjustment to suit the false ceiling details and the locations of services and facilities. All supports, fixings and the like to be supplied under this contract, the Contractor being responsible for the final ceiling arrangement. Where false ceilings are provided, all openings, services access, trims, suspensions and connections to suit the fittings supplied, are to the approval of the Engineer and the Employer.

4.5.3 Method of Wiring to Fittings

The circuit wiring shall be continuous throughout on a loop-in loop-out system and there shall be no joints other than at the lighting fitting positions/boxes. The final connections to lighting fittings shall be from a conduit box complete with domed lid and cord grip. The circuit wiring terminating within the box at a suitably rated terminal block and wiring (via the cord grip) to the fitting carried out in heat resisting 3-core PVC/PVC cable.

The lighting fittings shall be wired, in general, with 2.5mm^2 single core PVC cables, the final connections to all fittings being carried out in heat resisting cable. The Contractor shall inspect to ensure that this is correctly done on site.

4.5.4 Fluorescent Fittings

Fluorescent fittings are the type as indicated on the schedules and specified herein. They are complete with tubes, wiring auxiliaries and all other items as specified or required for the complete installation and setting to work.

Each tube is provided with a low loss ballast and starting devices. Each fitting is power factor corrected to 0.90 and fused. The Contractor shall inspect and ensure that the spacing between ballasts is not less than 50mm and between condenser and other auxiliaries 75mm.

The Contractor shall ensure that internal connections are made with heat resistant wiring of ample rating, and all the wiring is bunched and neatly secured in a manner to ensure minimum heating from auxiliary components. A three ways connection unit should be properly secured and shall provide for all circuit connections.

Colour temperature of tubes shall match throughout, except where otherwise specified. In general they shall be warm white.

The Contractor shall inspect and ensure that all fluorescent fittings are approved by the Kenya Bureau of Standards (KEBS) and comply with local safety standards and if required, the Contractor shall be ready to submit a written evidence of such approval.

It shall be the responsibility of the Contractor to determine all details relating to the fixing of the fittings and auxiliaries with particular attention being paid to the false ceiling areas etc. The locations of all fittings are subject to the Engineers approval, final positioning shall therefore be agreed upon in the course of the Contract.

The recessed fittings, within any false ceilings shall be finally installed subject to the Engineers approval. The Contractor shall ensure that all fittings, trims and supports details are provided and agreed prior to the installation. The Contractor shall liaise with the Engineer to complete the works.

4.5.5 Incandescent Fittings

Incandescent fittings shall be of the types shown in the schedules. Enclosing metal-ware shall be of robust construction, complete with mounting holes, openings for cable or conduit entry, earthing terminal, and space for cable connections shall be as required. Where wiring is carried out within a stem or suspension tube, it should be of ample size to facilitate easy insertion of wires. No mountings shall be so arranged that complete rotation is possible, i.e. that wiring can be twisted. Suspension chains shall be utilised so that the wiring shall not be allowed to take the weight of the fittings.

Lamp-holders in totally enclosed fittings shall be of heat resistant type made of porcelain or brass, and connected with heat resistant cable. Generally, lamp-holders and lamps shall comply with BS EN/IEC61-1.

4.5.6 LED Light Fittings

LED fittings have been specified in the Bill of Quantities. Specifications for LED fittings must be strictly adhered to.

For LED fixtures, lamps, drivers, and components, provide a complete warranty for parts and labour for a minimum of three years from the date of Substantial Completion. LED fittings shall comply with DD IEC/PAS 62717:2011.

4.5.7 Emergency Lighting

Emergency lighting shall consist of normal LED lighting fixtures with emergency battery backup.

Battery-backed LED emergency lighting fixtures shall consist of a normal LED fixture with some or all of the LEDs connected to a battery and charger.

The battery shall be nickel cadmium and sized for a minimum of 90 minutes of fixture operation. The charger shall be solid-state and provide overload, short circuit, brownout and low battery voltage protection.

The battery and charger shall include self-diagnostic and self-exercising circuitry to exercise and test itself for 5 minutes every month and for 30 minutes every 6 months. The fixture shall include a test/monitor module with LED status indicating lights mounted so as to be visible to the public. The fixture shall not contain an audible alarm.

4.5.8 Lighting Switches

The Contractor shall inspect and ensure that light switches are rated at 20 amperes as a minimum. All switches shall generally be flush mounted and fitted with the approved flush conduit boxes. Surface switches of the metal clad type and approved range and pattern, are provided within plant rooms, service ducts and similar areas.

Circuit switches shall be one-way or two-way where more than one switch is denoted at any position; multiple gang units shall be used.

The light switches shall be assembled in single or multiple units, in boxes of galvanised steel and fixed with brass screws. Screw heads used to secure switch cover plates to be finished to match the cover plates.

The switches shall be of the same manufacture and type throughout the installation. The Contractor shall submit to the Engineer, for approval, a sample of the switches and cover plates he proposes to use. Switch plates and plug socket plates shall match in colour throughout.

The mounting heights are 1.375 m but are finally subject to adjustment to suit building details. The Contractor shall check all door swings to ensure that the switches are on the lock side. These will be entirely the responsibility of the Contractor.

4.6 Power Installation

4.6.1 Scope of the Work

The Contractor shall supply, install, test and commission the power installation as shown on the Drawings.

4.6.2 13 Ampere Switched Socket Outlets

The socket outlets shall be positioned and of the type as indicated on the site or on drawings. Every 13 Amp socket outlet shall be complete with a fused plug top.

Unless otherwise stated, 13 Amp socket outlets and spur boxes shall be wired to ring main circuits.

The socket outlets shall be assembled in single or multiple units as required. Except where mounted and fixed to trunking the sockets shall be mounted/fixed to boxes of galvanised steel and fixed with brass screws. The Contractor shall submit to the Engineer, a sample of each outlet and cover plate proposed for use in the works. This applies equally to all the power and switch plates specified throughout this document. The socket outlets shall match those of the lighting switch plates.

In the Kitchen room the socket outlets are mounted on walls at high level. The final mounting height will be to suit the levels of the equipment and shall be agreed on site. In general, all areas shall include outlets mounted at 350mm above the finished floor level. A uniform level, for all sockets and power outlets, shall be agreed to suit the requirements of the Engineer and the Employer. Locations shall be subject to change to suit the layouts within the various areas. The Contractor shall take this into consideration when pricing his tender. Where outlets are to be installed in pairs they are to be installed under the one cover plate.

Except where installed using surface wiring, all outlets shall be surface or flush mounted and fitted into approved surface conduit boxes, earthing terminals, etc. as previously described.

The circuit wiring is rated/sized to IET Regulations and shall not be less than 2.5mm^2 PVC. The wiring shall be inside conduits and/or trunkings to suit the requirements of the particular area, a concealed installation being provided throughout.

The phasing and circuit wiring for all socket outlets, power outlets and lighting circuits shall be agreed. Details shown on the Drawings are, at this stage, for information only. The Contractor shall finally provide details for approval to suit the final layout throughout the site as required by the Employer.

All socket and power outlets shall be fully earthed and bonded-up complete, especially where located and mounted close to sinks, taps, etc. All sinks, taps and water pipework and appliances shall also be fully bonded up as required by the relevant IET Wiring Regulations BS 7671 to ensure equi-potential between all items.

4.6.3 13 A pere Switched Fused Connection Units

13 ampere switched fused connec1tion units are to be supplied installed for termination on the various circuits as indicated on the Drawings. The connection units are of the range specified on the drawings and every socket outlet shall be complete with plug top.

4.6.4 Isolators

Isolators of the indicated ampere ratings shall be supplied and installed for connection to the various items as indicated on the drawing.

4.6.5 Connections to Instantaneous Showers

Instantaneous showers are controlled from 32 Amp. DP switches with neon indicator, flush mounted in the position indicated on the drawings. Wiring from consumer unit to 32 Amp DP switch shall be 3x6mm^2 PVC single core copper cables. Connections to the instantaneous showers shall be done by means of flexible 3-core 6mm^2 PVC insulated cable.

4.6.6 Motor Control Cubicle

The motor control cubicle shall be supplied and erected as required for the installation. It shall be complete with switchgear, starters with all types of protections, facility for remote control, instruments, relays, lights for start/trip and items Necessary for the complete installation and setting to work.

The control cubicle is of the industrial enclosed cubicle type. The Contractor shall submit the details to the Engineer for discussion and approval prior to the manufacture.

4.6.7 Telephone Outlets

Flush telephone outlets shall be provided where shown on the drawings and complete with white finish plate with PVC sleeve cord with internal diameter of 5mm complete with steel clamp to retain sleeve cord on underside.

4.7 System of Wiring

Unless otherwise specified or indicated on the Drawings, all wires and cables for power and lighting enclosed in conduit and trunking shall be of single core type, PVC insulated 600-volt grade, copper to BS EN 60601 & BS 7671 61386-24:2010 The installation is or shall be carried out on the looping-in system with continuous mains throughout each circuit. All connections to fittings and the like are or shall be of a solid nature and small connectors (*other than porcelain enclosed heavy brass sleeves*) shall not be allowed. Porcelain connectors enclosing heavy brass sleeves shall be provided for heat resisting tails for enclosed fittings and for the drops for pendant type fittings.

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All connections to flexible cords or cables shall be such that any strain on the cord or cables is not transmitted to the connection.

Draw wires shall be left in all conduits provided under this contract where these conduits are for future services.

Joints in PVC cables shall not be allowed in any part of the system.

The number of cables run in conduits shall be in accordance with the IEE wiring regulations BS 7671. With the exception of 3-phase power points or sub-main supply circuits to 3-phase boards, the circuits grouped in any one conduit shall be connected to one phase of the system only. This does not apply to wiring run in trunking. All switch wires for lighting circuits shall be on the phase or "live" side.

An insulated earth wire shall be provided in all conduit and trunking systems, terminating at all outlets where an earth is required. This earth wire shall comply with BS 7430:2011+A1:2015 but in no case less than 1.5mm^2 for lighting circuits and 2.5mm^2 for power circuits and High bays light fittings' circuits.

When drawing the wires and cables into the conduits or trunking, the Contractor must ensure that proper appliances are used so that the wires and cables suffer no damage whatever in the process. All joints and kinks shall be scrupulously avoided and care must be taken to ensure that the insulation of the cables receive no damage or abrasion. Low voltage cables and medium voltage cables shall be enclosed in entirely separate conduits.

All cables shall be drawn-in after the installation of the entire conduit system and after plaster has dried out. Raw wires shall not be threaded in at the time the conduits are being installed.

4.8 Cables, Wiring and Accessories

This section of the Specification includes the inspection, delivery to site, unloading, complete installation, putting into commission and handing over in the approved working order, the whole of the main and auxiliary power cables and other cables and wiring as detailed herein and in the tender.

The work includes the supply, delivery and erection of all cable racks, cable cleats, conduits, trunking, pipes, Unistrut and fittings required for the support and accommodation of the cables and wiring, grouting of rag bolts for the fixing of cable racks, supports, and all required trenching. The work also includes the installation of cables and wiring within the trenches, conduit, trunking and the proper protection, marking and terminations of all such cables.

Jointing of cables shall not be permitted under this contract, as the distances are short and therefore continuous cable lengths can be used. However, where joints are permitted by the Engineer for any reason they shall be of an approved type and manufacture and of the cast resin type. Where joints are required for control cables they shall be housed within a purpose made concrete pit with lid and jointed/terminated such that testing can easily and readily be carried out. The cables shall be as manufactured and tested in accordance with the appropriate International Standards as applicable, and the following Standards in particular shall apply: -

Copper conductors shall be provided throughout and shall comply with BS EN 60228:2005/IEC 60228:2004 or BS EN 13602:2013 or approved equivalent.

PVC (*Polyvinyl Chloride*) insulation and PVC sheath shall comply with BS 7655-0:2006/IEC 227-4 and BS 6346 or approved equivalent.

Non-armoured PVC insulated cables shall comply with BS 6004-2012/IEC 227-4 or approved equivalent.

Armoured cables with XLPE insulated copper conductors (*25 mm^2 cross sectional area or higher*) where used shall comply with BS 5467:2016/IEC 60502-1, IEC 60811 or approved equivalent.

The tenderer should submit a fully detailed technical description and manufacturing data of the cables offered together with full test certificates of all cables and wiring provided.

All cables shall be delivered to site in the same coils as despatched from the manufacturer and the labels showing size, type and length and shall be removed only in the presence of the Engineer or his representative and handed to him.

All cables and wiring shall be of adequate rating in accordance with the relevant IET Wiring Regulations BS 7671, protected in conduits or trunkings, placed on cable trays, in underground pipe ducts or trenches, or when cleated to Unistrut inserts etc. safe-guarded so as to prevent danger.

The Contractor shall agree with the Engineer and the Employer route of all cables, conduit and cable trunking and shall not install such trunking or conduits until agreement and approval has been given.

The main supply cables shall be extended from the LV switchboard position in the service areas. It will be Necessary for the Contractor to liaise with the Engineer when finalising the cable routes.

4.9 Trenching

All underground cables where not installed within pre-formed service trenches or service duct, shall be laid in pipes, ducts or buried directly in the ground, as specified for the particular case or as indicated on the Drawings.

The Contractor shall carry out all excavation, back filling, sanding, consolidation and making good, and shall remove all spoil and waste on completion. The Contractor shall include for the re-instatement of the grass and other areas such as roads and pathways where excavation has been Necessary to accommodate the installation of the various controls, alarm, power and external lighting cables.

The depth of trenches shall be such as to provide the cover set out hereunder. Trenches shall be free of large stones and similar material likely to cause damage to cables, and the bottom shall be level and smooth, consolidated if Necessary to provide a firm bed for cables or pipes. Pipes or cables shall be bedded in 0.08 m of sand or approved equivalent material which has been sifted through a No. 36 BS sieve, care being taken to ensure than cinders, breeze, or any other chemically active material does not come in contact with the cables at any point. After the laying of the cables or pipes, back-fill material initially consisting of a further layer of sand to provide a cover of approximately 0.08 m, which shall be consolidated as Necessary before final back filling and consolidation. All cables which are laid directly in the ground shall be protected by concrete or earthenware tiles.

(I) in open ground and under pavements, the minimum cover shall be 0.6 metres.

(ii) Under roadways subject to vehicular traffic, the minimum cover shall be 0.9 metres.

(iii) Minimum horizontal spacing between LV cables laid in common trench shall be 0.03 metres, and between LV cables and other services laid in common trench or run adjacent, the minimum spacing shall be 0.3 metres.

Where cables are laid under roads, pathways exceeding 0.90m width, and paved areas, they shall be installed in continuous runs of approved asbestos cement or glazed earthenware pressure piping, the pipes extending 600 mm on either side of the roads etc.

The routes of the cables buried underground shall be clearly and permanently marked by concrete cable markers, as detailed on the Drawings. These shall be positioned 100 mm to the right of each cable and installed such that the distance between markers is approximately 20m and one at every change to direction. Details to be agreed at site to suit final external distribution.

Cables shall be snaked between all terminations and junction boxes to allow movement and settlement of soil.

4.10 Laying of Cables in the Ground

Where installation involves laying of cables directly in the ground, the cables shall be protected with pre-cast concrete cover blocks, and shall be buried at least 1.0 m below ground surface. The locations of such cables shall be made evident by means of mass concrete marker posts inscribed with cast-in lettering of the word "CABLE" which shall be of dimensions and painted in colours approved by the Engineer. The marker posts shall be installed at all changes in straight horizontal alignment or at 50 m interval, whichever is the lesser; the marker posts shall be installed 1.0 m away from the cable with the lettered face parallel to and facing away from the cable.

4.11 Other Cable Installation Methods

Where cables are not laid directly in the ground or in prepared concrete trenches or ducts they shall be supported in reinforced Industrial nylon or aluminium alloy cable cleats bolted directly on the building walls or to vertical or horizontal mild steel channel supports embedded in the floor or walls. Fixing centres for supports shall not exceed 600 mm.

Where several control cables are run in a common route, they may be supported on galvanised, perforated steel trays in preference to individual supports detailed above. Cable tray supports shall be suspended from secure overhead fixtures at intervals not greater than 1000 mm, and groups of cables fixed to the cable tray by PVC or other approved saddles at intervals not greater than 500 mm. In sections where cables are laid directly in the ground, power and control cables shall not run together but shall take different routes. Where cables are installed inside cable trenches they shall be run on separate galvanised steel hooks fixed on the sides of the cable trenches at intervals of not more than 500 mm, Power and control cables shall run on opposite walls inside the cable trenches.

4.12 Depth and Separation of Cables

Cable trenches shall be excavated or ducts laid at such a depth that the minimum distance to the top of the cable trench or duct shall comply with the following:

Minimum Clearance

Type of Service	Vehicular Roadways	Open Ground or Foot Path
LV	1000 mm	750 mm
Others	750 mm	500 mm

Where possible, electric cables and associated ducts shall be installed such that subsequent excavation to expose another service will not disturb electric cables and ducts. Where it is not possible to separate two cables by installing them along different routes, the following clearances shall be observed along parallel routes:

Type of Cable	To HV Cable	To LV Cable	To Other Cable	To Gas/water etc lower voltages
HV	150 mm	300 mm	300 mm	300 mm
LV	300 mm	150 mm	250 mm	300 mm
Others	300 mm	250 mm	150 mm	300 mm

The spacing of cables installed at the same time shall be generally in accordance with the above table, but the Engineer may specify where circumstances permit a more economical arrangement.

As far as possible electric cables shall not be installed alongside other services except where otherwise directed. Where such segregation is not possible, then 50 mm thick concrete slabs may be constructed with the Engineers approval, to separate the services. Adequate slack shall be left at each bend of the cable laid directly in the ground.

Instrument and control cables shall as far as possible be routed separately from power cables and shall not be run on long distances on parallel routes or range to cross one another. A minimum separation of 250 mm shall be maintained between them. Power cables shall not be installed in the same ducts as instrument or control cables.

Separation between the three categories of cables shall be maintained as follows

Separation in mm

	Category 1	Category 2	Category 3
Category 1			
Instrument, Power and Control (*over 50 V under I 0 A dc or ac*)	-	200	300

Categor 2			
High level signals (*6 to 50 V dc*)	200	-	300
Categor 3			
Low level signals (*less than 5 V dc*)	300	200	-

Only conductors carrying signals of the same category shall be contained within any one multi-core cable.

4.13 Types of Cables, Conditions and Wiring

4.13.1 Power Cables

In general, these shall be multi-core cables, insulated with PVC single wire armoured and PVC outer sheath. These cables are 600/1000 volt class to BS 5467:2016/IEC 60502-1 and IEC 60811, the conductors being copper. The numbers of cores are as indicated on the Drawings and these cables shall be used for all LV distribution requirements where indicated.

PVC/XLPE/PVC cables, 600/1000-volt class to BS 5467:2012 for cable sizes of 25 mm^2 or higher shall be used where indicated.

4.13.2 Control/Alarm Cables

Multi-core control cables are PVC/XLPE and PVC sheathed overall where run in the ground with every core colour coded. Conductor sizes are to suit and details of cores and cable lengths are set out in the Drawings. Details of cable offered are forwarded with tender.

4.13.3 Domestic, Lighting and Small Power

In general, these shall be PVC insulated single core cables with stranded copper conductors, to meet the general requirements of the installation.

4.14 Terminations of Cables

The ends of each PVC/XLPE/PVC cable shall be terminated in brass compression-type cable-glands of the correct size which shall secure the cable inner sheath and ensure effective electrical continuity between the armour wires and the cubicle metal enclosure in which the cable is terminated.

Where cables are required to be terminated in terminal boxes or other items of Plant which have not been supplied by the Contractor, the Contractor shall be responsible for completing the terminations in accordance with the requirements specified above, including testing and verifying of the correct phase sequence of the cores.

Cables shall be identified inside all manholes at the cubicle terminations by tags made of brass, PVC or other types of insulating materials on 'which circuit identification marks shall be indelibly inscribed. Power cables shall have phase identification on each core done on tags made of crimped or sweated sockets of the correct size. Control and protection cables shall have each core identified by an insulated numbered ferrule.

All instrumentation cables shall have their armours or screens earthed at only one end preferably at the control cubicle end.

4.15 Cable and Wiring Test

On completion of the installation, the cables shall, in the presence of the Engineer or his representative, be subjected to the following tests as laid down in the IET Wiring Regulations BS 7671 and the Energy Act, 2006.

(a) Insulation level
(b) Polarity

4.16 Voltage Drop

The Contractor shall inspect, test and ensure that the size of every cable conductor is such that the drop in voltage drop between the origin of an installation and any load point should not be greater than the values as indicated below;

i) 3% for Lighting and 5% for other uses in Low Voltage installation supplied directly from a public low voltage distribution system

ii) 6% for Lighting and 8% for other uses in Low Voltage installation supplied from private LV supply.

The Contractor shall inspect, test and ensure that the final circuit wiring for small power and lighting circuits shall not be less than 4.0 and 2.5 mm^2 respectively as stated on the Drawings.

4.17 Conduits

Unless otherwise installed on site all concealed conduits used shall be black rigid super high impact heavy gauge Class ‘A’ PVC in accordance with BS EN 61386-1:2008. Where steel conduits are required these shall be deemed to be included in the Contractor's price.

Where surface conduits are to be installed, or conduits other than PVC specified for the various services, these shall be of the heavy gauge Class 'B' welded and screwed steel and shall comply with BS EN 61386-1:2008.

In general the installation shall be concealed throughout and shall be fixed by distance type saddles spaced at not more than 900mm apart.

Conduits installed on surface shall be supported with saddles every 60mm. Conduit runs in chases shall be firmly held in position by means of substantial pipe hooks driven into wooden plugs.

Conduit PVC connections shall either be by a demountable (screwed up) or adhesive fixed and made watertight. The tube and fittings must be clean and free of all grease before applying the adhesive. When connections are made between conduit and

switch boxes, care shall be taken that no rough edges or conduit stick out into the boxes.

Conduit accessories and fittings for the heavy duty PVC conduit shall match fully the requirements of the conduit used and shall be agreed. Conduit fittings for the steel conduits shall be malleable cast iron galvanised to BS EN 60601 & BS 7671 61386-1:2008 with extended spouts, internally treated and cover fixing lugs.

The drawings with these specifications indicate the approximate positions only of points and switches, and it shall be the Contractor's responsibility to mark out and centre on site the accurate positions where Necessary in consultation with the Engineer and the Employer. The Contractor shall be responsible for the accuracy of the final positions.

Conduit outlets and junction boxes, where used in conjunction with PVC conduit, are to be PVC manufactured to BS 4607-1:1984+A2:2010.

Outlet boxes for lighting fittings are to be of the loop-in type where conduit installation is concealed and the Contractor shall allow one such box per fitting, except where fluorescent fittings are specified when two such boxes per fittings are used.

Flexible conduit are manufactured to BS EN 61386-1:2008 galvanised and with PVC outer sheath.

It shall be entirely the Contractor's responsibility to ensure that conduits and other equipment, are installed at the appropriate stage of building progress, and no extra payment shall be made for chasing, boring, cutting or any other work arising from failure to meet this requirement.

Conduits are installed in such a manner that all cables can be drawn-in after erection by means of a draw-in tape.

Where a steel conduit system is required and specified the exposed outlet boxes shall be cast metal type and flush boxes shall be cast or sheet metal. No knockouts shall be removed unless used. Where conduits enter sheet metal boxes, they shall be lock-nutted back and front. Burrs and obstructions shall be removed before installation of boxes and conduits.

No conduit shall be smaller than 20mm nor shall accommodate more than 75% of the conductors permitted under the IEE wiring regulations.

Conduits to be concealed in structures cast-insitu are or shall be secured to the steel reinforcement work with heavy binding wire, spaced not more than 900mm to prevent movement of conduit boxes during the pouring and vibrating of the concrete. Outlet boxes shall be filled with paper to prevent ingress or concrete, and all boxes shall securely fixed to the shuttering with nails or other measures, which must not be visible after removal of the shuttering unless they later can be concealed e.g. by plaster. Conduits shall be installed after the chasing work has been completed. Couplings plugged with a suitable non-metallic stopping plug shall protect all open ends of conduit.

Conduit run in chases in walls or the like shall be fixed by means of mild steel pipe hooks or saddles spaced at not more than 900 mm. Where the conduit is concealed behind the plaster it shall be sunk 20 mm below finished plaster level before application of the plaster.

Surface conduit shall also be fixed 200 mm from boxes, the boxes themselves being securely fixed. Where such an arrangement of boxes and saddles would prove to be both unsightly and unnecessary, short lengths of conduit not exceeding 900mm between boxes need not be secured further than by connection to the adjacent boxes. In such cases the Engineer reserves his right to insist upon having additional fixings provided should he for any reason whatsoever consider additional fixings Necessary.

Special care should be taken to prevent dirt and plaster to enter any section of conduit system.

All bends in conduits shall be formed without any decrease or increase of the cross section diameter of the conduits. The radius of the bend shall not to be less than indicated by British Standard. For concealed work this radius should be increased. No manufactured tees, elbows, and bends will be permitted. All conduits shall be thoroughly cleaned for sharp edges.

The conduits shall be installed avoiding unnecessary bends or changes in directions. Conduits shall be laid in straight lines. Where straight rows of conduits are installed, inspection boxes shall be placed at not more than 15 metre intervals. There shall not be more than 4 easy bends or 2 right-angle bends between boxes.

Sub-mains conductor shall not be bunched in the same conduit as other circuits.

Lighting sub-circuits shall not be enclosed in the same conduit as general-purpose power sub-circuits.

Single-phase sub-circuits shall not be enclosed in the same conduit as three-phase sub-circuit.

4.18 Cable Trunking

The Contractor shall supply new install, test all single, two and three compartments cable trunking installed on the site to ensure that they are electrically and mechanically sound. All trunking are or shall be provided with removable covers of an agreed and appropriate length for handling, removal and servicing. The colour of the trunking shall be agreed to suit the Employer, the Contractor including in his prices for factory painting in a colour agreed with the Architect.

In general all trunking shall be manufactured by a renowned company. The cable trunking shall be made from hot galvanised sheet metal and approved to CEI 23-31 standards. It shall be factory painted externally where normally visible to match the finish of the walls as approved by the Architect and to suit the requirements of the other areas as agreed. A continuous cover of the same material are provided and fitted, for all areas except as for the laboratory trunking and cover screws so arranged that no sharp protrusions occur within the wiring space.

The mounting height of the trunking shall be agreed in general and shall be skirting in all working areas.

The trunking shall be complete with all supports, tee-pieces, angles, fixings, fillets, couplings, bends etc. as required and as Necessary to complete the installation.

The trunking shall be sized in compliance with the capacity Table issued by the B.E.S.A.; the Contractor shall therefore inspect and ensure that the size all trunkings comply with this requirement.

Each conduit take-off from the cable trunk shall be lock-nutted on both sides, with no excess conduit protruding into the cable trunk unless it is properly bushed.

The Contractor shall inspect and ensure that the maximum number of cables in the trunkings shall be that in aggregate would occupy 50% of the cross sectional area of the trunking.

UPVC trunking shall, unless otherwise specified be manufactured to BS EN 60601 & BS 7671 ISO 9001:2015. All sections shall be rigidly fixed together and fixed to building structure at intervals of not more than 1200mm.

4.19 Cable Tray

The Contractor shall inspect and test to ensure that cable trays are manufactured of perforated enamelled steel plate with returned flanges and with suspensions at intervals of not more than 1000mm. The final sizes shall be determined by the Contractor to suit the requirements of the installations.

4.20 Continuity

The Contractor shall inspect, test all conduits, cable trunking and cable tray to ensure that they are mechanically and electrically continuous throughout. Where steel conduits cross expansion joints, flexible steel conduit sections, PVC sheathed are inserted, or other approved means used to provide the Necessary continuity and flexibility.

4.21 Load Balancing

The Contractor shall test and ensure that the electrical load in respect of the entire installation is balanced to the satisfaction of KPLC and the Engineer. The Contractor shall carry out such alterations to the power offtakes at the switchboard and at the distribution/control cubicle connections as may be required to balance the electrical load of the installation.

4.22 Labels

All items of equipment, apparatus and the like should be clearly labelled, labels being as previously specified. Starters controlling motors shall be labelled identically such that the motor and starting are readily identified.

4.23 Earthing

The Contractor shall install, test and commission the entire earthing installation in accordance with the 17th Edition of IET Wiring Regulations (*BS 7671*). The entire system of metallic conduits and trunking, metallic sheaths of cables, cases and enclosures of switch-gear and electrical apparatus shall be connected to the earth point, according to the current rules and regulations. The Contractor is reminded that the resistance of the earth conductor from the earth-electrode to any point in the earthing system shall not exceed 0.5 ohms.

The Contractor shall supply and install all additional conductors, cables, tapes, earthing rods, inspection pits and all associated items for the installation of the complete earthing system.

The Contractor shall carry out earth resistivity tests to determine the best location for the main earth electrode. The results of such tests shall be clearly indicated on a site plan and submitted to the Engineer for approval 21 days prior to locating of the main earth electrodes.

The earth tape or cable between the main earth terminal and the earth electrodes shall be of high conductivity copper.

The earthing shall be carried out to an externally positioned inspection/earthing rod pits by means of copper tape (*25 x 3.5mm*) or the equivalent stranded copper conductor. The pits shall be complete with an inspection lid such that access to the rods shall be readily available. The number of pits or rods will be dependent upon the values recorded during the testing and it shall be deemed that the Contractor has included in his tender for all Necessary materials to meet the requirements.

The earthing requirements, while being in accordance with the power supply authority regulations, shall also be fully in accordance with the requirements of the Institution of Engineering and Technology, Wiring Regulations BS 7671: 2008, requirements for electrical installations, together with the British Standard Code of Practice BS 7430:2011+a1:2015.

The Contractor shall include for the bonding up complete of all sinks, taps, pipework, metal branches and other similar items as required by the IET Wiring Regulations, all details shall be agreed, this being particularly important in kitchen areas, pump houses and toilets.

4.24 Lightning and Transient Over-Voltage Protection

4.24.1 Scope of the Work for Lightning and Transient Overvoltage Protection

All lightning and transient overvoltage protection system shall be in accordance with British Standard BS EN 60601 & BS 7671 62305-1:2011. The Contractor shall supply, install, inspect, test and commission the system to ensure that the lightning and overvoltage protection system is electrically and mechanically sound and shall carry out any further improvement measures deemed Necessary as directed by the Engineer.

4.24.2 Lightning Conductor

This shall consist of 25mm x 3mm (1" x $^1/_8$") bare copper tape exposed, securely fixed and extending from the air terminates at the roof structure to the earth rods at the grounding point. Several test clamp points shall be installed at intervals of 10 m and at points as instructed by the Engineer. The Contractor shall inspect, test and commission to ensure that the whole lightning system is electrically and mechanically sound and will carry out any improvement measures deemed Necessary as directed by the Engineer.

4.24.3 Air Terminals

These shall consist of copper flat saddle. The saddle shall support a rod of length 800 mm and 15 mm diameter. At the top of the rod a triple pointed discharge rod of maximum 200 mm and 15mm diameter. The Contractor shall supply, install, inspect, test and commission to ensure that they are electrically and mechanically sound and carry out any improvement measures deemed Necessary as directed by the Engineer.

4.24.4 Test Clamps

These shall be provided for each down conductor and fixed at 1800mm (6' 0") from finish ground level and at intervals of 10 m to the air terminal. No connection should be made to earth tape below the test clamps, except to the earth rod.

4.24.5 Earth Rods

These shall consist of 15mm diameter hard drawn copper rods. Approximately 1.2 m long and shall be installed or driven into the ground at the position as directed on site by the Engineer. Each earth rod shall not be installed less than 3 metres from the column of the buildings. The head of the earth rods shall be installed in a concrete inspection pit with cover.

4.24.6 Connections

Connections between the various members of the termination network and to the down conductors shall be riveted and/or soldered, welded or made with mechanical clamps specifically designed for that purpose. Clamped joints shall be first cleaned, then inhibited from oxidation with a suitable non-corrosive compound.

The resistance of the earth system shall comply with the Regulation i.e. 10.0 ohms maximum. If the earth resistance with one earth rod is not satisfactory, then additional earth rods or an earth mat shall be provided as directed by the Engineer.

4.24.7 Transient over voltage protectors

The Contractor shall supply, install, test and commission appropriate transient overvoltage protectors on all power and telephone cables entering or leaving the houses, in order to protect equipment connected to power distribution system against transient over voltages coming into the houses from outside all as per the requirements of BS EN 60601 & BS 7671 62305-1:2011.

The entire lightning system shall be tested to BS 7430:2011+A1:2015 recommendations.

4.25 Testing and Commissioning

In addition to the requirements given under previous clauses of the Specification, the requirements given in this clause shall also apply to the inspection, testing and re-commissioning of the complete electrical installation.

The Contractor shall be responsible for testing and commissioning the electrical installation to ensure that it is in proper working order to the satisfaction of the Engineer.

After inspection, testing and commissioning the installations, each part of the system shall be subjected to tests in accordance with the relevant international standards and the requirements of the power supply authority. In addition to these tests, the whole of the installation shall be subjected to complete functional tests to the satisfaction of the Engineer.

Any defects, faults or omissions made apparent by such tests shall be corrected and re-tested to the satisfaction of the Engineer.

4.26 Temporary Electricity and Telephone Supplies

During certain elements of the works it may be Necessary to use the mains supplies and therefore the Contractor will be expected to provide temporary electricity and telephone supplies which shall be metered and paid for by him.

4.27 ANNEX 01: Specifying hospital electrical distribution systems

The electrical distribution system of a hospital may look the same as that for other types of buildings—offices, hotels, etc.—but there are several important distinctions. These distinctions are not so much in the equipment used. Panel boards, switchboards, transformers, circuit breakers, and other products are all common to other types of projects. The differences lie primarily in the size and complexity of the electrical systems: the overall size of the electrical system, its need for a higher level of flexibility, enhanced needs for more emergency power that can remain operational for longer durations, and the need for enhanced safety in the hospital environment.

4.27.1 Emergency versus essential power

Often the term "emergency" power is used to refer to all power needed on a generator in a hospital. A better term for this would be "essential" power. True, emergency power comprises only those loads required to be restored within 10 seconds as required by NFPA 70: National Electrical Code for all buildings, and as defined as life safety branch and critical branch by BS EN 60601 & BS 7671 for hospitals. For a hospital, you have the essential power supply, which would include the generator(s), and this power is divided into emergency system power and equipment system power. Then the emergency system is divided into the life safety branch and critical branch.

The size, complexity, and needs for emergency power in a hospital are only a few of the ways in which its power distribution system differs from that of other building types. Following are other ways hospitals differ from other types of buildings.

It should be noted that NFPA 99: Health Care Facilities Code also has specific electrical requirements for hospitals, but as these requirements are very close to those in BS EN 60601 & BS 7671, we will focus on these BS EN 60601 & BS 7671 requirements. One other code that affects generator design and installation is NFPA 110: Standard for Emergency and Standby Power Systems. This code is more specific to generator installation requirements (and not the emergency loads that must be connected to them) for the most part, but includes many other important requirements for generators.

BS EN requires that a portion of the building's electrical system be capable of providing emergency power in the event of normal power failure. This would include features such as exit/egress lighting, fire alarm systems, and other similar life safety functions. This can be done via a small generator (for larger buildings) or battery backup power. This amount of power is typically a very small portion of the building's total power consumption, about 5% to 10%.

BS also requires that hospitals be provided with emergency power. Again, as hospitals must remain open throughout normal power interruption and include patients who rely on emergency power for preservation of life, this article divides the emergency branch (same terminology as NEC Article 700) into two branches: the life safety branch and the critical branch (new terminology just for hospitals).

In a hospital, the life safety branch of the emergency power system is very similar to the requirement for other building types. It includes only the small amount of power necessary to allow for the safe evacuation of the public from the building in the event of normal power failure. This includes the exit/egress lighting and fire alarm systems—similar to other buildings—as well as other loads unique to the health care environment, such as medical gas alarm systems. It also includes generator set accessories loads (such as battery chargers and block heaters) that are Necessary to ensure proper starting and operation of the generator. Again, these loads would include a very small percentage of a hospital's total electrical system, typically 5% to 10% at most.

As we've discussed, unique to the hospital environment is the need to maintain patient safety during the loss of utility power. This is where the second branch of the emergency system, the critical branch, takes over. The hospital's critical branch is a much larger part of the electrical distribution system and handles loads such as much of the lighting and power outlets in patient rooms, intensive care rooms, operating rooms, post-anaesthesia care units (PACUs), nurse stations, pharmacies, labs, blood banks, and other similar types of spaces where patients are either directly cared for or services for these patients are arranged. Further, identifies two different types of patient care areas—general care and critical care—depending on the severity of the patient's needs. A general care area includes rooms such as a "normal" patient room or exam room where critical branch power is needed but the patient's condition is not severe. A critical care area then is exactly how it sounds: an area where the patient's care is more dependent on the hospital staff (and their need for more equipment and more emergency power). This includes operating rooms, labour/delivery rooms, intensive care units, trauma areas in emergency rooms, and so on. requires even more available power in general and also more emergency power for these types of spaces.

All these requirements for critical branch power further increase the size of a hospital emergency power system. Where life safety power would only be 5% of the building's power requirement, the critical power system of a hospital could easily account for 25% or more of a hospital's total power requirement.

In addition to "true" emergency power, other power needs in a building are also very important in the event of normal power failure but not necessarily needed for the preservation of life. This might include heating and refrigeration systems, ventilation and smoke removal systems, sewage disposal, industrial processes, and others whose interruption could create a hazardous condition or hamper rescue or fire-fighting operations. For all buildings, this is covered by BS EN Legally Required Standby Systems, and these systems must be restored to power within 60 seconds from loss of normal power. For a hospital, further defines these systems and calls them the equipment system.

BS EN doesn't specifically define which systems must be considered legally required standby but rather states that this designation should be made by the designer and/or authorities having jurisdiction (AHJ). As there are so many different types of buildings with different hazards, the designer and code reviewers must use discretion. However, for a hospital, these equipment systems are much better defined. They include large medical gas suction systems, elevators, kitchen hood supply/exhaust, ventilation systems (supply/return and exhaust) for patient care areas, heating for patient care areas, large sterilizers, and similar type loads. Again, the equipment system of a hospital can be a substantial part of the overall electrical system, especially as much of this system is the larger equipment loads such as elevators, large air handlers, and sterilizers. The equipment system can easily account for 30% or more of the overall hospital electrical system.

Even this equipment system power is further delineated based on the importance of the loads being served—into no delayed automatic, delayed automatic, and delayed automatic or manual connection. These distinctions can require a minimum of three automatic transfer switches (ATS) for the equipment system. The highest equipment system level is the no delayed automatic connection and includes only loads such as certain generator accessories. These loads (as the name suggests) must be automatically restored without delay upon loss of utility power (similar to emergency power). Note that these types of systems also may be connection to the life safety branch. (This would be a designer's choice and may depend largely on the size and complexity of these systems.) Next, equipment such as medical air vacuum pumps and compressors, smoke control systems, ventilation systems for operating and labour/delivery rooms, smoke control systems, and kitchen supply and exhaust systems must be automatically restored upon loss of utility power but are allowed to delay the emergency system restoration (typically under 1-minute delay). The final step of equipment power is allowed to have a delayed automatic connection (which would lag all other ATS) or even a manual connection to the generator system. This includes loads such as elevators, heating to patient care areas, automatic doors, sterilizing equipment, hyperbaric or hypobaric facilities, and other selected loads.

In summary, the total amount of emergency powe for most buildings (and therefore the amount of emergency distribution equipment needed) is typically 10% or less and consists of only that minimal amount of power needed to help people safely exit a building within the first few minutes of normal power interruption. For hospitals, emergency power becomes the life blood of a building without utility power and must be maintained throughout a power outage, which could last for days after a storm or other catastrophic event. As a result, it's not unusual to see the emergency power of a hospital exceed 50% or 60% of the building's total power needs. Also, as separate transfer switches are need for each type of load (life safety, critical, no delayed automatic equipment, delayed automatic equipment, and delayed automatic or manual connection equipment loads), multiple ATSs are always needed for hospitals. For a 200,000-sq-ft hospital, eight or more transfer switches could be used. A similarly sized office building would typically have only two ATSs.

4.27.2 All power outlets are not created equal

Many different types of power outlets are available today. Common types are general use, residential grade, commercial grade, specification grade, and hospital grade. Many of these designations have been developed by manufacturers to define the level of quality of these power outlets. Typically, a residential grade is lower quality than a commercial grade, a commercial grade is lower quality than a specification grade, and so on. The highest level of quality for power outlets is hospital grade. Hospital grade power outlets are manufactured to the highest standards to ensure grounding reliability, assembly integrity, overall strength, and durability. All patient care areas in a hospital are required to use hospital grade power outlets per BS EN 60601 & BS 7671. Further, it requires that hospital grade power outlets shall be marked to identify them as such. U.S. manufacturers typically mark a green dot on the front of the power outlets.

However, hospital grade power outlets are not required throughout a hospital; they are required only in patient care areas (such as, patient rooms, labour/delivery rooms, etc.). They are not required in offices, nurse stations, labs, pharmacies, or other areas in the hospital, but they are commonly used in all rooms of a hospital to provide the highest quality of power outlets with the longest life and durability.

4.27.3 Grounding is twice as important

Grounding is an issue that is often misunderstood when discussing electrical distribution systems, and it's not the intent of this article to define or explain grounding in-depth. From a simplistic point of view, the grounding of an electrical system is needed for many reasons such as establishing the voltage reference point and enhancing the safety of the electrical system by providing a return path for stray voltage/current in the system (and therefore keeping it away from you). For most buildings, every branch circuit (defined as the last wiring from any panel or other source to the final point of use) must be grounded. For the purpose of illustration, think of branch circuit wiring as the wire just behind the electrical receptacle or connected to the light fixture in your house or office. It is the wiring that touches the electrical devices you touch. Poor grounding at this level can lead to the possibility of you being shocked when plugging in (or unplugging) your radio, phone, or other equipment.

Furthermore, even though all ground buses in every panel should theoretically be at the same reference point (or zero voltage point), there is always the possibility of very slight voltage differences between multiple panels grounding reference. As a result, BS EN 60601 & BS 7671 requires that any panels that serve the same patient area must have another grounding path (wire) connected their ground buses to eliminate the possibility of even the smallest trace of any

stray voltage that could be introduced to a patient. This is another requirement distinct to the hospital environment.

There are two acceptable means for providing grounding for branch circuit wiring per BS EN 60601 & BS 7671. One is by the use of a dedicated grounding wire being run with the other wires in the circuit (the famous green or sometimes bare wire any amateur electrician knows). The second method is the use of metallic boxes and metallic conduits throughout the branch circuit that are rated to provide an effective ground path back to the electrical source.

Anyone who has ever been shocked by an electrical appliance (meaning that stray voltage used them as a grounding path instead of a grounding wire or conduit system) can tell you that it is no fun. Unfortunately, these incidents can sometimes lead to injury or even death, depending on other conditions. Obviously, these concerns are greatly magnified for someone who is already in a weakened state due to illness or injury. As a result, BS EN 60601 & BS 7671 requires that all branch circuits serving patient care areas must have both types of grounding installed (grounding wire and the use of metal raceway throughout)—often referred to as redundant grounding. This further enhances the safety of the electrical system for the patient (and the hospital staff).

4.27.4 Protection of the emergency system

Another requirement for hospitals in BS EN 60601 & BS 7671 is the need to provide mechanical protection of the emergency system (this would apply to life safety and critical branch power). This code greatly reduces the available methods for the wiring and conduit systems of emergency power branch circuits. In non-patient-care areas (where redundant grounding is not required), methods include mineral insulated cable (very expensive, fire rated cabling), PVC Schedule 80 conduit, or conduits such as PVC Schedule 40 and some flexible metal conduits where installed in 2 in. of concrete.

Typically, only nonflexible metallic conduit is allowed in patient care areas due to the need to provide redundant grounding and protection of the branch circuit. There are a few exceptions; the BS EN 60601 & BS 7671 does allow flexible conduit for specific applications where nonflexible metallic conduit is not possible due to the need for flexibility. There is even a specific flexible “health care grade” ac cable manufactured just for hospitals (where the flexible metal jacket is still rated as a grounding path and a separate grounding conductor is installed within) for these applications.

4.27.5 Breaker coordination

Another code requirement that adds significant complexity to the design of hospital electrical systems is that of overcurrent coordination of the emergency system. This requirement is actually found in BS EN 60601 & BS 7671, which applies to all building types. However, as mentioned previously, the emergency system for most buildings is a very simple one concerned primarily with small loads such as lighting, fire alarm, and other similar loads. In a hospital, the amount of emergency power and the larger size of the distribution equipment needed further complicate this issue, as close to half (or more) of the panels and breakers in a large hospital may be connected to life safety and critical branch power. The need to provide overcurrent coordination requires much more design attention to ensure that downstream breakers will open (trip) prior to larger upstream breakers so that any disruption of emergency power is minimized. Although this may seem simple enough, the tolerances of breakers is such that often larger electrical distribution equipment is needed to provide coordination than may be required based on the loads being served. This further increases the cost of the electrical system and may also affect the physical size of the equipment.

4.27.6 Ground fault protection

Ground fault protection (GFP) is the sensing of current on an electrical system to ensure that there is not a dangerous ground fault occurring downstream in the electrical system. By comparing outgoing current (on the phase conductors) with neutral currents (the "return" current), GFP devices can determine if any current is being lost in the system (i.e., a fault condition). If this is the case, the GFP protection will open a breaker (typically the main breaker) and interrupt power to the system.

The BS EN 60601 & BS 7671 requires GFP on the system's main circuit breaker for solidly grounded systems of 1,000 A or more with a line-to-ground voltage of 150 V or more. As most electrical services in US buildings of sufficient size are 480 V line-to-line (which equals 277 V line-to-ground) and 1,000 A or more, this GFP is often required.

For a hospital, however, BS EN 60601 & BS 7671 expands the GFP provisions and requires two levels of GFP protection. So in a hospital, if an electrical service needs GFP due to voltage and size of the system, the main breaker and all the feeder breakers in the electrical service must be protected by GFP. This serves to enhance reliability by removing only one feeder (through which the fault is travelling) instead of removing power from the whole service (by tripping the main breaker for the system). Similar to overcurrent coordination, this is another case where the code recognizes the need to isolate an electrical condition in a hospital electrical system in order to minimize any power disruption. Where RCDs are required, only type A (complying with BS EN 61008 or BS EN 61009) or type B (complying with IEC 62423) shall be selected, depending on the possible fault current arising.

4.27.7 Electrical systems unique to hospitals

Although most electrical equipment in hospitals is common to other building types, there are some systems unique to hospitals—notably, isolated power systems. Originally introduced in hospitals due to the use of flammable anaesthesia (commonly ether) many years ago, these systems were once mandatory in all areas where anaesthesia was used. Flammable anaesthesia hasn't been used in hospitals for many years, but isolated power systems remain for some applications. BS EN 60601 & BS 7671 requires the use of isolated power systems in "wet" locations where power disruption cannot be tolerated. The BS EN 60601 & BS 7671 code leaves the determination of wet locations to the hospital's discretion, but areas commonly considered to be wet include some general surgeries, open heart surgery, orthopaedic surgeries, and cystoscopy. Please note that the 2012 edition of NFPA 99 recently included in its requirements that all operating rooms are identified as wet locations unless a risk assessment has been provided to ensure that fluids within the space will cause no danger to patient or staff (Section 6.3.2.2.8.4). As a result of this revision, the use of these complex electrical panels will likely increase significantly in future hospital projects.

Isolated power systems serve to reduce the risks of electric shock hazards from patients' or staff members' inadvertent contact with stray voltage and allow for the safe continuation of electrical appliance use in the event of a low-level fault condition where loss of power could affect patient safety. These systems are also designed to limit the leakage of electrical current in the system (which is very small but common in any electrical system) that may cause an electrical shock. Though such a shock is normally very small and poses little risk of harm, it becomes magnified in a wet location or with a patient more susceptible to any contact to even very minor stray voltage (such as a patient in a heart surgery where any voltage introduced to the heart could have fatal consequences). Further, these systems are capable of monitoring even these smallest amounts of leakage current (under 5 mA, or five one-thousandths of an amp) and providing alarms of dangerous levels of leakage current. As you may imagine, the use of these complex electrical systems in a hospital adds significant costs and maintenance issues.

SECTION H

HEATING VENTILATION AND AIR-CONDITIONING INSTALLATIONS SPECIFICATION

1 PART B

1.1 GENERAL MECHANICAL SPECIFICATION

1.1.1 GENERAL

This section specifies the general requirements for plant, equipment and material forming part of the Sub-Contract Works and shall apply except where specifically stated elsewhere in the specification or on the contract Drawings.

1.1.2 QUALITY OF MATERIALS

All plant, equipment and materials supplied as part of the Sub-contract works shall be new and of first-class commercial quality, shall be free from defects and imperfections and where indicated shall be of grades and classifications designated herein.

All products or materials not manufactured by the Sub-contractor shall be products of reputable manufacturers and so far as the provisions of the Specification is concerned shall be as if they had been manufactured by the Sub-contractor.

The Sub-Contractor as called for by the Specification and Contract Drawings shall supply materials and apparatus required for the complete installation unless mention is made otherwise.

Materials and apparatus supplied by others for installation and connected by the Sub-Contractor shall carefully be examined on receipt and stored. Should any defects be noted, the Sub-Contractor shall immediately notify the Engineer

Defective equipment or that damaged in the course of installation or tests shall be replaced as required to the approval of the Engineer.

1.1.3 REGULATIONS AND STANDARDS

The Sub-Contract Works shall comply with the current edition of the following:-

i) The Kenya Government Regulations
ii) The United Kingdom Institution of Electrical Engineering (*IEE*) Regulations for the electrical equipment of buildings.
iii) The United Kingdom Chartered Institute of Building Services Engineers (*CIBSE*) Guides.
iv) British Standards and Codes of Practice as published by the British Standards Institution (*BSI*).
v) The Local Council By-laws.
vi) The Electricity supply Authority By-Laws.
vii) Local Water Authority By-Laws.
viii) The Kenya Building Code of Regulations.

1.1.4 ELECTRICAL REQUIREMENTS

Plant and equipment supplied under this Sub-Contract shall 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 a main isolator.

The supply power up to and including local isolators shall be provided and installed by the Electrical Sub-Contractor. All other wiring shall be as described in the "Particular Specification".

The Sub-Contractor shall supply three copies of all schematic, cabling and wiring diagrams for the Engineer's approval.

The starting current of all electric motors and equipment shall not exceed the maximum permissible starting currents described in Kenya's power utility Company's 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 volts, 50Hz, 3-phase or 240 volts, 50Hz 1-phase as specified in the "Particular Specification".

The Consultant may reject any equipment that is not rated for the above voltages and frequencies

1.1.5 TRANSPORT AND STORAGE

All plant and equipment shall, during transportation be suitably packed, crated and protected to minimise the possibility of damage and to prevent corrosion or other deterioration.

On arrival at site, all plant and equipment shall be examined and any damage to parts and protective priming coats made good before storage or installation.

Adequate measures shall be taken by the Sub-Contractor to ensure that plant and equipment do not suffer any deterioration during storage.

Prior to installation all piping and equipment shall be thoroughly cleaned.

If, in the opinion of the Consultant any equipment has deteriorated or been damaged to such an extent that it is not suitable for installation, the Sub-Contractor shall replace this equipment at his own cost.

1.1.6 SITE SUPERVISION

The Sub-Contractor shall ensure that there is an English-speaking supervisor on the site at all times during normal working hours.

1.1.7 INSTALLATION

Installation of all special plant equipment shall be carried out by the Sub-Contractor under adequate supervision from skilled staff provided by the plant and equipment manufacturer or his appointed agent in accordance with the best standards of modern practice and to the relevant regulations and standards described under Clause 3 of this section.

1.1.8 TESTING

3.1.8.1 GENERAL

The Sub-Contractor's attention is drawn to Part "A", Sub-Clauses 1.44 and 1.45 Page 1-11 and 1-12 respectively of the "Preliminaries and General Conditions".

The following sub-clauses are intended to define the Sub-Contractor's responsibilities with respect to testing and inspection.

3.1.8.2 MATERIAL TESTS

All material for plant and equipment to be installed under this Sub-Contract shall be tested, unless otherwise directed, in accordance with the relevant B.S. specification concerned.

For materials where no B.S. specification exists, tests are to be made in accordance with the best modern commercial methods to the approval of the Engineer, having regard to the particular type and application of the materials concerned.

The Sub-Contractor shall prepare specimens and performance tests and analyses to demonstrate conformance of the various materials with the applicable standards.

If stock material, which has not been specifically manufactured for the plant and equipment specified is used, then the Sub-Contractor shall submit satisfactory evidence to the Consultant that such materials conform to the requirements stated herein in which case tests of material may be partially or completely waived.

Certified mill test reports of plates, piping and other materials shall be deemed acceptable.

3.1.8.3 MANUFACTURED PLANT AND EQUIPMENT - WORKS TESTS

The rights of the Consultant relating to the inspection, examination and testing of plant and equipment during manufacture shall be applicable to the Insurance Companies or Inspection Authorities so nominated by the Engineer

The Sub-Contractor shall give two weeks' notice to the Consultant of the manufacturer's intention to carry out work tests and inspections.

The Consultant or his representative shall be entitled to witness such tests and inspections. The costs of such tests and inspections shall be borne by the Sub-Contractor.

Six copies of all test and inspection certificates and performance graphs shall be submitted to the Consultant for his approval as soon as possible after the completion of such tests and inspections.

Plant and equipment which is shipped before the relevant test certificate has been approved by the Consultant shall be shipped at the Sub-Contractor's own risk and should the test and inspection certificates not be approved, new tests may be ordered by the Consultant at the Sub-Contractor's expense.

3.1.8.4 PRESSURE TESTING

All pipe work installations shall be pressure tested in accordance with the requirements of the various section of this specification. The installations may be tested in section to suit the progress of the works but all tests must be carried out before the work is buried or concealed behind building finishes. The Consultant or his representative must witness all tests and the Sub-Contractor shall give 48 hours notice to the Consultant of his intention to carry out such tests.

Any pipe work that is buried or concealed before witnessed tests have been carried out shall be exposed at the expense of the sub-contractor and the specified tests shall then be applied.

The Sub-Contractor shall prepare test certificates for signature by the Consultant and shall keep a progressive and up-to-date record of the Sections of the work that have been tested.

1.1.9 COLOUR CODING

Unless stated otherwise in the Particular Specification all pipe work shall be colour coded in accordance with the latest edition of B.S. 1710.

1.1.10 WELDING

3.1.10.1 PREPARATION

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

3.1.10.2 METHOD

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

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

3.1.10.3 WELDING CODES AND CONSTRUCTION

All welded joints shall be carried out in accordance with the following specification:-

a) Pipe Welding
   All pipe welds shall be carried out in accordance with the requirements of B.S.806.
b) General welding
   All welding mild steel components other than pipe work shall comply with the general requirements of B.S. 1856.

3.1.10.4 WELDERS QUALIFICATIONS

Any welder employed on this Sub-contract shall have passed the trade tests as laid down by the Government of Kenya.

The Consultant may require seeing the appropriated certificate obtained by any welder and should it be proved that the welder does not have the necessary qualifications the Consultant may instruct the Sub-Contractor to replace him by a qualified welder.

2 PART C

2.1 GENERAL MECHANICAL VENTILATION SPECIFICATIONS

2.1.1 GENERAL

This section specifies the general requirements for the manufacture and installation of low velocity/medium pressure air systems forming part of the Contract Works. This section shall apply except where specifically stated otherwise in the Particular Specification or on the Contract Drawings.

2.1.2 SHEET METAL DUCT WORK

4.1.2.1 MATERIAL

Ductwork within the building shall be fabricated from strip mill cold-reduced mild steel sheet continuously hot-dip galvanised in compliance with B.S. 2989: 1975.

Ductwork external to the building shall be fabricated from cold-rolled, close-annealed or cold reduced black mild steel sheet and galvanised after manufacture in compliance with B.S. 719: 1971.

4.1.2.2 CONSTRUCTION

All ductwork shall be manufactured in accordance with the Heating & Ventilating Contractors' Association, (HVCA) U.K., and Specification: DW/142: 1982, except where specifically stated otherwise in the particular Specification or on the Contract Drawings.

Ductwork material gauge and stiffening shall be in compliance with the requirements set out in Table A.

Table A

Length of Side (mm)	Nominal Sheet Thickness (mm)	Maximum Spacing Between Joints/Stiffeners		Minimum Angle section for Intermediate Stiffeners (mm)
		Without Beading Cross or Breaking or (mm)	With Beading Cross- Breaking (mm)	
Up to 400	0.6	Unlimited	Unlimited	None
400 to 600	0.6	1,500	Unlimited	25 x 25 x 3
601 to 800	0.8	1,500	Unlimited	25 x 25 x 3
801 to 1,000	0.8	1,200	1,500	25 x 25 x 3
1,001 to 1,500	1.0	800	1,200	40 x 40 x 4
1,501 to 2,250	1.0	800	800	40 x 40 x 4
2,251 to 3,000	1.2	600	600	50 x 50 x 5
For Ducts Galvanised after Manufacture				
Up to 300	1.2	As Equivalent Sizes above		
301 and over	1.6	As Equivalent Sizes above		

4.1.2.3 JOINTS

Cross joints for ducts up to 500 mm narrow side shall be `C' cleat type and sealed with liquid/mastic sealant.

Cross joints for ducts with narrow side in excess of 500 mm shall be reinforced standing seam.

Longitudinal seams shall be of the lock form type of riveted spot/plug welded lap seams.

4.1.2.4 BENDS

All bends shall have a centre line radius of one and one half times the duct width.

Where radius bends will not fit, square bends shall be provided, with air turns fitted by riveting or welding. The number of vanes shall be none in ducts up to 300mm wide, one in ducts 301mm to 500mm wide and two in ducts above 500mm to 1000mm wide and three in ducts above 1000mm. The vanes shall be positioned in accordance with fig. 1, 2, 3 and 4 of HVAC Specification DW/142: 1982.

4.1.2.5 TRANSFORMATION

Transformation and taper pieces shall, where the cross-section area is unchanged have a maximum slope of 22.5 degrees on any side. Where the Cross-sectional area is temporarily reduced up to 20 per cent, the maximum slope shall be 15 degrees.

4.1.2.6 BRANCHES

For branch ducts up to 400mm wide the take-off piece shall be tapered at 45^0 in the direction of the air flow in accordance with fig.61 of HVAC Specification DW/142.

For branch ducts over 400mm wide the take-off piece shall be of radius pattern with, where space permits, a minimum inner radius of half the branch duct width.

4.1.2.7 AIR TIGHTNESS

All ductwork shall be constructed and jointed in such a manner that air-tightness requirements are fulfilled and allowable leakage shall not exceed ten per cent of total air flow at highest fan pressure. The allowable leakage shall not be concentrated at one point of the system.

4.1.2.8 ACCESS

Sufficient number of access doors and hand-holes shall be provided in the ductwork for the purpose of maintenance, inspection, cleaning and entry of test equipment.

Access doors shall be of the hinged type and door openings in ductwork shall be adequately stiffened and made air-tight with purpose-made rubber gaskets around the door perimeter.

4.1.2.9 CONNECTIONS

Brass screwed connections shall be provided on the ductwork for thermostats, humidistats, thermometers, etc., in positions indicated on Contract Drawings. The connections shall be provided with an air-tight rubber seal.

4.1.2.10 TEST HOLES

Test holes shall be provided in all branch ducts and in the main duct on the discharge side of the fan. The holes shall be suitably spaced in accordance with B.S. 848: Part 1, on a straight length of ductwork and, where possible, not less than two metres downstream of any bends or dampers.

After completion of the testing, proprietary metal or plastic plugs shall be fixed to all test holes. The use of rubber or cork bungs shall not be permitted.

4.1.2.11 HANGERS AND SUPPORTS

Ductwork hangers and supports shall be manufactured from rolled mild steel angles or channel sections and shall be of the drop rod or cantilever type. The table below sets out construction and spacing details.

Supports for insulated ductwork shall not be connected directly to the duct stiffening or flanges. The insulation and vapour barrier should be abutted to insulator incorporation with the bearing support. The insulator shall be made from rot and vermin-proof hardwood.

Length of Longer Side (mm)	Drop Rod M.S. Rod Diameter (mm)	Hanger M.S. Flat (mm)	Minimum Bearing (mm)	Maximum Spacing (mm)
Up to 501	10	25 x 3	25 x 3 Flat or 25 x 25 x 3 Angle	3.0
501 to 800	10	25 x 3	40 x 40 x 5 Angle	3.0
801 to 1000	10	25 x 3	40 x 40 x 5 Angle	2.5
1001 to 2500	10	25 x 3	50 x 50 x 6 Angle	2.5
2,251 and Over	to suit loading			

4.1.2.12 DUCTWORK THROUGH BUILDING FABRIC

Where duct work passes through building fabric, the connections shall be by built-in galvanised sheet metal sleeves of the same thickness as the duct.

The sleeve ends shall be finished with mating flanges. Joints between mating flanges shall be fitted with sealing gasket or mastic sealant.

4.1.2.13 PROTECTIVE FINISHES

Within the building, ductwork flanges, stiffeners, hangers, supports, etc. shall be painted with two coats of red oxide or zinc chromate paint before fixing.

Outside the building, ductwork steel sections shall be painted with one coat of red oxide followed by two coats of bituminous paint.

All paints shall be used in accordance with the paint manufacturer's recommendations.

2.1.3 FLEXIBLE CONNECTIONS

Where fans or similar equipment are connected to the ductwork system, the connection shall be made with heavy-duty rot and vermin-proof neoprene or rubberised canvas.

Flexible connections shall be secured by a pre-drilled mating flange. When exposed to outside weather the flexible connection shall suitably be protected from rain.

2.1.4 AIR VOLUME DAMPERS

These shall be provided where indicated on the Contract Drawings.

Damper blades shall be of rigid construction without sharp edges and shall be substantially air-tight.

Butterfly dampers shall be used only where the longer side of the rectangular duct does not exceed 300mm. The damper spindle shall extend to the outside of the duct and shall be provided with locking device on the outside of the duct.

For rectangular ductwork having longer side in excess of 300mm, multi-leaf dampers shall be used. All multi-leaf dampers shall be constructed in demountable ductwork sections, which shall extend beyond the swing of the blades. Provisions shall be made for linkages to connect the multiple extended spindles.

The `OPEN' and `CLOSED' damper positions shall be clearly marked on all dampers.

2.1.5 FIRE DAMPERS

Automatic fire dampers shall be provided where indicated on the Contract Drawings.

These shall be of stainless steel multi-blade construction to provide positive closure and stainless steel spring operated through a fusible link rated at 72^0C.

The damper casing shall be of galvanised 16 gauge steel, with continuously welded corners and spigot connections.

The fire dampers supplied must accompany certification from a recognised fire authority.

2.1.6 DUCT THERMAL INSULATION

4.1.6.1 GENERAL

All supply air ductwork shall be insulated.

Recirculated and exhaust air ductwork within conditioned space shall not be insulated.

Outside the conditioned space both the supply and the recirculated air ductwork shall be insulated.

4.1.6.2 DUCTWORK WITHIN CONDITIONED SPACE

Insulation shall be 25 mm thick expanded polystyrene sheet or spray applied polyurethane foam to a uniform thickness of 25mm.

Polystyrene shall be fixed so that the edges butt without gap and the insulation shall overlap at corners by the thickness of the insulation. The Polystyrene sheet shall be fixed by means of a suitable adhesive and plastic impingement pins attached to the ductwork.

The insulation shall be effectively vapour-sealed by application of two coats of anti-condensation paint.

4.1.6.2 DUCTWORK IN PLANT ROOMS

The insulation shall be identical in all respects to the requirements laid down in Clause 4.06 B with the exception that the insulation shall be finished with 15mm thick layer of hard setting plastic compound trowelled to a smooth finish.

All corners shall be protected by setting in a 1mm thick aluminium angle strip into the hard setting finish.

Insulation of all connecting flanges, access hatches and all other places where operation or maintenance is likely to cause the breaking of insulation shall be levelled at an angle of 45^0.

4.1.6.3 DUCTWORK EXTERNAL TO PLANT ROOM

The insulation shall be identical in all respects to the requirements laid down in Clause 4.06 B with the exception that the insulation shall be finished with two coats of bitumastic paint and clad with 0.80mm thick polished aluminium sheeting.

The cladding shall be fixed in lengths of not less than 1.8 metres and the longitudinal seam shall have an overlap of 25mm and be screwed by self-tapping screws as described above. Joints between lengths of cladding shall be made with a 25mm overlap and sealing with bitumastic and self-tapping screws as described above. At bends the cladding shall be mitred and each section of mitre shall contain an overlap to permit sealing with bitumastic and securing with self-tapping screws as described above.

Joints between lengths of cladding shall be made with a 25mm overlap and sealing with bitumastic and self-tapping screws.

4.1.6.4 DUCT ACOUSTIC/THERMAL INSULATION

Where shown on the Contract Drawings, ductwork shall be internally insulated and insulation shall serve as both thermal insulation and sound attenuator.

Insulation shall be 25mm thick, 24 kg/m^3 density, flame-attenuated glass fibre bonded with thermal setting resin as manufactured by Newalls Insulation Co. Ltd. U.K.

The insulation shall in particular comply with Fire Classification Class 1 surface spread of flame, B.S. 476: Part 7, be hundred per cent non-hygroscopic, shall not be subject to any fibre migration for air velocities up to 25 m/s, and be suitable for temperature range of + 5^0C to + 50^0C.

The insulation shall be fixed in strict compliance with the manufacturer's installation recommendations.

2.1.7 VIBRATION ISOLATION

The Contractor shall be responsible for ensuring that sufficient provision is made to prevent the transmission of vibration from all equipment to the supporting structure and interconnected items of the complete system. It is deemed that the tenderer has included for this requirement in his pricing.

2.1.8 DUCTWORK INSPECTION AND TESTING

4.1.8.1 GENERAL

No ductwork shall be insulated or covered in any manner prior to inspection and testing.

The Contractor shall give adequate notice to the Engineer of his intention to carry out tests in order that such tests can be witnessed by the Engineer.

4.1.8.2 DUCTWORK - TESTING FOR AIR TIGHTNESS

The Contractor shall provide a suitable variable speed portable fan and effective sealing caps for this purpose.

Air leakages shall not exceed the figures stated in the table below:

Working Pressure of Fan (N/m^2)	Leakage ($m^3/m^2.hr$)	Test Pressure (N/m^2)
0 – 390	4	196
390 – 980	8	685

4.1.8.3 DUCTWORK - TESTING OF FLOW RATES

All fans installed under this Contract shall be charged with 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. The complete system shall be balanced by means of dampers and other special controls so as to give the required air flows.

Test flow rates must be obtained within ± 5% of the design figures.

Flow rates delivered at air terminals may be measured by the use of a vane anemometer. Flow rates in main and branch ducts shall be measured by the use of a pilot-static tube, through holes of suitable size and spaced in accordance with B.S. 848.

SECTION 3

PARTICULAR SPECIFICATIONS OF MATERIALS AND WORKS

These specifications apply for the Generator set

3.01 **GENERAL**:

The work covered by this Specification includes the supply, delivery, installation, setting to work, commissioning to the satisfaction of the Engineer and maintenance for a period of twelve months 1 No. 250 kVA diesel engine generating set with sound proof for standby output at 415/240V and 50 Hz.

The sets shall be supplied complete with control panels, sound attenuated enclosures (*to IP23*) (*sound proof attenuator*) designed to limit the noise level to a **maximum of 18dBA to 25dBA at full load measured at 7 metres (*Level II Sound Attenuated Enclosure*)** and all ancillary equipment necessary for its operations.

The following shall be done to electrical engineer's approval:
The sets shall be designed and supplied with heavy structural steel bases for bolting unto concrete plant plinths on robust anti-vibration and shock absorbing devices. They shall have adjusting screws for optimum setting and levelling and be so designed and installed that no appreciable engine vibration shall be transmitted to the floors or to any surroundings.

Engines and alternators shall be flanged together in true alignment so that no further alignment shall be necessary on site.

The construction of any generator room/house, the foundations and the provision of fixings for the bolting down of the set shall be carried out by the Building Contractor. The Generator Contractor shall provide early enough full details of fixing requirements.

Unless otherwise indicated, the set shall be capable of operating in a medium dust-laden atmosphere as defined in BS ISO 5011:2014 and in accordance with BS EN ISO 10581:2013.

The equipments and all components shall be suitable for operation in ambient conditions of 5° to 40° and up to 100% relative humidity in an unheated ventilated building at an altitude of 1750 m above sea level.

Within the operating conditions specified, the set, equipped with the standard air intake filters, shall be capable of delivering the specified output continuously at rated voltage and 0.8 lagging power factor and of delivering 10% in excess of the maximum rating for a period of one hour.

The steady state voltage shall be maintained within 2½% of the rated voltage, from no load to 10% overload and from unity to 0.8 lagging power factor. Sudden removal of the full load at rated frequency shall not cause the frequency to rise above 110% of rated frequency. If full load is then re-imposed, the frequency shall not fall below 94% of rated frequency.

All components shall be fully tropicalized and protected against mould growth.

All ferrous m tal work shall be either painted or proc ssed to give a rust-proof coating of heat and oil resisting quality.

3.02 ENGINE

Within the limits of the operating conditions specified, both engines, equipped with its standard air intake filter shall be capable of delivering 200 kW for a period of one hour.

The governor shall be able to maintain the frequency between 94% and 110% at any change of load.

Unless otherwise indicated, the engines shall be designed for satisfactory operation on fuel oil complying with BS 2869:2010+A1:2011.

No significant critical speed of the complete shaft system, including the generator, shall be within 15% on the rated speed.

A manually reset over speed trip shall be fitted to stop the engine if its speed exceeds the rated speed by 15%. A mechanical trip is preferred but an electrical over speed trip may be offered. Both types may be equipped with a pair of contacts which close on operation of the trip. If the device is belt driven, at least two belts shall be provided and the drive shall be capable of carrying full load with one belt removed.

3.03 STARTING

Starting shall be by means of electricity supplied from maintenance-free batteries. The starter motors shall be of the axial type, de-energized by a device operated from the engine.

Suitable means shall be provided for turning by hand the engine mean shaft and the associated generator to facilitate inspection and overhaul.

3.04 MAINTENANCE

The Contractor shall maintain the complete sets and associated control equipment forming the unit for a period of twelve calendar months from the date that the unit is put into commission and regular use.

During this maintenance period, the Contractor shall at his own expense:

(1) Make good any defects in the units and replace any parts that fail or show signs of weakness or undue wear in consequence of faulty design, workmanship or materials.

(2) Visit the site and with all diligence attend to any such defect that arises within 48 hours of receiving notification of the defect.

(3) Carry out regular examination and servicing of the unit every three months, the service and examination to include all necessary adjustments, greasing, oiling, cleaning, changing of lubricating oils (*Where necessary*) to keep the unit in sound and efficient working order.

(4) Instruct the maintenance personnel in the proper operation, care and maintenance of the set and its equipment.

If during the maintenance period the unit is, or is likely to be, out of use for a period greater than 48 hours, due to the unit or part thereof developing a defect attributable to faulty design, workmanship or materials, or neglect of maintenance by the Contractor, the Contractor shall, at his own expense, immediately provide and install on free loan a suitable temporary unit for use until the required repair or replacement has been satisfactorily undertaken and the original set (or its replacement) put into proper working order.

At the end of the twelve months period of maintenance, the Contractor shall (*in addition to the normal quarterly servicing work*) carry out a comprehensive examination and test on the set and its auxiliaries, including the checking of the operation of controls and safeguards, to ensure that the unit is in proper working order and in satisfactory condition for handing over to the client whose representative shall be present at such examination and test.

(5) Check that all radiator and engine block water drain points are free from sludge and other blockages.

(6) Check engine bolts, main drive couplings, valve clearances, fuel pump settings, governor settings, pipeline connections, water houses, exhaust couplings, flexible pipework, etc., and, where a separate cooling water tank is fitted, that the water level is satisfactory and the ball valve and overflow work.

(7) Check all outgoing connections on the generator set and at the control panel. All lugs for principal connections shall have clean and bright contact surfaces. A suitable abrasive material shall be used where necessary.

(8) Check access panel and doors for proper opening and closing and for the functioning of any interlocks fitted.

(9) With the set isolated from the doors for proper opening selector switch in the 'Manual position, start the engine by means of the 'Start' push button and allow it to run up to normal speed. Check that during the time the engine starter motor is in operation, the mains battery charger is automatically switched off to avoid its being overloaded by the reduction in voltage across the battery. Where a battery charging dynamo is fitted, check that the mains battery charger is disconnected by the operation of the auxiliary contactor during the time the engine is running.

(10) Check instruments and gauges for normal operation and response and that the generator voltage is being maintained within the prescribed limits, making due allowance for no-load conditions. Compare the reading of the frequency meter with that of the engine tachometer, where both are fitted.

(11) Stop engine by turning selector switch to 'Off' position and verify that generator contactor opens as between 95% and 85% of normal voltage. Re-check water and oil levels.

(12) Turn selector switch to 'Auto' position. Disconnect the sensing circuit supply and check that the set starts, the mains contactor opens, and the generator contactor closes in correct order. Reconnect the sensing circuit to verify that the engine stops on restoration of the mains supply and that the contactors operate correctly. Check voltage sensing and time delays on each phase in turn and also that the push buttons for mains failure simulation and engine stopping operate correctly.

NOTE:

Running of the engine for any length of time under no-load conditions is undesirable and tests calling for such operation should be carried out in as short a time as possible consistent with thoroughness.

3.05 EXHAUST/SILENCER

An efficient residential exhaust/silencer with adequate draining facilities shall be mounted arranged that it may be readily re-located if required. It shall be designed to limit the noise at a maximum of 18 dB (*A*) to 25dB (A) measured at 7 meters from the generator room.

The exhaust shall be fixed 300mm below the ceiling, to discharge outside the buildings on the roof of the generator house.

The silencer and all exhaust pipes shall be fixed by the Contractor in a manner to be approved by the Engineer.

3.06 STARTING BATTERY AND CHARGER

An initially fully-charged battery shall be supplied and installed with each generator. The battery shall be supplied fixed on a suitable frame, to the approval of the Engineer.

The battery shall be either 4 No 12 or 2 No 24 volts 75AH and capable of withstanding the loads imposed upon it by its specified duties.

It shall be maintenance-free type and shall be of sufficient capacity for four starts in succession once in an eight-hour-period.

Auxiliary circuits connected to the battery shall be protected by fuses.

3.07 IMPORTANT INFORMATION TO THE TENDERER

The tenderer shall attach a properly signed letter to his tender documents, stating:

1) The country of origin of the equipment he is offering.

2) The availability of spare parts locally.

3) The cost of maintaining the whole set per annum
   (a) Excluding the cost of spare parts.
   (b) Including the cost of spare parts.

4) Mode of payment proposed.

The tenderer shall in addition attach brochures of his equipment, to the tender documents.

NB: The tenderer should note that the cost of maintaining the set mentioned in Item No.3 above, refers to the period after the first year. Maintenance for the first twelve months including all spare parts and consumables, to be carried out free of charge by the tenderer who should take this into account when tendering.

The tenderer must provide specs sheets (cut sheets) for all the items he proposes to supply

3.08 FUNCTIONAL REQUIREMENTS

As specified herein, the generator set shall be used for standby operation. It shall also be possible to start, operate and stop the generator set manually independent of any automatic features.

Within the operating conditions specified, the generator set shall be capable of starting and accepting full load within the shortest possible time and in any case in not more than 10 seconds.

The contractor shall note that the fault level of the overall system shall be limited such that the ratings of switchgear and all associated components are not exceeded.

The contractor shall ensure that the protection systems and equipment are fully integrated and graded to ensure discrimination is provided throughout the standby generation system and power distribution installation, inclusive of the main switchboard and all other sub boards and distribution boards.

Operation of the standby generator system shall be as follows:

A. Main incoming Supply Failure with Subsequent Automatic Generator Start

(i) Loss of voltage on bus bars of main incoming sections of new main switchboard detected.

(ii) Auto changeover contactors activated after nominal time delay (adjustable) and change over to generator position.

(iii) Signal given de activating power factor correction equipment (if any) within the main switchboard.

(iv) When it has attained correct voltage and speed, the set closes its respective circuit breaker onto the control panel bus bars.

B. Restoration from Incoming Supply Failure

(i) Normal healthy mains detected on main incoming sections of main switchboard.

(ii) After a suitable time delay (adjustable) auto-change over contactors operated and change over to mains supply position.

(iii) Signal given to reinstate power factor correction equipment.

(iv) Generator Output Circuit Breaker opens.

(v) Generator shall run on for a period of time (adjustable) off-loaded its respective circuit breakers opened and then shut down.

C. Test running of Generators

Facilities shall be incorporated to permit the generator to be manually started and test run both off and on load.

Reinstatement from test running shall be achieved in a similar manner as previously outlined for restoration from mains supply.

The contractor shall note that the above description as previously stated, gives a summary of the anticipated generator and control operation for automatic mains failure and test running conditions, to give an outline indication of the design intent and operation required. Full details of the total generator control system operation and the contractor shall submit functional procedures at the time of submission of detailed working drawing information.

3.10 EARTHING SYSTEMS

The contractor shall provide and install the main earthing system for the standby generation system as summarized below.

Before commencement of any work in connection with the main earthing system, the contractor shall carry out a detailed examination of the existing earthing systems and all associated connections and components, together with carrying out all necessary tests to verify the impedances of the existing earthing systems.

The results of these tests and inspection shall be fully detailed with any defects recorded in detail.

The contractor shall include within his tender for testing of the incoming supply earthing to be carried out together with any associated remedial work found to be necessary with the incoming supply earth.

Where required, the systems shall comprise earth electrodes, earth copper conductors, protective conductors comprising copper bar, tape and cables, together with bonding of equipment, ladder racking, conduit, trunking, cable tray and all exposed metal work etc.

The contractor shall carry out earth resistivity tests to determine ground conditions prior to commencement of the main earthing system.

The groups of rods shall be bonded by a solid 100mmx100mm copper PVC wrapped from a centre electrode, copper stranded PVC insulated earth conductors shall be bonded by means of purpose made lugs to the main earthing terminal, situated within the switch room and standby generator room, all to Kenya Power & Lighting Company's requirement/ approval.

The terminals shall comprise exposed hard drawn copper bar installed at low level and supported on heavy duty impact resistant insulators.

Purpose made test links shall be provided for each main earthing terminal to facilitate disconnection from the earthing for testing purposes earth electrodes and interconnections between terminals.

3.11 PERFORMANCE

The. Generator set shall be rated 250 KVA at 3 x 415Volts 3-phase 4-wire, 50 Hertz AC. It should be capable of operating at rated output in ambient conditions of 5° C to 40° C and up to 100% relative humidity in a naturally ventilated building. External noise level shall not exceed NR40 at a distance of 15 meters from the generator, with the generator running at full load.

Within the operating conditions specified, the generator sets with its standard air intake filters, should be capable of delivering its rated output continuously at rated voltage and 0.8 lagging power factor, and of delivering 10% in excess of the continuous maximum rating for a period of one hour in any 12 hour period.

The steady state voltage should be maintained within $2^1/2\%$ of rated voltage under control of the voltage regulator, between cold start ambient conditions and maximum working temperatures, at any load from no load to 10% overload and from unity to 0.8 lagging power factor. After any change in load, the voltage shall not vary by more than +15% of the rated voltage and shall return to within ±3% within 3 seconds and to within $2^1/2\%$ of rated voltage within 15 seconds. On starting, the voltage overshoot shall not exceed 15% and shall return to within 3% in not more than 3 seconds.

The set shall be mounted on a heavy steel base suitable for anchoring onto the floor. The generator set shall be mounted on robust anti-vibration and shock absorbing devices, fitted with adjusting screws for optimum setting and levelling.

The engine shall be 6 cylinders, 4 cycles, capable of delivering the maximum horsepower required by the alternator at a governed speed of 1500 rpm.

The engine shall be designed for operation on fuel oil, complying with BS 2869:2010+A1:2011.

The engine and alternator must be torsional compatible. No significant critical speed on the complete shaft system, including the alternator, shall be within 15% of the rated speed.

The engine shall be equipped with a speed governor, which shall be self-lubricated, adjustable, hydraulic type. The speed governor shall maintain the speed within 5% from no-load to full load.

A m nual reset over speed trip shall be fitted to stop the engine if its speed exceeds the rated speed by 15%. If a mechanized or belt driven trip is fitted, at least two belts shall be provided and the device shall be capable of carrying full load with one belt removed.

3.12 SET ARRANGEMENT

The set shall be mounted on a heavy steel base suitable for anchoring onto the floor. The generator set shall be mounted on robust anti-vibration and shock absorbing devices fitted with adjusting screws for optimum setting and levelling.

The set shall be enclosed in a fully weatherproof and soundproof canopy. The enclosure must reduce sound levels to comply with EU regulations 2000/14/EC. External noise shall not exceed NR40 at a distance of 15 meters from the generator, with the generator running at full load.

COUNTY GOVERNMENT OF BOMET

P.O BOX 19-20400 BOMET

THE PROPOSED CONSTRUCTION OF DR. JOYCE LABOSO MOTHER AND CHILD WELLNESS CENTRE

TENDER DOCUMENT AND BILLS OF QUANTITIES

BILLS OF QUANTITIES

PROJECT MANAGER
DIRECTOR OF PUBLIC WORKS- BOMET COUNTY

QUANTITY SURVEYORS
COUNTY QUANTITY SURVEYOR- BOMET COUNTY

ARCHITECTS
COUNTY ARCHITECT- BOMET COUNTY.

MECHANICAL ENGINEER
COUNTY MECHANICAL SERVICES ENGINEERS

ELECTRICAL ENGINEER
COUNTY ELECTRICAL SERVICES ENGINEERS

STRUCTURAL ENGEERER
COUNTY STRUCTURAL ENGINEER- BOMET COUNTY.

JULY, 2021

SECTION 1-A

PRELIMINARIES

Item	Description		Amount KShs.
	PARTICULAR PRELIMINARIES		
A	**PRICING ITEMS OF PRELIMINARIES** Prices **SHALL BE INSERTED** against items of "preliminaries" in the tenderer's priced Bills of Quantities. The contractor is advised to read and understand all preliminary items.		
B	**DESCRIPTION OF THE WORKS** The works to be carried out under this contract is the construction of Bomet MOTHER AND CHILD WELLNESS CENTRE, Bomet County.		
C	**MEASUREMENTS** In the event of any discrepancies arising between the Bills of Quantities and the actual works, the site measurements shall generally take precedence. However, such discrepancies between any contract documents shall immediately be referred to the PROJECT MANAGER in accordance with Clause 22 of the Conditions of Contract. The discrepancies shall then be treated as a variation and be dealt with in accordance with Clause 22 of the said Conditions.		
D	**LOCATION OF SITE** The site of the proposed works is at Bomet County. The Contractor is advised to visit the site, to familiarize with the nature and position of the site. No claims arising from the Contractor's failure to do so will be entertained.		
E	**SIGNING OF THE TENDER DOCUMENTS** The bidder shall append his / her signature and / or company 's rubberstamp on each and every page of tender document.		
F	**DEMOLITIONS AND ALTERATIONS** The Contractor is to allow for all temporary protection required during the works including ordinary and special dust screens, hoardings, barriers, warning signs, etc as directed by the Project Manager and as necessary for the adequate propping and protection of existing property, finishes, workmen employed on the site, employer's agents and the public. Any damage or loss incurred due to the insufficiency of such protection must be made good by the Contractor. All protective devices are to be removed on completion of the works and any necessary making good consequent upon this is to be excecuted to the satisfaction of the Project Manager.		
	The works shall be propped, strutted and supported as necessary before any alteration or demolition work commences. Prices shall include for all cleaning and preparatory work to structure and finishes and for making good to all finishes on completion whether or not specifically described.		
	Unless described as set aside for re-use all arising debris and surplus materials shall be carefully removed from building and carterd away from site. The Contractor shall be entirely responsible for any breakage or damage which may occur to materials required for re-use during their removal unless it is certified by the Project Manager that such damage or breakage was inevitable as a result of the condition of the item concerned.		
	Carried to collection		

Item	Description		Amount KShs.
A	**CLEARING AWAY** The Contractor shall remove all temporary works, rubbish, debris and surplus materials from the site as they accumulate and upon completion of the works, remove and clear away all plant, equipment, rubbish, unused materials and stains and leave in a clean and tidy state to the reasonable satisfaction of the Project Manager. The whole of the works shall be delivered up clean, complete and in perfect condition in every respect to the satisfaction of the Project Manager.		
B	**CLAIMS** It shall be a condition of this contract that upon it becoming reasonably apparent to the Contractor that he has incurred losses and / or expenses due to any of the contract conditions, or by any other reason whatsoever, he shall present such a 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 contact period.		
C	**PAYMENTS** The tenderer's attention is drawn to the fact that the GOVERNMENT DOES NOT MAKE ADVANCE PAYMENTS but pays for work done and materials delivered to sit: all in accordance with Clause 23 of the Conditions of Contract Agreement. In order to facilitate this, a list of the general component elements for the works is given at the summary page of these specifications and the tenderer is requested to break down his tender sum commensurate to the said elements		
D	**PREVENTION OF ACCIDENT, DAMAGE OR LOSS** The Contractor is notified that these works are to be carried out on a restricted site where the client is going on with other nomal activities. The Contractor is thus instructed to take reasonable care in the execution of the works as to prevent accidents, damage or loss and disruoption of activities beeing carried out by the Client. The Contractor shall allow in his rates any expense he deemed necessary by taking such care within the site		
E	**WORKING CONDITIONS** The Contractor shall allow in his rates for any interferance that he may encounter in the course of the works for the Client may in some cases ask the Contractor not to proceed with the works until some activities within the site are completed, as the facility will be operating as usual during the course of the contract.		
F	**SIGNBOARD** Allow for providing, erecting, maintaining throughout the course of the Contract and afterwards clearing away a signboard as designed, specified and approved by the Project Manager.		
G	**LABOUR CAMPS** The Contractor shall not be allowed to house labour on site. Allow for transporting workers to and from the site during the tenure of the contract.		
H	**MATERIALS FROM DEMOLITIONS** Any materials arising from demolitions and not re-used shall become the property of the Client		
	Carried to collection		

Item	Description		Amount KShs.
A	**PRICING RATES** The tenderer shall include for all costs in executing the whole of the works, including transport, replacing damaged items, fixing, all to comply with the said Conditions of Contract.		
B	**URGENCY OF THE WORKS** The Contractor is notified that these " works are urgent" and should be completed within the period stated in these Particular Preliminaries. The Contractor shall allow in his rates for any costs he/ she deems that he/she may incur by having to complete these works within the stipulated contract period.		
C	**PAYMENT FOR MATERIALS ON SITE** All materials for incorporation in the works must be stored on site before payment is effected, unless specifically exempted by the Project Manager. This is to include materials of the Contractor, nominated sub-Contractors and nominated suppliers.		
D	**EXISTING SERVICES** Prior to the commencement of any work, the Contractor is to ascertain from the relevant authority the exact position, depth and level of all existing services in the area and he/she shall make whatever provisions may be required by the authorities concerned for the support, maintenance and protection of such services.		
E	**CONTRACT COMPLETION PERIOD** The contract completion period in accordance with condition 31 of the Conditions of contract must be adhered to. The 'PROJECT MANAGER' shall strictly monitor the Contractors progress in relation to the progress chart and should it be found necessary the 'PROJECT MANAGER' shall inform the Contractor in writing that his actual performance on site is not satisfactory .In all such cases the Contractor shall accelerate his rate of performance production and progress by all means such as additional labour,plant, e.t.c and working overtime all at his cost.		
F	**BID SECURITY** The tenderer shall provide a Bid Security equivalent to 2% in accordance with clause 3.7 of the Instructions to Tenderer's.		
G	**TENDER DOCUMENTS** Tender documents are as listed in Clause 2.1 of the Instruction to Tenderer's Page STD/9		
H	**DELIVERY OF TENDER** Tenders and all documents in connection therewith, as specified above must be delivered in the addressed envelope which should be properly sealed and deposited at the offices as specified in the letter accompanying these documents or as indicated in the advertisement. Tenders will be opened at the time specified in the letter accompanying these Tender Documents or as indicated in the advertisement. Tenders delivered/received later than the above time will not be opened.		
	Carried to collection		

Item	Description		Amount KShs.
A	**VALUE ADDED TAX** 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 SHOULD THEREFORE INCLUDE ALLOWANCE IN HIS RATES AND PRICES FOR VAT AND ANY OTHER GOVERNMENT TAXES CURRENTLY IN FORCE**.		
B	**PROJECT MANAGERS EXPENSES** Provide a provisional sum of Kenya Shillings Two Million (Kshs 2,000,000.00) only for the Project Management contigency amount for facilitation of various site and offsite Tests Site visits / inspections etc.		
C	Allow for Contractor's profit and overheads (--------%)		
C	contractor shall provide the following immediately after signing th contract; 1). 2 Nr Laptop as Asus Zenbook UX481F Core i7 10th Gen 16gb/1TB/2Gb/Win10/14 Or equally approved. 2). coloured printer with capacity to print upto 60papers/minute and upto A3 coloured Papers as "RICOH AFICIO MP C6003 PHOTOCOPIER" or equally approved. 3). Allow for Attendance, profits and overheads on the above stated 2 items		
	Carried to collection		

Item	Description		Amount KShs.
A	**PARTICULARS OF INSERTIONS TO BE MADE IN APPENDIX TO CONTRACT AGREEMENT** The following are the insertions to be made in the appendix to the Contract Agreement: - **Period of Final Measurement** **3** Months From Practical completion **Defects Liability Period** **6** Months from Practical completion **Date for Possession** To be agreed with the Project Manager **Date for Completion** **160** Weeks from date of Possession **Prime cost** sums for which ..... The Contractor desires to tender ..... **Period of Interim Certificates** **Q**uarterly **Period of Honouring Certificates** 30 days **Percentage of Certified Value Retained** 10% **Limit of Retention Fund** 5% ***Carried to collection*** **COLLECTION** Brought forward from page PP/1 Brought forward from page PP/2 Brought forward from page PP/3 Brought forward from page PP/4 Brought forward from above		
	TOTAL FOR PARTICULAR PRELIMINARIES CARRIED TO GRAND		

Item	Description		Amount KShs
	GENERAL PRELIMINARIES		
A	**PRICING ITEMS OF PRELIMINARIES AND PREAMBLES**		
	Prices will be inserted against items of Preliminaries in the Contractor's priced Bills of Quantities and Specification.		
	The Contractor shall be deemed to have included in his prices or rates for the various items in the Bills of Quantities or Specification for all costs involved in complying with all the requirements for the proper execution of the whole of the works in the Contract.		
B	**ABBREVIATIONS**		
	Throughout these Bills, units of measurement and terms are abbreviated and shall be all the requirements for the proper execution of the whole of the works in the Contract.		
	C.M/ M3.	Shall mean cubic metre	
	S.M/M2.	Shall mean square metre	
	L.M.	Shall mean linear metre	
	MM	Shall mean Millimetre	
	Kg.	Shall mean Kilogramme	
	No.	Shall mean Number	
	Prs.	Shall mean Pairs	
	B.S. - Shall mean the British Standard Specification Published by the British Standards Institution, 2 Park Street, London W.I., England.		
	Ditto - Shall mean the whole of the preceding description except as qualified in the description in which it occurs.		
	m.s.	Shall mean measured separately.	
	a.b.d	Shall mean as before described.	
	Carried to collection		

Item	Description		Amount KShs
A	**EXCEPTION TO THE STANDARD METHOD OF MEASUREMENT** *Attendance ;* Clause B19(a) of the Standard Method of Measurement is deleted and the following clause is substituted:- Attendance on nominated Sub-Contractors shall be given as an item in each case shall be deemed to include: allowing use of standing scaffolding, mess rooms, sanitary accommodation and welfare facilities; provision of special scaffolding where necessary; providing space for office accommodation and for storage of plant and materials; providing light and water for their work: clearing away rubbish; unloading checking and hoisting: providing electric power and removing and replacing duct covers, pipe casings and the like necessary for the execution and testing of Sub- Contractors' work and being responsible for the accuracy of the same *Fix Only:-* "Fix Only" shall mean take delivery at nearest railway station (Unless otherwise stated),pay all demurrage charges, load and transport to site where necessary, unload, store,unpack, assemble as necessary, distribute to position, hoist and fix only.		
B	**EMPLOYER** The "Employer" is County Government of Bomet. The term "Employer" and "county government of Bomet" wherever used in the contract document shall be synonymous		
C	**PROJECT MANAGER** The term "P.M." wherever used in these Bills of Quantities shall be deemed to imply the Project Manager as defined in Condition 1 of the Conditions of Contract or such person or persons as may be duly authorised to represent him on behalf of the Government.		
D	**ARCHITECT** The term "Architect" shall be deemed to mean "The P.M." as defined above whose address unless otherwise notified is Ministry of Roads ,Public Works and Transport, P.O. Box 19-20400 BOMET		
E	**QUANTITY SURVEYOR** The term "Quantity Surveyor" shall be deemed to mean "The P.M." as defined above whose address unless otherwise notified is Ministry of Land, Housing and Urban Development, P.O. Box 19-20400, BOMET		
F	**ELECTRICAL ENGINEER** The term "Electrical Engineer" shall be deemed to mean "The P.M." as defined above whose address unless otherwise notified is Ministry of Land, Housing and Urban Development, P.O. Box 19-20400, BOMET		
G	**MECHANICAL ENGINEER** The term "Mechanical Engineer" shall be deemed to mean "The P.M." as defined above whose address unless otherwise notified is Ministry of Land, Housing and Urban Development, P.O. Box 19-20400, BOMET		
	Carried to collection		

Item	Description		Amount KShs.
A	**STRUCTURAL ENGINEER** The term "Structural Engineer" shall be deemed to mean "The P.M." as defined above whose address unless otherwise notified is Ministry of Land, Housing and Urban Development, P.O. Box 19-20400, BOMET		
B	**FORM OF CONTRACT** The Form of Contract shall be as stipulated in the Republic of Kenya's Standard Tender Document for Procurement of Building Works(Revised 2006 Edition) included herein The Conditions of Contract are also included herein *Conditions of Contract* These are numbered from 1 to 37 as set out in pages 22 *to 42* of these tender documents. Particulars of insertions to be made in the Appendix to the Contract Agreement will be found in the Particular Preliminaries part of these Bills of Quantities		
C	**PERFORMANCE BOND.** The Contractor shall find and submit on the Form of Tender an approved bank who will be willing to be bound to the Government in an amount equal to five per cent (5) of the Contract amount for the due performances of the Contract up to the date of completion as certified by the PROJECT MANAGER and who will, when and if called upon, sign a Bond to that effect on the relevant standard form included herein. (without the addition of any limitations) on the same day as the Contract Agreement is signed, by the Government, the Contractor shall furnish within seven days another Surety to the approval of the Government.		
D	**PLANT, TOOLS AND VEHICLES** Allow for providing all scaffolding, plant, tools and vehicles required for the works except in so far as may be stated otherwise herein and except for such items specificallyand only required for the use of nominated Sub-Contractors as described herein. No timber used for scaffolding, formwork or temporary works of any kind shall be used afterwards in the permanent work.		
E	**TRANSPORT.** Allow for transport of workmen, materials, etc., to and from the site at such hours and by such routes as may be permitted by the competent authorities.		
F	**MATERIALS AND WORKMANSHIP.** All materials and workmanship used in the execution of the work shall be of the best quality and description unless otherwise stated. The Contractor shall order all materials to be obtained from overseas immediately after the Contract is signed and shall also ensure they are onsite when required for use in the works. The Bills of Quantities shall not be used for the purpose of ordering materials.		
	Carried to collection		

Item	Description		Amount KShs.
A	**SIGN FOR MATERIALS SUPPLIED.** The Contractor will be required to sign a receipt for all articles and materials supplied by the PROJECT MANAGER at the time of taking deliver thereof, as having received them in good order and condition, and will thereafter be responsible for any loss or damage and for replacements of any such loss or damage with articles and/or materials which will be supplied by the PROJECT MANAGER at the current market prices including Customs Duty and V.A.T., all at the Contractor's own cost and expense, to the satisfaction of the PROJECT MANAGER		
B	**STORAGE OF MATERIALS** The Contractor shall provide at his own risk and cost where directed on the site weather proof lock-up sheds and make good damaged or disturbed surfaces upon completion to the satisfaction of the PROJECT MANAGER Nominated Sub-Contractors are to be made liable for the cost of any storage accommodation provided especially for their use.		
C	**SAMPLES** The Contractor shall furnish at his own cost any samples of materials or workmanship including concrete test cubes required for the works that may be called for by the PROJECT MANAGER for his approval until such samples are approved by the PROJECT MANAGER and the PROJECT MANAGER, may reject any materials or workmanship not in his opinion to be up to approved samples. The PROJECT MANAGER shall arrange for the testing of such materials as he may at his discretion deem desirable, but the testing shall be made at the expense of the Contractor and not at the expense of the PROJECT MANAGER. The Contractor shall pay for the testing in accordance with the current scale of testing charges laid down by the Ministry of Land, Housing and Urban Development The procedure for submitting samples of materials for testing and the method of marking for identification shall be as laid down by the PROJECT MANAGER The Contractor shall allow in his tender for such samples and tests except those in connection with nominated sub-contractors' work.		
D	**GOVERNMENT ACTS REGARDING WORKPEOPLE ETC.** Allow for complying with all Government Acts, Orders and Regulations in connection with the employment of Labour and other matters related to the execution of the works. In particular the Contractor's attention is drawn to the provisions of the Factory Act 1950 and his tender must include for all costs arising or resulting from compliance with any Act, Order or Regulation relating to Insurances, pensions and holidays for workpeople or so the safety, health and welfare of the workpeople. The Contractor must make himself fully acquainted with current Acts and Regulations, including Police Regulations regarding the movement, housing, security and control of labour, labour camps , passes for transport, etc. It is most important that the Contractor, before tendering, shall obtain from the relevant Authority the fullest information regarding all such regulations and/or restrictions which may affect the organisation of the works, supply and control of labour, etc., and allow accordingly in his tender. No claim in respect of want of knowledge in this connection will be entertained.		
	Carried to collection		

PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

Item	Description		Amount KShs.
A	**SECURITY OF WORKS ETC.** The Contractor shall be entirely responsible for the security of all the works stores, materials, plant, personnel, etc., both his own and sub-contractors' and must provide all necessary watching, lighting and other precautions as necessary to ensure security against theft, loss or damage and the protection of the public.		
B	**PUBLIC AND PRIVATE ROADS.** Maintain as required throughout the execution of the works and make good any damage to public or private roads arising from or consequent upon the execution of the works to the satisfaction of the local and other competent authority and the PROJECT MANAGER		
C	**EXISTING PROPERTY.** The Contractor shall take every precaution to avoid damage to all existing property including roads, cables, drains and other services and he will be held responsible for and shall make good all such damage arising from the execution of this contract at his own expense to the satisfaction of the PROJECT MANAGER		
D	**VISIT SITE AND EXAMINE DRAWINGS.** The Contractor is recommended to examine the drawings and visit the site the location of which is described in the Particular Preliminaries hereof. He shall be deemed to have acquainted himself therewith as to its nature, position, means of access or any other matter which, may affect his tender. No claim arising from his failure to comply with this recommendation will be considered.		
E	**ACCESS TO SITE AND TEMPORARY ROADS.** Means of access to the Site shall be agreed with the PROJECT MANAGER prior to commencement of the work and Contractor must allow for building any necessary temporary access roads for the transport of the materials, plant and workmen as may be required for the complete execution of the works including the provision of temporary culverts, crossings, bridges, or any other means of gaining access to the Site. Upon completion of the works, the Contractor shall remove such temporary access roads; temporary culverts, bridges, etc., and make good and reinstate all works and surfaces disturbed to the satisfaction of the PROJECT MANAGER The Contractor should also allow for relocating existing fence (approx. 30 metres long)		
F	**AREA TO BE OCCUPIED BY THE CONTRACTOR** The area of the site which may be occupied by the Contractor for use of storage and for the purpose of erecting workshops, etc., shall be defined on site by the PROJECT MANAGER		
	Carried to collection		

PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

Item	Description		Amount KShs.
A	**OFFICE ETC. FOR THE PROJECT MANAGER** The Contractor shall provide, erect and maintain where directed on site and afterwards dismantle the site office of the standard type, complete with furniture. He shall also provide a strong metal trunk complete with strong hasp and staple fastening and two keys. He shall provide, erect and maintain a lock-up type water or bucket closet for the sole use of the PROJECT MANAGER including making temporary connections to the drain where applicable to the satisfaction of Government and Medical Officer of Health and shall provide services of cleaner and pay all conservancy charges and keep both office and closet in a clean and sanitary condition from commencement to the completion of the works and dismantle and make good disturbed surfaces. The office and closet shall be completed before the Contractor is permitted to commence the works. The Contractor shall make available on the Site as and when required by the "PROJECT MANAGER" a modern and accurate level together with levelling staff, ranging rods and 50 metre metallic or		
B	**WATER AND ELECTRICITY SUPPLY FOR THE WORKS** The Contractor shall provide at his own risk and cost all necessary water, electric light and power required for use in the works. The Contractor must make his own arrangements for connection to the nearest suitable water main and for metering the water used. He must also provide temporary tanks and meters as required at his own cost and clear away when no longer required and make good on completion to the entire satisfaction of the PROJECT MANAGER . The Contractor shall pay all charges in connection herewith. No guarantee is given or implied that sufficient water will be available from mains and the Contractor must make his own arrangements for augmenting this supply at his own cost. Nominated Sub--contractors are to be made liable for the cost of any water or electric current used and for any installation provided especially for their own use.		
C	**SANITATION OF THE WORKS** The Sanitation of the works shall be arranged and maintained by the Contractor to the satisfaction of the Government and/or Local Authorities, Labour Department and the PROJECT MANAGER. This will include Erection and maintainance of sanitary facilities on site as may be required.		
D	**SUPERVISION AND WORKING HOURS** The works shall be executed under the direction and to the entire satisfaction in all respects of the PROJECT MANAGER who shall at all times during normal working hours have access to the works and to the yards and workshops of the Contractor and sub-Contractors or other places where work is being prepared for the contract.		
E	**PROVISIONAL SUMS.**		
F	The term "Provisional Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A item A7(i) of the Standard Method of Measurement. Such sums are net and no addition shall be made to them for profit.		
	PRIME COST (OR P.C.) SUMS. The term "Prime Cost Sum" or "P.C. Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A item A7 (ii) of the Standard Method of Measurement. Persons or firms nominated by the PROJECT MANAGER to execute work or to provide and fix materials or goods are described herein as Nominated Sub- Contractors. Persons or firms so nominated to supply goods or materials are described herein as Nominated Suppliers.		
	Carried to collection		

PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

Item	Description		Amount KShs.
A	**PROGRESS CHART.** The Contractor shall provide within two weeks of Possession of Site and in agreement with the PROJECT MANAGER a Progress Chart for the whole of the works including the works of Nominated Sub-Contractors ; one copy to be handed to the PROJECT MANAGER and a further copy to be retained on Site. Progress to be recorded and chart to be amended as necessary as the work proceeds.		
B	**ADJUSTMENT OF P.C. SUMS.** 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" Should the Contractor be permitted to tender and his tender be accepted of any work for which a P.C. Sum is included in these Bill of Quantities profit and attendance will be allowed at the same rate as it would be if the work were executed by a Nominated Sub-Contractor.		
D	**ADJUSTMENT OF PROVISIONAL SUMS.** In the final account all Provisional Sums shall be deducted and the value of the work properly executed in respect of them upon the PROJECT MANAGER's order added to the Contract Sum. Such work shall be valued as described for Variations, but should any part of the work be executed by a Nominated Sub-Contractor, the value of such work or articles for the work to be supplied by a Nominated Supplier, the value of such work or articles shall be treated as a P.C. Sum and profit and attendance comparable to that contained in the priced Bills of Quantities for similar items added		
E	**NOMINATED SUB-CONTRACTORS** When any work is ordered by the PROJECT MANAGER to be executed by nominated sub-contractors, the Contractor shall enter into sub-contracts and shall thereafter be responsible for such sub-contractors in every respect. Unless otherwise described the Contractor is to provide for such Sub-Contractors any or all of the facilities described in these Preliminaries. The Contractor should price for these with the nominated Sub- contract Contractor's work concerned in the P.C. Sums under the description "add for Attendance"		
F	**DIRECT CONTRACTS** Notwithstanding the foregoing conditions, the Government reserves the right to place a "Direct Contract" for any goods or services required in the works which are covered by a P.C. Sum in the Bills of Quantities and to pay for the same direct. In any such instances, profit relative to the P.C. Sum the priced Bills of Quantities will be adjusted as described for P.C. Sums and allowed.		
	Carried to collection		

PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

Item	Description		Amount KShs.
A	**ATTENDANCE UPON OTHER TRADESMEN, ETC.** The Contractor shall allow for the attendance of trade upon trade and shall afford any tradesmen or other persons employed for the execution of any work not included in this Contract every facility for carrying out their work and also for use of his ordinary scaffolding. The Contractor, however, shall not be required to erect any special scaffolding for them. The Contractor shall perform such cutting away for and making good after the work of such tradesmen or persons as may be ordered by the PROJECT MANAGER and the work will be measured and paid for to the extent executed at rates provided in these Bills.		
B	**INSURANCE** The Contractor shall insure as required in Clause 30 of the Conditions of Contract. No payment on account of the work executed will be made to the Contractor until he has satisfied the PROJECT MANAGER either by production of an Insurance Policy or and Insurance Certificate that the provision of the foregoing Insurance Clauses have been complied with in all respects. Thereafter the PROJECT MANAGER shall from time to time ascertain that premiums are duly paid up by the Contractor who shall if called upon to do so, produce the receipted premium renewals for the PROJECT MANAGER's inspection		
C	**PROVISIONAL WORK** All work described as "Provisional" in these Bills of Quantities is subject to remeasurement in order to ascertain the actual quantity executed for which payment will be made. All "Provisional" and other work liable to adjustment under this Contract shall left uncovered for a reasonable time to allow all measurements needed for such adjustment to be taken by the PROJECT MANAGER Immediately the work is ready for measuring, the Contractor shall give notice to the PROJECT MANAGER. If the Contractor makes default in these respects he shall if the PROJECT MANAGER so directs uncover the work to enable all measurements to be taken and afterwards reinstate at his own expense.		
D	**ALTERATIONS TO BILLS, PRICING, ETC.** Any unauthorised alteration or qualification made to the text of the Bills of Quantities may cause the Tender to be disqualified and will in any case be ignored. The Contractor shall be deemed to have made allowance in his prices generally to cover any items against which no price has been inserted in the priced Bills of Quantities. All items of measured work shall be priced in detail and the Tenders containing Lump Sums to cover trades or groups of work must be broken down to show the price of each item before they will be accepted		
E	**BLASTING OPERATIONS** Blasting will only be allowed with the express permission of the PROJECT MANAGER in writing. All blasting operations shall be carried out at the Contractor's sole risk and cost in accordance with any Government regulations in force for the time being, and any special regulations laid down by the PROJECT MANAGER governing the use and storage of explosives		
	Carried to collection		

PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

Item	Description		Amount KShs.
A	**MATERIALS ARISING FROM EXCAVATIONS** Materials of any kind obtained from the excavations shall be the property of the Government. Unless the PROJECT MANAGER directs otherwise such materials shall be dealt with as provided in the Contract. Such materials shall only be used in the works, in substitution of materials which the Contractor would otherwise have had to supply with the written permission of the PROJECT MANAGER Should such permission be given, the Contractor shall make due allowance for the value of the materials so used at a price to be agreed.		
B	**PROTECTION OF THE WORKS.** Provide protection of the whole of the works contained in the Bills of Quantities, including casing , casing up, covering or such other means as may be necessary to avoid damage to the satisfaction of the PROJECT MANAGER and remove such protection when no longer required and make good any damage which may nevertheless have been done at completion free of cost to the Government.		
C	**REMOVAL OF RUBBISH ETC.** 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.		
D	**WORKS TO BE DELIVERED UP CLEAN** Clean and flush all gutters, rainwater and waste pipes, manholes and drains, wash (except where such treatment might cause damage) and clean all floors, sanitary fittings, glass inside and outside and any other parts of the works and remove all marks, blemishes, stains and defects from joinery, fittings and decorated surfaces generally, polish door furniture and bright parts of metalwork and leave the whole of the buildings watertight, clean, perfect and fit for occupation to the approval of the PROJECT MANAGER		
E	**GENERAL SPECIFICATION.** For the full description of materials and workmanship, method of execution of the work and notes for pricing, the Contractor is referred to the Ministry of Roads, Public Works and Housing General Specification dated 1976 or any subsequent revision thereof which is issued as a separate document, and which shall be allowed in all respects unless it conflicts with the General Preliminaries, Trade Preambles or other items in these Bills of Quantities.		
F	**TRAINING LEVY** The Contractor's attention is drawn to legal notice No. 237 of October, 1971, which requires payment by the Contractor of a Training Levy at the rate of 1/4 % of the Contract sum on all contracts of more than Kshs. 50.000.00 in value.		
G	**MATERIALS ON SITE** All materials for incorporation in the works must be stored on or adjacent to the site before payment is effected unless specifically exempted by the PROJECT MANAGER. This includes the materials of the Main Contractor, Nominated Sub-Contractors and Nominated Suppliers.		
	Carried to collection		

PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

Item	Description		Amount KShs.
A	**HOARDING** The Contractor shall enclose all the areas under construction with approved material (iron sheets)to the satisfaction of the PROJECT MANAGER		
B	**CONTRACTOR'S SUPERINTENDENCE/SITE AGENT** The Contractor shall constantly keep on the works a literate English speaking Agent or Representative, competent and experienced in the kind of work involved who shall give his whole experience in the kind of work involved and shall give his whole time to the superintendence of the works. Such Agent or Representative shall receive on behalf of the Contractor all directions and instructions from the Project Manager and such directions shall be deemed to have been given to the Contractor in accordance with the Conditions of Contract		
	National Authority Act The Contractor shall pay national construction Aauthority act 0.5 % of total contract cost.		
	Carried to collection		
	COLLECTION Brought Forward From Page GP/ 1 Brought Forward From Page GP/ 2 Brought Forward From Page GP/ 3 Brought Forward From Page GP/ 4 Brought Forward From Page GP/ 5 Brought Forward From Page GP/ 6 Brought Forward From Page GP/ 7 Brought Forward From Page GP/ 8 Brought Forward From Page GP/ 9 Brought Forward From Above		
	TOTAL FOR GENERAL PRELIMINARIES CARRIED TO GRAND SUMMARY		

SECTION 1

MAIN BUILDING

	SUB-STRUCTURE				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	EXCAVATING AND FILLING				
	Site preparation				
	Clearing site vegetation; filling voids left by removal of roots with selected material arising from excavation				
A	bushes, scrub, undergrowth, hedges, trees and tree stumps not exceeding 600 girth; **Setting aside Cut Trees For Re-Use.**	1425	m2		
	Excavating				
	To reduce levels				
B	maximum depth not exceeding 0.25 m	428	m3		
	Pits; (....nr)				
C	maximum depth not exceeding 1.50 m; commencing from reduced level	476	m3		
D	Depth 1.5-3m	159	m3		
	Trenches width not exceeding 600mm				
E	maximum depth not exceeding 1.00 m; commencing from reduced level	190	m3		
F	Depth 1.5-3m	64	m3		
	Disposal				
	Disposal of excavated material				
G	depositing on site in permanent spoil heaps average *m distant	532	m3		
	Selected excavated material obtained from on site spoil heaps				
	Filling to excavation				
H	average thickness not exceeding 0.25m	357	m3		
	Carried to Summary				

SUB-STR/1/ / /1

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	Hardcore to be obtained off site				
	Filling to excavation				
A	average thickness not exceeding 0.3m	1425	m2		
	Marrum to be obtained off site				
	Filling to excavation; depositing in layers 100mm maximum thickness				
B	average thickness not exceeding 50mm	1425	m2		
	Surface Treatments				
C	Applying Anti-termite solutions as "TERMIDOR" or equally approved	1425	m2		
	Carried to Summary				
	Collection From SUB-STR/1//1 SUB-STR/1//2				
	GROUNDWORK Carried to Summary				

SUB-STR/1/ / /2

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	REINFORCED CONCRETE				
	Plain in-situ concrete; mix 1:8 all in aggregate				
	Foundations				
A	generally	254	m2		
	Column Bases				
B	generally	318	m2		
	Reinforced in-situ concrete; B.S.5328 designed mix C30 20 aggregate minimum cement content 290 kg/m3; vibrated				
	Slabs				
C	thickness not exceeding 150	1425	m2		
D	Foundations Ground Beams generally	154	m3		
	Column Bases				
E	generally	112	m3		
	Columns				
F	generally	22	m3		
	FORMWORK FOR IN SITU CONCRETE				
	Formwork in Marine boards				
	Sides of Ground Beams and foundations				
G	height 225 -300	844	m		
	Sides of Slab				
H	height 225 -300	341	m		
	Sides of Column bases				
I	height 225 -300	834	m		
	Columns; isolated				
J	regular shaped; rectangular; ?nr	592	m2		
	Columns; isolated				
K	regular shaped; Circularr; ?nr	5	m2		
	Carried to Summary				
	SUB-STR/1/ / /1				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	REINFORCEMENT FOR IN-SITU CONCRETE				
	Reinforcement bars; B.S.4449 hot rolled deformed high yield steel				
	Bent				
A	Asorted	46,725.00	kgs		
	Reinforcement fabric				
	Reference A142 2.22 kg/m2; 250 side laps; 250 end laps				
D	generally	1425	m2		
	Carried to Summary				
	Collection From				
	SUB-STR/1//1				
	Above				
	IN - SITU CONCRETE Carried to Summary				

SUB-STR/1/ / /2

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	MASONRY				
	BRICK/BLOCK WALLING				
	Quarry Stones standard blocks; Aprox. 440 x 215 fron Lulunga or equally approved with 7N/mm2 Crushing strength and less than 15% Water absortion Rate Bedded in cement-Sand mortar (1:3)				
	Sub-Walls				
A	200mm thick	1232	m2		
	MASONRY Carried to Summary				

SUB-STR/1/ / /1

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	WATEROROOFING				
	FLEXIBLE SHEET TANKING/DAMP PROOF MEMBRANES				
	1000g Polythene Sheet; as Specification J40.120				
	Tanking and damp proofing				
A	flat	1,425.00	m2		
	WATERPROOFING Carried to Summary				

SUB-STR/1/ / /1

					Total Ksh
	SUMMARY **Collection from:-** GROUNDWORK IN - SITU CONCRETE MASONRY WATERPROOFING				
	To Final Summary				

PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

GROUND FLOOR

PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	IN - SITU CONCRETE				
	Reinforced in-situ concrete; B.S.5328 designed mix C30 20 aggregate minimum cement content 290 kg/m3; vibrated				
	Slabs				
A	thickness not exceeding 150	314	m3		
	Beams				
B	attached deep; greater than 5% reinforcement	92	m3		
	Columns				
C	generally	53	m3		
	Staircases				
D	generally	33	m3		
	RAMP				
E	generally	5	m3		
	STAIRCASE LANDING				
F	generally	2	m3		
	RC WALLS				
G	generally	39	m3		
	CANOPY Beams				
H	attached deep; greater than 5% reinforcement	4	m3		
	FORMWORK FOR IN SITU CONCRETE				
	Formwork and basic finish				
	Edges of suspended slabs; plain vertical				
I	height 75 - 150	308	m		
	Steps in top surfaces; plain vertical				
J	height 75mm	8	m		
	Sides of the RAMP				
K	200 mm thick wall	66	m2		
	Edges of slabs; plain vertical				
L	height 225 -300	341	m2		
	Soffits of slabs; horizontal				
M	slab thickness not exceeding 150; height to soffit 1.50 - 3.00m	1391	m2		
	Soffits of landings; horizontal				
N	slab thickness not exceeding 200; height to soffit not exceeding 1.50m	7	m2		
	Carried to Summary				

GF/1/ / 1

PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	RC WALLS				
A	200mm wall ; height 3.2m	383	m2		
	Beams; attached to slabs				
B	regular shaped; rectangular; height to soffit 1.50 - 3.00m; ?nr	1157	m2		
	Beams; attached to slabs				
C	regular shaped; Circularr; ?nr	31	m2		
	Columns; isolated				
D	regular shaped; rectangular; ?nr	537	m2		
	Columns; isolated				
E	regular shaped; Circularr; ?nr	9	m2		
	Stairflights; 1200mm wide; 150mm thick waist; 150mm risers				
F	strings 300mm wide; ?nr	68	m		
	REINFORCEMENT FOR IN-SITU CONCRETE				
	Reinforcement bars; B.S.4449 hot rolled deformed high yield steel				
	Bent				
G	Asorted	62,468	kgs		
	Carried to Summary				

GF/1/ / 2

PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

					Total Ksh
	Collection From				
	GF/1//1				
	GF/1//2				
	IN - SITU CONCRETE Carried to Summary				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	MASONRY				
	BRICK/BLOCK WALLING				
	Fine Hand Dressed natural quarry Stones blocks; Aprox. 440 x 215 fron Lulunga or equally approved with 7N/mm2 Crushing strength and less than 15% Water absortion Rate Bedded; in 25mm Thick cement-Sand mortar joints vertical and horizontal mortar (1:3)				
	Walls				
A	200mm thick; External walls	601	m2		
B	200mm thick; Internal walls	1321	m2		
	STONE WALLING FINISHES				
	PLASTERED/RENDERED/ROUGHCAST COATINGS				
	Mortar cement and sand (1:3); steel trowelled				
C	12mm thick cement/sand (1:4) wood float render to walls below windows parapet walls, columns, beams externally	601	m2		
	Expansion Joint				
D	25mm thick expansion joint with 'flexcell' joint filler or similar to engineer's approval including formwork	12	m2		
	MASONRY Carried to Summary				

GF/1/ / 4

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	WINDOWS/DOORS/STAIRS				
	ALUMINIUM WINDOWS				
	Supply,assemble and fix the following purpose made heavy duty powder coated aluminium window with profiles from an approved manufacture incoporating hooded mosquito proofing complete with iron mongery from an approved aluminium window specialist				
A	3300 X 1800 mm high	1	Nr		
B	3400 x 1800 mm high	13	Nr		
C	3200 x 1800 mm high	1	Nr		
D	2500 x 1800 mm high	3	Nr		
E	2400 x 1800 mm high	9	Nr		
F	2300 x 1800 mm high	2	Nr		
G	1000 x 2400 mm high	6	Nr		
H	1800 x 1800 mm high	1	Nr		
I	600x 1800 mm high	8	Nr		
J	3400 x 1000 mm high	6	Nr		
	Totals Carried to Collection				

GF/1/ / 8

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	Flush doors; As Raiply Ltd Standards or equally approved Interior quality; half hour fire check; 3mm plywood facings; factory finish; hardwood lipping All edges; Including cutting for and fixing 200 x 750x 5mm clear Glass vision Panel.				
A	1200 x 2100 x 45mm double swing leaf on both sides	12	Nr		
B	900 x 2100 x 45mm	13	Nr		
	Flush doors Interior quality; semi-solid core plywood facings for paint finish softwood lipping two long edges; * range				
C	900 x 2100 x 45mm	14	Nr		
	Door frames and door lining sets in mahogany hardwood wrot selected for matching grain and colour 1 nr set				
D	150 x 50mm jambs; labours - 4; fixing to masonry with screws	110	m		
E	100 x 50mm jambs; labours - 4; fixing to masonry with screws	62	m		
F	150 x 50mm jambs; labours - 4; fixing to masonry with screws	27	m		
G	100 x 50mm heads; labours - 4	14	m		
H	100 x 50mm transomes -lengths; labours - 5	39	m		
I	30mm Quadrants	147	m		
J	40 x 25 architraves; labours - 2	147	m		
K	40 x 25 glazing beads; labours - 1	112	m		
	Totals Carried to Collection				

GF/1/ / 8

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	DOORS				
	Doors in Powder coated Aluminium steel				
A	3000 x 2400mm high Aluminium pannel door comprising of 2 No. Size 300 x 1000 mm high and 6mm thick glass panels including 300 x 1000mm high double plates complete with 100 x 50 x 3mm RHS framing and metal lugs including purpose made hanging and locking accessories including three lever mortice lock as per 'Union' Ref 2277 or other equal and approved manufacturer	5	Nr		
B	2200 x 2400mm high Aluminium pannel door comprising of 6 No. Size 300 x 350 mm high and 6mm thick glass panels including 900 x 350mm high double plates complete with 100 x 50 x 3mm RHS framing and metal lugs including purpose made hanging and locking accessories once primed with red oxide primer before delivery to the site including three lever mortice lock as per 'Union' Ref 2277 or other equal and approved manufacturer	1	Nr		
C	1500 x 2400mm high Aluminium pannel door comprising of 6 No. Size 300 x 350 mm high and 6mm thick glass panels including 900 x 350mm high double plates complete with 100 x 50 x 3mm RHS framing and metal lugs including purpose made hanging and locking accessories once primed with red oxide primer before delivery to the site including three lever mortice lock as per 'Union' Ref 2277 or other equal and approved manufacturer approximate weight *kg; fixing to masonry with screws	1	Nr		
D	1200 x 2400mm high Aluminium pannel door comprising of 6 No. Size 300 x 350 mm high and 6mm thick glass panels including 900 x 350mm high double plates complete with 100 x 50 x 3mm RHS framing and metal lugs including purpose made hanging and locking accessories once primed with red oxide primer before delivery to the site including three lever mortice lock as per 'Union' Ref 2277 or other equal and approved manufacturer approximate weight *kg; fixing to masonry with screws	1	Nr		
E	900 x 2400mm high Aluminium pannel door comprising of 1 No. Size 300 x 350 mm high and 6mm thick glass panels including 900 x 350mm high double plates complete with 100 x 50 x 3mm RHS framing and metal lugs including purpose made hanging and locking accessories once primed with red oxide primer before delivery to the site including three lever mortice lock as per 'Union' Ref 2277 or other equal and approved manufacturer approximate weight *kg; fixing to masonry with screws	1	Nr		
	METAL STAIRS/WALKWAYS/ BALUSTRADES				
	Balustrades in steel; one coat red lead primer before delivery to site				
	40 X 2mm Isolated balustrades; RHS; welded fabrication ground to smooth				
F	1m high; casting into mortices in concrete; wedging in position; temporary wedges	96	m		
	40 x 2mm Isolated handrails; RHS; welded fabrication ground to smooth finish				
G	1m high; welding balusters to steel	56	m		
	Totals Carried to Collection				

GF/1/ / 10

					Total Ksh
	GENERAL GLAZING				
	Glass; B.S.952 clear sheet				
A	4mm thick to wood rebates with bradded wood beads (included elsewhere) and B.S.544 putty 0.15 - 4.00m2	209	m2		
	Glass; B.S.952 obsecure sheet				
B	4mm thick to metal rebates with metal casement glazing compound 0.15 - 4.00m2	22	m2		
	Totals Carried to Collection				
	Collection From				
1	GF/1//8				
2	GF/1//9				
3	GF/1//10				
4	From Above				
	TOTAL FOR WINDOWS/DOORS/STAIRS Carried to Summary				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	SURFACE FINISHES				
	SAND CEMENT/CONCRETE/GRANOLITHIC SCREEDS/FLOORING				
	Mortar cement and sand (1:3)				
	30mm work to floors on concrete base; one coat; screeded to receive ceramic tiles				
A	level and to falls only not exceeding 15 degrees from horizontal	1349	m2		
	PLASTERED/RENDERED/ROUGHCAST COATINGS				
	15mm work to ceilings on concrete base				
B	width exceeding 300	1391	m2		
	Mortar cement and sand (1:4); air entrained; wood floated; as Specification M20.140				
	15mm work to isolated beams on concrete base				
C	width exceeding 300	154	m2		
	15mm work to isolated columns on concrete base				
D	width exceeding 300	317	m2		
	Totals Carried to Collection				

GF/1/ / 12

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	STONE/CONCRETE/CERAMIC TILING/MOSAIC				
	Ceramic tiles B.S.6431 glazed white; 2 joints symmetrical layout; fixing with adhesive grouting with white cement grout				
	200 x 300 x 6mm units to walls on sand and cement base				
A	plain width exceeding 300	428	m2		
	330 x 330 x 9mm units to floors on cement and sand base; level to falls only not exceeding 15 degrees from horizontal				
B	plain	146	m2		
	TERRAZO FLOOR FINISH				
C	30mm thick terrazo floor finish laid to fall degree n.e 15 degrees in 2 coloured marbles chip complete with plastic dividing strips, grinding and polishing to approval to; to ground floor level	1,203	SM		
D	Ditto but to Skirting	803	m		
	PAINTING/CLEAR FINISHING IN PREMIUM QUALITY PAINTS AS ''CROWN'' OR EQUALLY APPROVED				
	One coat sealer two full coats emulsion SILICON paint or equvallent with 10 years Manufucturerrs Fade free Warranty				
	Cement rendered general surfaces				
D	girth exceeding 300	601	m2		
	One coat universal undercoat two full coats of Premium venyle emulsion Matt paint				
	Plaster ceilings and beams 3.50 - 5.00m above floor				
E	girth exceeding 300	1391	m2		
	Totals Carried to Collection				

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Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	One coat universal undercoat two full coats Silk venyle emulsion paint to Plaster general surfaces				
A	girth exceeding 300	921	m2		
	One coat primer one undercoat one coat full gloss finish				
	Wood general surfaces				
B	isolated surfaces girth not exceeding 100mm	399	m		
	One coat primer two undercoats one coat full gloss finish				
	Wood general surfaces				
C	girth exceeding 300	119	m2		
	Iron or steel structural work				
D	girth exceeding 300	15	m2		
	Totals Carried to Collection				
	Collection From				
1	GF/1//12				
2	GF/1//13				
3	From Above				
	TOTAL FOR SURFACE FINISHES Carried to Summary				

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PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	BUILDING FABRIC SUNDRIES				
	IRONMONGERY				
	Ironmongery; British Standard fittings				
	to hardwood frames and flush doors				
A	100mm butt hinges; 3mm stainless steel	21	Pairs		
B	2 Lever mortice locks; ref ''UNION''	14	Nr		
	To metal				
C	200mm window stays; ref ''KENS METAL''	204	Nr		
D	window fasteners; ref ''KENS METAL''	157	Nr		
	BUILDING FABRIC SUNDRIES Carried to Summary				

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PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

					Total Ksh
	Collection from:-				
	IN - SITU CONCRETE				
	MASONRY				
	WINDOWS/DOORS/STAIRS				
	SURFACE FINISHES				
	BUILDING FABRIC SUNDRIES				
	To Final Summary				

PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

FIRST FLOOR

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	IN - SITU CONCRETE				
	Reinforced in-situ concrete; B.S.5328 designed mix C30 20 aggregate minimum cement content 290 kg/m3; vibrated				
	Suspended Slabs				
A	thickness not exceeding 150	296	m3		
	Beams				
B	attached deep; greater than 5% reinforcement	171	m3		
	Columns				
C	generally	53	m3		
	Staircases				
D	generally	22	m3		
E	Staircase Landing	2	m3		
	RAMP				
F	generally	5	m3		
	FORMWORK FOR IN SITU CONCRETE				
	Formwork and basic finish				
	Edges of suspended slabs; plain vertical				
G	height 75 - 150	308	m		
	Steps in top surfaces; plain vertical				
H	height 75mm	8	m		
	Sides of the RAMP				
I	200 mm thick wall	66	m2		
	Edges of slabs; plain vertical				
J	height 225 -300	259	m2		
	Soffits of slabs; horizontal				
K	slab thickness not exceeding 150; height to soffit				
	1.50 - 3.00m	1312	m2		
	Carried to Collection				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	Soffits of landings; horizontal				
A	slab thickness not exceeding 200; height to soffit not exceeding 1.50m	6	m2		
	Beams; attached to slabs				
B	regular shaped; rectangular; height to soffit 1.50 - 3.00m; ?nr	1169	m2		
	Beams; attached to slabs				
C	regular shaped; Circularr; ?nr	19	m2		
	Columns; isolated				
D	regular shaped; rectangular; ?nr	537	m2		
	Columns; isolated				
E	regular shaped; Circularr; ?nr	10	m2		
	Stairflights; 1200mm wide; 150mm thick waist; 150mm risers				
F	strings 300mm wide; ?nr	68	m		
	REINFORCEMENT FOR IN-SITU CONCRETE				
	Reinforcement bars; B.S.4449 hot rolled deformed high yield steel				
	Bent				
G	Asorted	57763	kgs		
	Carried to Collection				
	Collection From				
	FF/1//1				
	FF/1//2				
	TOTAL for IN - SITU CONCRETE Carried to Summary				

FF/1/ / 2

PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

03-first floor FLOOR

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	MASONRY				
	BRICK/BLOCK WALLING				
	Fine Hand Dressed natural quarry Stones blocks; Aprox. 440 x 215 fron Lulunga or equally approved with 7N/mm2 Crushing strength and less than 15% Water absortion Rate Bedded; in 25mm Thick cement-Sand mortar joints vertical and horizontal mortar (1:3)				
	Walls				
A	200mm thick; External walls	820	m2		
B	200mm thick; Internal walls	1176	m2		
	STONE WALLING FINISHES				
	PLASTERED/RENDERED/ROUGHCAST COATINGS				
	Mortar cement and sand (1:3); steel trowelled				
C	12mm thick cement/sand (1:4) wood float render to walls below windows parapet walls, columns, beams externally	820	m2		
	EXPANSION JOINT				
D	25MM Thick expansion joint with fexcell joint filler or similar tp Engineer's Approval including formworks.	12	m2		
	MASONRY Carried to Summary				

FF/1/ / 4

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	WINDOWS/DOORS/STAIRS				
	ALUMINIUM WINDOWS				
	Supply,assemble and fix the following purpose made heavy duty powder coated aluminium window with profiles from an approved manufacture incoporating hooded mosquito proofing complete with iron mongery from an approved aluminium window specialist				
A	3300 X 1800 mm high	1	Nr		
B	3400 x 1800 mm high	13	Nr		
C	3200 x 1800 mm high	1	Nr		
D	2500 x 1800 mm high	3	Nr		
E	2400 x 1800 mm high	9	Nr		
F	2300 x 1800 mm high	2	Nr		
G	1000 x 2400 mm high	6	Nr		
H	1800 x 1800 mm high	1	Nr		
I	600x 1800 mm high	8	Nr		
J	3400 x 1000 mm high	6	Nr		
	Totals Carried to Collection				

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Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	Flush doors; As Raiply Ltd Standards or equally approved Interior quality; half hour fire check; 3mm plywood facings; factory finish; hardwood lipping All edges; Including cutting for and fixing 200 x 750x 5mm clear Glass vision Panel.				
A	1200 x 2100 x 45mm double leaf	11	Nr		
B	1200 x 2100 x 45mm double swing	8	Nr		
C	900 x 2100 x 45mm	8	Nr		
	Flush doors Interior quality; semi-solid core plywood facings for paint finish softwood lipping two long edges; * range				
D	900 x 2100 x 45mm	31	Nr		
	Door frames and door lining sets in Mahogany hardwood wrot selected for matching grain and colour 1 nr set				
E	150 x 50mm jambs; labours - 4; fixing to masonry with screws	119	m		
F	100 x 50mm jambs; labours - 4; fixing to masonry with screws	137	m		
G	150 x 50mm heads; labours - 5	33	m		
H	100 x 50mm heads; labours - 4	31	m		
I	100 x 50mm transomes -lengths; labours - 5	31	m		
J	30mm Quadrants	302	m		
K	40 x 25 architraves; labours - 2	302	m		
L	40 x 25 glazing beads; labours - 1	157	m		
	Totals Carried to Collection				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	DOORS				
	Doors in Powder coated Aluminium steel				
A	2200 x 2400mm high mild steel pannel door comprising of 6 No. Size 300 x 350 mm high and 6mm thick glass panels including 900 x 350mm high double plates complete with 100 x 50 x 3mm RHS framing and metal lugs including purpose made hanging and locking accessories once primed with red oxide primer before delivery to the site including three lever mortice lock as per 'Union' Ref 2277 or other equal and approved manufacturer	1	Nr		
B	1500 x 2400mm high mild steel pannel door comprising of 6 No. Size 300 x 350 mm high and 6mm thick glass panels including 900 x 350mm high double plates complete with 100 x 50 x 3mm RHS framing and metal lugs including purpose made hanging and locking accessories once primed with red oxide primer before delivery to the site including three lever mortice lock as per 'Union' Ref 2277 or other equal and approved manufacturer approximate weight *kg; fixing to masonry with screws	1	Nr		
C	1200 x 2400mm high mild steel pannel door comprising of 6 No. Size 300 x 350 mm high and 6mm thick glass panels including 900 x 350mm high double plates complete with 100 x 50 x 3mm RHS framing and metal lugs including purpose made hanging and locking accessories once primed with red oxide primer before delivery to the site including three lever mortice lock as per 'Union' Ref 2277 or other equal and approved manufacturer approximate weight *kg; fixing to masonry with screws	1	Nr		
D	900 x 2400mm high mild steel pannel door comprising of 6 No. Size 300 x 350 mm high and 6mm thick glass panels including 900 x 350mm high double plates complete with 100 x 50 x 3mm RHS framing and metal lugs including purpose made hanging and locking accessories once primed with red oxide primer before delivery to the site including three lever mortice lock as per 'Union' Ref 2277 or other equal and approved manufacturer approximate weight *kg; fixing to masonry with screws	1	Nr		
	METAL STAIRS/WALKWAYS/ BALUSTRADES				
	Balustrades in steel; one coat red lead primer before delivery to site				
	40 X 2mm Isolated balustrades; RHS; welded fabrication ground to smooth finish				
E	1m high; casting into mortices in concrete; wedging in position; temporary wedges	96	m		
	40 x 2mm Isolated handrails; RHS; welded fabrication ground to smooth finish				
F	1m high; welding balusters to steel	56	m		
	Totals Carried to Collection				

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					Total Ksh
	GENERAL GLAZING				
	Glass; B.S.952 clear sheet				
	4mm thick to wood rebates with bradded wood beads (included elsewhere) and B.S.544 putty				
A	0.15 - 4.00m2	209	m2		
	Glass; B.S.952 obsecure sheet				
	4mm thick to metal rebates with metal casement glazing compound				
B	0.15 - 4.00m2	22	m2		
	Totals Carried to Collection				
	Collection From				
1	FF/1//8				
2	FF/1//9				
3	FF/1//10				
4	FROM ABOVE				
	TOTAL FOR WINDOWS/DOORS/STAIRS Carried to Summary				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	SURFACE FINISHES				
	SAND CEMENT/CONCRETE/GRANOLITHIC SCREEDS/FLOORING				
	Mortar cement and sand (1:3)				
	30mm work to floors on concrete base; one coat; screeded to receive ceramic tiles				
A	level and to falls only not exceeding 15 degrees from horizontal	1349	m2		
	PLASTERED/RENDERED/ROUGHCAST COATINGS				
	15mm work to ceilings on concrete base				
B	width exceeding 300	1312	m2		
	Mortar cement and sand (1:4); air entrained; wood floated; as Specification M20.140				
	15mm work to isolated beams on concrete base				
C	width exceeding 300	154	m2		
	15mm work to isolated columns on concrete base				
D	width exceeding 300	317	m2		
	Totals Carried to Collection				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	STONE/CONCRETE/CERAMIC TILING/MOSAIC				
	Ceramic tiles B.S.6431 glazed white; 2 joints symmetrical layout; fixing with adhesive grouting with white cement grout				
	200 x 300 x 6mm units to walls on sand and cement base				
A	plain width exceeding 300	539	m2		
	330 x 330 x 9mm units to floors on cement and sand base; level to falls only not exceeding 15 degrees from horizontal				
B	plain	146	m2		
	TERRAZO FLOOR FINISH				
C	30mm thick terrazo floor finish laid to fall degree n.e 15 degrees in 2 coloured marbles chip complete with plastic dividing strips, grinding and polishing to approval to; to around floor level	982.00	SM		
D	Ditto but 100mm high skirting	580	SM		
	PAINTING/CLEAR FINISHING IN PREMIUM QUALITY PAINTS AS "CROWN" OR EQUALLY APPROVED				
	One coat sealer two full coats emulsion SILICON paint or equvallent with 10 years Manufacturerrs Fade free Warranty				
	Cement rendered general surfaces				
D	girth exceeding 300	820	m2		
	One coat universal undercoat two full coats of Premium venyle emulsion Matt paint				
	Plaster ceilings and beams 3.50 - 5.00m above floor				
E	girth exceeding 300	1312	m2		
	Totals Carried to Collection				

FF/1/ / 13

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	One coat universal undercoat two full coats Silk venyle emulsion paint				
	Plaster general surfaces				
A	girth exceeding 300	810	m2		
	One coat primer one undercoat one coat full gloss finish				
	Wood general surfaces				
B	isolated surfaces girth not exceeding 100mm	501	m		
	One coat primer two undercoats one coat full gloss finish				
	Wood general surfaces				
C	girth exceeding 300	171	m2		
	Iron or steel structural work				
D	girth exceeding 300	15	m2		
	Totals Carried to Collection				
	Collection From				
1	FF/1//12				
2	FF/1//13				
3	From Above				
	TOTAL FOR SURFACE FINISHES Carried to Summary				

FF/1/ / 14

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	BUILDING FABRIC SUNDRIES				
	IRONMONGERY				
	Ironmongery; British Standard fittings				
	to hardwood frames and flush doors				
A	100mm butt hinges; 3mm stainless steel	47	Pairs		
B	2 Lever mortice locks; ref "UNION"	31	Nr		
	To metal				
C	200mm window stays; ref "KENS METAL"	204	Nr		
D	window fasteners; ref "KENS METAL"	157	Nr		
	BUILDING FABRIC SUNDRIES Carried to Summary				

FF/1/ / 16

PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

					Total Ksh
	Collection from:-				
	IN - SITU CONCRETE				
	MASONRY				
	WINDOWS/DOORS/STAIRS				
	SURFACE FINISHES				
	BUILDING FABRIC SUNDRIES				
	To Final Summary				

PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

SECOND FLOOR

PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

04-SECOND FLOOR

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	IN - SITU CONCRETE				
	Reinforced in-situ concrete; B.S.5328 designed mix C30 20 aggregate minimum cement content 290 kg/m3; vibrated				
	Slabs				
A	thickness not exceeding 150	48	m3		
	Beams				
B	attached deep; greater than 5% reinforcement	171	m3		
	Columns				
C	generally	53	m3		
	Staircases				
D	generally	33	m3		
	RAMP				
E	generally	5	m3		
	FORMWORK FOR IN SITU CONCRETE				
	Formwork and basic finish				
	Steps in top surfaces; plain vertical				
F	height 75mm	8	m		
	Sides of the RAMP				
G	200 mm thick wall	66	m2		
	Soffits of landings; horizontal				
H	slab thickness not exceeding 200; height to soffit not exceeding 1.50m	6	m2		
	Total Carried to Collection				

SF/1/ / 1

PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

04-SECOND FLOOR

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	Beams; attached to slabs				
A	regular shaped; rectangular; height to soffit 1.50 - 3.00m; ?nr	1169	m2		
	Beams; attached to slabs				
B	regular shaped; Circularr; ?nr	19	m2		
	Columns; isolated				
C	regular shaped; rectangular; ?nr	537	m2		
	Columns; isolated				
D	regular shaped; Circularr; ?nr	25	m2		
	Stairflights; 1200mm wide; 150mm thick waist; 150mm risers				
E	strings 300mm wide; ?nr	68	m		
	Edges of suspended slabs; plain vertical				
G	height 75 - 150	383	m		
	Soffits of slabs; horizontal				
L	slab thickness not exceeding 150; height to soffit 1.50 - 3.00m	207	m2		
	REINFORCEMENT FOR IN-SITU CONCRETE				
	Reinforcement bars; B.S.4449 hot rolled deformed high yield steel Bent				
F	Asorted	42691	kgs		
	Total Carried to Collection				
	Collection From				
1	SF/1//1				
2	SF/1//2				
	TOTALS FOR IN - SITU CONCRETE Carried to Summary				

SF/1/ / 2

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	MASONRY				
	BRICK/BLOCK WALLING				
	Fine Hand Dressed natural quarry Stones blocks; Aprox. 440 x 215 fron Lulunga or equally approved with 7N/mm2 Crushing strength and less than 15% Water absortion Rate Bedded; in 25mm Thick cement-Sand mortar joints vertical and horizontal mortar (1:3)				
	Walls				
A	200mm thick; External walls	820	m2		
B	200mm thick; Internal walls	1176	m2		
	STONE WALLING FINISHES				
	PLASTERED/RENDERED/ROUGHCAST COATINGS				
	Mortar cement and sand (1:3); steel trowelled				
C	12mm thick cement/sand (1:4) wood float render to walls, parapet walls, columns, beams externally	820	m2		
	MASONRY Carried to Summary				

GF/1/ / 4

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	WINDOWS/DOORS/STAIRS				
	ALUMINIUM WINDOWS				
	Supply,assemble and fix the following purpose made heavy duty powder coated aluminium window with profiles from an approved manufacture incoporating hooded mosquito proofing complete with iron mongery from an approved aluminium window specialist				
A	2500 X 1800 mm high	9	Nr		
B	3350 X 1800 mm high	7	Nr		
C	3300 x 1800 mm high	1	Nr		
D	3200 x 1800 mm high	2	Nr		
E	2800 x 1800 mm high	11	Nr		
F	2540 x 2400 mm high	5	Nr		
G	2300 x 1800 mm high	2	Nr		
H	1200 x 2400 mm high	7	Nr		
I	2950 x 1800 mm high	1	Nr		
J	900x 1800 mm high	6	Nr		
K	3400 x 1000 mm high	9	Nr		
	Totals Carried to Collection				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	Flush doors; As Raiply Ltd Standards or equally approved Interior quality; half hour fire check; 3mm plywood facings; factory finish; hardwood lipping All edges; Including cutting for and fixing 200 x 750x 5mm clear Glass vision Panel.				
A	1200 x 2100 x 45 double leaf openable on both sides	20	Nr		
B	900 x 2100 x 45	6	Nr		
	Flush doors Interior quality; semi-solid core plywood facings for paint finish softwood lipping two long edges; * range				
C	900 x 2100 x 45mm	22	Nr		
	Door frames and door lining sets in hardwood wrot selected for matching grain and colour 1 nr set				
D	150 x 50mm jambs; labours - 4; fixing to masonry with screws	88	m		
E	100 x 50mm jambs; labours - 4; fixing to masonry with screws	97	m		
F	150 x 50mm heads; labours - 5	30	m		
G	100 x 50mm heads; labours - 4	22	m		
H	100 x 50mm transome; labours - 5	52	m		
I	30mm Quadrants	251	m		
J	40 x 25 architraves; labours - 2	251	m		
K	40 x 25 glazing beads; labours - 1	100	m		
	Totals Carried to Collection				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	METAL DOORS **Doors in Powder coated Aluminium steel**				
A	2200 x 2400mm high mild steel pannel door comprising of 6 No. Size 300 x 350 mm high and 6mm thick glass panels including 900 x 350mm high double plates complete with 100 x 50 x 3mm RHS framing and metal lugs including purpose made hanging and locking accessories once primed with red oxide primer before delivery to the site including three lever mortice lock as per 'Union' Ref 2277 or other equal and approved manufacturer	1	Nr		
B	1500 x 2400mm high mild steel pannel door comprising of 6 No. Size 300 x 350 mm high and 6mm thick glass panels including 900 x 350mm high double plates complete with 100 x 50 x 3mm RHS framing and metal lugs including purpose made hanging and locking accessories once primed with red oxide primer before delivery to the site including three lever mortice lock as per 'Union' Ref 2277 or other equal and approved manufacturer approximate weight *kg; fixing to masonry with screws	1	Nr		
C	1200 x 2400mm high mild steel pannel door comprising of 6 No. Size 300 x 350 mm high and 6mm thick glass panels including 900 x 350mm high double plates complete with 100 x 50 x 3mm RHS framing and metal lugs including purpose made hanging and locking accessories once primed with red oxide primer before delivery to the site including three lever mortice lock as per 'Union' Ref 2277 or other equal and approved manufacturer approximate weight *kg; fixing to masonry with screws	1	Nr		
D	900 x 2400mm high mild steel pannel door comprising of 6 No. Size 300 x 350 mm high and 6mm thick glass panels including 900 x 350mm high double plates complete with 100 x 50 x 3mm RHS framing and metal lugs including purpose made hanging and locking accessories once primed with red oxide primer before delivery to the site including three lever mortice lock as per 'Union' Ref 2277 or other equal and approved manufacturer approximate weight *kg; fixing to masonry with screws	1	Nr		
	METAL STAIRS/WALKWAYS/ BALUSTRADES **Balustrades in steel; one coat red lead primer before delivery to site** **40 X 2mm Isolated balustrades; RHS; welded** **fabrication ground to smooth finish**				
E	1m high; casting into mortices in concrete; wedging in position; temporary wedges	96	m		
	Totals Carried to Collection				

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					Total Ksh
	40 x 2mm Isolated handrails; RHS; welded fabrication ground to smooth finish				
A	1m high; welding balusters to steel	56	m		
	GENERAL GLAZING				
	Glass; B.S.952 clear sheet 4mm thick to wood rebates with bradded wood beads (included elsewhere) and B.S.544 putty				
B	0.15 - 4.00m2	181	m2		
	Glass; B.S.952 obsecure sheet 4mm thick to metal rebates with metal casement glazing compound				
C	0.15 - 4.00m2	31	m2		
	Totals Carried to Collection				
	Collection From				
1	GF/1//8				
2	GF/1//9				
3	GF/1//10				
4	From Above				
	TOTAL FOR WINDOWS/DOORS/STAIRS Carried to Summary				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	SURFACE FINISHES				
	SAND CEMENT/CONCRETE/GRANOLITHIC SCREEDS/FLOORING				
	Mortar cement and sand (1:3)				
	30mm work to floors on concrete base; one coat; screeded to receive ceramic tiles				
A	level and to falls only not exceeding 15 degrees from horizontal	1349	m2		
	PLASTERED/RENDERED/ROUGHCAST COATINGS				
	Mortar cement and sand (1:4); air entrained; wood floated;				
	15mm work to isolated beams on concrete base				
B	width exceeding 300	154	m2		
	15mm work to isolated columns on concrete base				
C	width exceeding 300	317	m2		
	Ceiling				
	Gypsum ceiling				
D	Supply and lay 12mm thick plain gypsum boards complete with 50 x 50mm cyprees brandering and matching cornices to Approval	1210	SM		
	Totals Carried to Collection				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	STONE/CONCRETE/CERAMIC TILING/MOSAIC				
	Ceramic tiles B.S.6431 glazed white; 2 joints symmetrical layout; fixing with adhesive grouting with white cement grout				
	200 x 300 x 6mm units to walls on sand and cement base				
A	plain width exceeding 300	539	m2		
	330 x 330 x 9mm units to floors on cement and sand base; level to falls only not exceeding 15 degrees from horizontal				
B	plain	146	m2		
	TERRAZO FLOOR FINISH				
C	30mm thick terrazo floor finish laid to fall degree n.e 15 degrees in 2 coloured marbles chip complete with plastic dividing strips, grinding and polishing to approval to; to ground floor level	982.00	SM		
D	Ditto but to Skirting	580	M		
	PAINTING/CLEAR FINISHING IN PREMIUM QUALITY PAINTS AS "CROWN" OR EQUALLY APPROVED				
	One coat sealer two full coats emulsion SILICON paint or equvallent with 10 years Manufacturerrs Fade free Warranty				
	Cement rendered general surfaces				
E	girth exceeding 300	820	m2		
	One coat universal undercoat two full coats of Premium venyle emulsion Matt paint				
	Plaster ceilings and beams 3.50 - 5.00m above floor				
F	girth exceeding 300	1210	m2		
	One coat universal undercoat two full coats Silk venyle emulsion paint				
	Plaster general surfaces				
G	girth exceeding 300	810	m2		
	Totals Carried to Collection				

PROPOSED DR. JOYCE LABOSO MEMORIAL MOTHER AND CHILD WELLNESS CENTRE.

04-SECOND FLOOR

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	One coat primer one undercoat one coat full gloss finish				
	Wood general surfaces				
A	isolated surfaces girth not exceeding 100mm	422	m		
	One coat primer two undercoats one coat full gloss finish				
	Wood general surfaces				
B	girth exceeding 300	124	m2		
	Iron or steel structural work				
C	girth exceeding 300	15	m2		
	Totals Carried to Collection				
	Collection From				
1	SF/1//12				
2	SF/1//13				
3	From Above				
	TOTAL FOR SURFACE FINISHES Carried to Summary				

SF/1/ / 14

	ELEMENT 4 **ROOF AND CEILLING**				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	STRUCTURAL STEEL				
	MILD STEEL MEMBERS				
	Roof members; pitched				
A	75X75X4 SHS; Wall plate	0	m		
B	75X50X3 SHS; Tie beams	655	m		
C	75X50X3 SHS; Rafters	744	m		
D	50X50X3 SHS; Strut and ties.	1,456	m		
E	75X50X3 SHS;King posts	122	m		
G	50X50X3 SHS; Ridge boards	76	m		
H	Z-10020 (102x53x49x14x2.0; Purlins	1,439.00	m		
	Brandering in sawn softwood Cypress Timber				
J	width exceeding 300; 50 x 50 members at 600mm centres each way	1273	m2		
	Softwood wrot				
	Fascia and barge boards				
K	width not exceeding 300; 25mm thick x 250mm wide	340	m		
	STRUCTURAL MEMBERS Carried to Summary				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	CLADDING/COVERING				
	METAL PROFILED CLADDING/COVERING				
	Roof coverings;Factory Prepainted corrugated sheets as MRM 11/3; nominal overall thickness 26g ; natural soffit and top surface; 150 end laps and one corrugation side laps				
	Coverings; fixing to timber joists at 1250mm general spacing with galvanized mild steel drive screws; drilling holes				
A	pitch 25 degrees	1261	m2		
	HIP				
B	28G; 450mm wide in matching colors to the roof cover	129	m		
	Valleys				
C	28G; 450mm wide in matching colors to the roof cover	81	m		
	CLADDING/COVERING Carried to Summary				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	CEILLING				
	RIGID SHEET FINE LININGS				
	Wood chipboard B.S.5669 type 1 standard; butt joints				
	12mm thick to ceilings				
A	width exceeding 300	1210	m2		
	Softwood wrot; one coat primer before delivery to site				
	Cover fillets stops trims beads nosings and the like				
B	25 x 100mm; Cornices; Coved; 3 labor	849	m		
	Roof rainwater disposal				
C	75 x 100 mm diameter down pipe fixed to wall with and	120	LM		
D	150mm diameter half round pvc gutter complete with	340	LM		
	Extra over for				
E	100 x 75 mm swan neck	10	NO		
F	100 x 75 mm shoe	10	NO		
G	100 x 75 mm stopped ends	10	NO		
	CEILLING Carried to Summary				

					Total Ksh
	Collection from:-				
1	STRUCTURAL STEEL				
2	CLADDING/COVERING				
3	CEILLING				
	To Final Summary				

PROPOSED MOTHER AND CHILD WELLNESS CENTRE.

					Amount
	GRAND SUMMARY - MAIN BULDING BULDERS WORKS				
1	SUBSTRUCTURE				
2	GROUND FLOOR WORKS				
3	FIRST FLOOR WORKS				
4	SECOND FLOOR WORKS				
5	ROOF WORK				
	TOTAL CARRIED TO FORM OF TENDER				

AMOUNT IN WORDS…..
…..

(SIGNATURE OF EMPLOYER) (SIGNATURE OF QUANTITY SURVEYOR)

NAME OF THE CONTRACTOR; ….....

ADDRESS: _____ ADDRESS: _____

NAME OF AUTHORIZED PERSON…..

DATE : _____ DATE : _____

REPUBLIC OF KENYA

COUNTY GOVERNMENT OF BOMET.
DEPARTMENT OF ROADS,TRANSPORT AND PUBLIC WORKS

SPECIFICATIONS AND MECHANICAL BILLS OF QUANTITIES
FOR
THE PROPOSED CONSTRUCTION OF
BOMET MOTHER AND CHILD WELLNESS CENTRE

AT

BOMET COUNTY

ARCHITECTS

BOMET COUNTY

P.O. BOX 19-20400

BOMET

QUANTITY SURVEYORS

BOMET COUNTY

P.O. BOX 19-20400

BOMET

SERVICES ENGINEERS

BOMET COUNTY ENGINEERS

P.O. BOX 19-20400

BOMET

KENYA

JULY, 2021

PROPOSED CONSTRUCTION MOTHER AND CHILD WELLNESS CENTRE

BILLS OF QUANTITIES FOR PLUMBING ,DRAINAGE,FIRE FIGHTING & VENTILLATION INSTALLATIONS PHASE 1

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	BILL NO. 1A:- SANITARY FITTINGS				
	Supply, deliver and install the following sanitary fittings including all the necessary fittings and jointing.**Tenderers to note that ANY ALTERNATIVE will ONLY be considerd if they MATCH of exceed the specified items interms of TECHNICAL capabilities and MUST be accompanied with PRODUCT CATALOGUES**				
A	Vitreous China' floor standing back inlet water closet pan in white, Horizontal outlet with heavy-duty seat and cover complete with metal hinges. Model to be as "Duravit /Roca ' or an approved equivalent.(Medics water closet)	23	No.		
B	Vitreous China' floor Asian type water closet pan in white, "Squad type" Model to be as 'Twyford' or an approved equivalent.(Patient water closet)	27	No.		
C	WC "S" or "P" connector to drain pipe for horizontal outlet WC Pan	50	No.		
D	W.C Flush Valve, top entry regular 32mm Size with concealed body and with Exposed Shut off provision, integral vacuum breaker, bent flush pipe, rubberpipe connector, Rectangular Dual Flush Plate, ABS Chrome Plated(3.0/6.0 Lts. Per flush) and a Working Pressure 1.0 to 4.0Bar(Max) . The flush valves shall be supplied with adaptor for connection to the W.C PAN as Jaquar/Roca /Docol flush valve or equal and approved.	46	No.		
E	Double toilet roll holder with spindle system for recessed mounting, stainless steel, surface satin finish, material thickness, folded front cover, cylinder lock with standard key for 2 rolls inclusive with all mounting accessories	46	No.		
F	Urinal bowl with urinal rim flushing , back inlet and concealed waste complete with a P Trap or a bottle trap Ø 40 mm, urinal connection set and fixing. Set to be as "Roca chick"or equal and approved.	18	No.		
G	Urinal flush valves to be as Jaquar/Roca /Docol flush valve or equal and approved.	18			
	Total C/F to Page 2				

BILL NO. 1A:- SANITARY FITTINGS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	Total B/F from Page 1				
A	Doc M Contour 21+ close coupled rigtt hand corner pack, WC pan, water saving delay fill cistern with spatula lever, basin, grab rails, hinged support rail with toilet roll holder, seat no cover with retaining buffers, copper tails on TMV3 mixer tap or equal and approved	1	No.		
	Wash Hand Basin-Medical Sinks				
B	Medical wash hand basins manufactured from grade 304 (18/10) stainless steel 1.6mm gauge (top) and bowls 1.2 mm gauge, pressed bowls size 360mm diameter x 150mm deep with 40mm waste outlets, 3 mm mounting bracket for reinforcement, satin finish with polished bowls, vandal proof. Brand to be as Franke 356658 or an approved equivalent	12	No.		
C	Medical elbow-action pillar tap with high waist complete with ¼" turn ceramic disc, Reinforcing back plate, Aerated fixed straight outlet SABS approved, SANS 226 Type 2. To be as "Cobra" 511-21 or equal and approved	12	No.		
	Wash Hand Basins				
D	oval Counter top/Under Counter Wash hand basin size 450 x 340mm in vitreous china with 1 No. center tap-hole	40	No.		
E	Pedestal Wash hand basin lin vitreous china with 1 No. center tap-hole as Roca Aloa or equal and approved size	8	No.		
F	Wall hung Wash hand basin lin vitreous china with 1 No. center tap-hole as Roca Aloa or equal and approved size	12	No.		
	Whb faucet				
G	Single non-concessive self-closing basin push tap as EUROBATH or equal andapproved equivalent(Medics Washrooms)	14			
H	Hospital type Wash hand basin faucet .The basin shall have a single level basin mixer with extra long handle as Hansgrohe Focus care ref: #31911000. All to be as Duravit and Hansgrohe brands or equal and approved.	30			
	Baby Changing Unit				
I	As ASI baby changing unit No. ASI-10-9012	2	No.		
J	Robe hook:Surface mounted double robe hook, made of AISI 304 stainless steel, satin finish complete with screws fixed in the inside of thetoilet door.	46			
	Total C/F to Page 3				

BILL NO. 1A:- SANITARY FITTINGS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	Total B/F from Page 3				
A	Cleaners sink as ASL Stainless Steel WTB-S or approved equivalent. The sink to be supplied complete with bib tap, 1½" chrome plated grid waste, 1½" chrome plated bottle trap and 75 mm seal,Legs and bearers with sink screwed to wall using built-in brackets	6	No.		
B	Stainless steel mirror for wall mounting with reflective polished surface, material thickness 1mm, four visible fixation points including stainless steel screws and dowels size 600x 500 mm	6	No.		
C	Automatic surface mounted, bright stainless steel, heavy duty, plastic glued/screwed to wall liquid soap dispenser complete with initial charge, key and mounting brackets as "Mediclinic's"or equal and approved.	26	No.		
D	Surface mounted auto-cut roll paper towel dispenser, made of AISI 304 stainless steel, satin finish as "Mediclinic's"or equal and approved.	26	No.		
E	**Shower Fittings** Shower set complete with ;Wall mounted Chrome plated bath/shower mixer and shower head.The shower fittings should be AntiVandal suitable for public use.	28	No.		
F	Recessed into wall soap dish in stainless steel	28	No.		
G	Sluice **Room Sink**: 600x600x254mm, Single Bowl, No Tap Hole stainless steel hospital sink to HBN 00-10C Standard. The unit to be complete with Waste, chrome plated bottle trap, Stainless steel type 304 to EN 1 4401, 1.5mm thickness cantilever Brackets (Pair). The unit to be as "Twyford's" or equal and approved.	2	No.		
H	**Laboratory Sinks** ' Hychem Polypropylene Sinks' Model No. MS 505 Complete size 457 x 305 x 210 mm. complete with 0.78 liter catchport recovery trap .	2	No.		
I	**Surgeons Scrub** Floor mounted Surgeons scrub up unit, length 2100 mm manufactured in grade 304 918/10) stainless steel 1.6mm thick with 150mm high intergral splash back with radiused corners and provision for waste. The front and sides of the unit to be double walled construction with inner wall sprayed with vermin proof bitumastic sound deadening complete with mounting accesories	1	No.		
	Total Sanitary fittings Supply and Fix C/F to Summary Page				

BILL NO.2: COLD WATER SUPPLY PIPEWORK

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	Supply, deliver and install cold water polypropylene PP-R pipes and fittings to relevant B.S DIN and local standards. Tenderers must allow in their pipework prices for all the couplings, unions, connectors, joints, bypass bends, loop expansion bends, etc. in running lengths of pipes. Jointing & installation methods shall be as per manufacturers' recommendations only. All pipe diameters are internal diameters. **Tenderers must allow in their prices for all couplings, connectors, holding brackets expansion joints as required in the running lengths of pipes.**				
A	**PPR Pipes PN 20**				
	i) 25mm ditto	340	LM		
	ii) 32mm ditto	270	LM		
	iii) 40mm ditto	120	LM		
	iv) 50mm ditto	204	LM		
	v) 65mm ditto	100	LM		
	vii) 75mm ditto	120	LM		
	vii) 100mm ditto	0	LM		
B	**Elbow and Bends**				
	i) 25mm ditto	250	No.		
	ii) 32mm ditto	170	No.		
	iii) 40mm ditto	60	No.		
	iv) 50mm ditto	90	No.		
	v) 75mm ditto	50	No.		
C	**Reducers**				
	i) 32x25mm ditto	98	No.		
	ii) 40x32mm ditto	60	No.		
	iii) 50x40mm ditto	70	No.		
	iv) 75x50mm ditto	1	No.		
	Total C/F to Summary Page 5				

BILL NO.2: COLD WATER SUPPLY PIPEWORK

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	Total B/F from Page 15				
A	**Tees**				
	i) 25mm diameter PP-R equal tee	90	No.		
	ii) 32mm ditto	80	No.		
	ii) 40mm ditto	45	No.		
	iii) 50mm ditto	70	No.		
	iv) 75mm ditto	50	No.		
B	**Female threaded joints**				
	i) 25mm diameter PP-R Female threaded joint	190	No.		
	ii) 32mm ditto	90	No.		
	iii) 40mm ditto	40	No.		
	iv) 50mm ditto	70	No.		
	v) 75mm ditto	50	No.		
C	**Male threaded joints**				
	i) 25mm diameter PP-R Female threaded joint	90	No.		
	ii) 32mm ditto	80	No.		
	iii) 40mm ditto	50	No.		
	iv) 50mm ditto	40	No.		
	v) 75mm ditto	10	No.		
D	**Isolation Valves**				
	(i) 25mm diameter Isolation valve	40	No.		
	(ii) 32mm ditto	10	No.		
	(ii) 40mm ditto	10	No.		
	(iii) 50mm ditto	4	No.		
	(iv) 75mm ditto	2	No.		
E	Angle valves as PEX-or equal and approved	80	No.		
F	15mm diameter x 300mm long flexible connectors.	80	No.		
	Total C/F to Summary Page				

AL DRAINAGE PIPEWORK

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	Supply, deliver and fix the following in UPVC soil and waste systes to BS 4514 and 5225 with fittings fixed in accordance to the manufacturer's printed instructions and BS 5572 and manufactured by KEY TERRRAIN as described. All UPVC branches, Tees, reducing tees, reducers etc. are to be formed in accordance to the manufacturere's printed instruction. The installations to have the various sizes of connectors, adaptors, sockets, reducers holdbats, clips etc. as required for satisfactory functions.				
A	Pipes				
	b) 100mm ditto	360	LM		
	b) 75mm ditto	150	LM		
	b) 50mm ditto	200	LM		
	c) 40mm ditto	120	LM		
B	Bends(90/45 dge c)				
	b) 100mm diameter UPVC sweep bend	60	No.		
	c) 75mm ditto	24	No.		
	d) 50mm ditto	90	No.		
	e) 40mm ditto.	60	No.		
C	Tees				
	b) 100mm diameter Sweep tee	43	No.		
	c) 75mm ditto	12	No.		
	d) 50mm ditto	60	No.		
	e) 40mm ditto	32	No.		
D	**Reducing sockets.**				
	b) 100x75mm ditto	6	No.		
	c) 100x50mm ditto	20	No.		
	d) 75x50mm ditto	60	No		
	e) 50x40mm ditto	35	No		
	Total C/F to Page 18				

BILL NO.3: INTERNAL DRAINAGE PIPEWORK

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	Total B/F from Page 17				
A	Inspection Plugs/Access caps				
	a) 150mm diameter access caps	4	No.		
	a) 100mm diameter inspection plugs	12	No.		
	b) 75mm ditto	12	No.		
	b) 50mm ditto	10	No.		
B	Four-way 100 x 50mm PVC floor trap complete with stainless steel grating.	35	No.		
C	100mm diameter WC connectors	48	No.		
D	100mm diameter gulley trap complete with chamber and cover.	10	No.		
E	100mm diameter vent cowl	10	No.		
F	100mm diameter weathering slate	10	No.		
G	2-way 100 x 50mm stainless steel shower floor trap complete with grating.	30	No.		
H	Allow a sum for special drainage on . laboratory sinks	1	Item		
I	Construct Gulley trap manhole with all necessary accessories to Engineers approval.	1	Item		
J	Allow for testing and commisining drainage system	1	Item		
	Total Internal drainage pipe work C/F to Summary Page				

BILL NO.4:RAINWATER DOWNPIPES

ITEM NO.	DESCRIPTION		UNIT	RATE	AMOUNT
	Supply, deliver and fix the following in UPVC 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 functions.				
A	Pipes				
	a) 150mm diameter UPVC Grey pipe (heavy duty)	50	LM		
	b) 100mm ditto	160	LM		
	b) 75mm ditto	40	LM		
	b) 50mm ditto	10	LM		
B	**Bends(90/45 dge c)**				
	a) 150mm diameter UPVC Access bend	8	No.		
	b) 100mm diameter UPVC Access bend	18	No.		
	c) 75mm ditto sweep bend	4	No.		
	d) 50mm ditto	4	No.		
C	**Tees**				
	a) 150mm diameter sweep tee	4	No.		
	b) 100mm diameter tee	12	No.		
D	**Inspection Plugs/Access caps**				
	a) 150mm diameter access caps	2	No.		
	a) 100mm diameter inspection plugs	7	No.		
E	**Fulboras**				
	a) 100mm diameter fulbora	12	No.		
	a) 75mm diameter fulbora	7	No.		
	Total for Rainwater downpipes C/F to Summary Page				

BILL NO. 5: WATER BOOSTER PUMPSET

ITEM No.	DESCRIPTION	QTY	- UNIT	RATE	AMOUNT
A	**Supply, install, test and commission Domestic Booster set of 2 No. Pumps** operating alternately complete with the following:- **Automatic electric motor driven water pumps with a capacity of 10m^3**/hr at 60 meters pressure head as **GRUNDFOS** model No. **CR 15-4** Automatic electric control panel as per specification for above pumps for alternate operation between the two pumps. -Base frame with anti vibration mountings -100mm dial pressure gauge (0-10 bar) -Variable delay timer so that once the pump has cut out due to attainment of pressure setting at the pressure switch, it will come ON again after a preset time on the timer subject to pressure loss in the line. -24 litres steel pressure booster vessel. -Pressure switch (Double Pole) arrangement including pressure switch and necessary valve and fittings and a delay timer. 50mm diameter gate valve as specified or equal and approved (2 No.) 50mm line strainer (2 No.) 50mm diameter check valve specified or equal and approved (2 No.) .50mm diameter galvanized malleable iron union. Electrical connection from isolators to control panel and from control panel to pumps including electric cabling and conduits All other necessary items for booster set	1	Set		
	Total for water booster pumps C/F to Summary Page				

BILL NO. 6: WATER TANKS

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	WATER STORAGE TANK **These works comprise the design, manufacture, supply, delivery, erection together with testing and commissioning of water storage tank as described below.** The tank shall be erected complete on bearing support prepared and designed by others and with all necessary pipes, ladders, towers, etc as listed herein.				
	Ground Water Storage Tank				
A	Water tank, 5 mm thick galvanised pressed steel plates (type 1 or 2) of capacity 108,000 litres and 6x6x 3plates (1.00x1.00m. each) high on bearing support to structural Engineer's detail complete with internal stays, cover and manhole.				
	The tank is to be complete with the following ;				
	a) Water level indicator	1	No.		
	b) Internal ladder	1	No.		
	c)Tank external ladder	1	No.		
	d)75mm diameter overflow	1	No.		
	e)75mm diameter washout with gate valve	1	No		
	f)50mm diameter vent with mosquito gauze	1	No.		
	g)100mm diameter outlets with gate valve	1	No.		
	h) 50mm ditto	2	No.		
	i) 50mm diameter inlet with high pressure ball valve	1	No		
	Roof Water Storage (Plasticwater tank)				
B	Plastic tank of gross capacity 10,000 litres sitting on the structure on above the staircase/ramp to structural Engineer's detail.The tank to be as Kentainer or equa and approved				
	The tank is to be complete with the following ;				
	a) Water level indicator	4	No.		
	b) Internal ladder				
	d) 50mm diameter overflow				
	e) 50mm diameter washout with gate valve				
	g) 50mm diameter outlets with gate valve				
	h) 50mm ditto				
	Total C/F to Summary Page				-

BILL NO.7: HOT WATER GENERATION AND DISTRIBUTION SYSTEM

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
A	Supply and fix the following in Glass Fibre Reinforced PPR (PN20) composite water pipes to ASTM F 1281/1282, EN ISO21003 with fittings fixed to manufacturer's printed instructions. Tenderers must allow in their pipework, and also where stated for pipes clips or holder bats, plugged and screwed.				
B	**Pipe Works(Internal diameters)**				
C	PPR(GFR) 25Ø	120	LM		
D	Ditto 32Ø	90	LM		
	Elbow 45°/ 90°				
E	PPR25Ø	120	NO		
F	Ditto 32Ø	90	NO		
	Tees				
G	Ditto 25Ø x 20Ø x 25Ø	40	NO		
H	Ditto 32Ø x 25Ø x 32Ø	50	NO		
	Adaptors				
I	20Ø x ½"	20	NO		
J	25Ø x ½"	20	NO		
K	32Ø x 1"	15	NO		
L	40Ø x 11/4"	20	NO		
	valves				
M	25Ø	18	NO		
N	32Ø	6	NO		
	Thermosiphoning Solar heating system				
O	Supply, Install and Commission Solar Water heaters non pressurised (200 liters) complete with solar collectors and mounting brackrts(To served 3zones)	12	NO		
	Total for hot water generation C/F to Summary Page				

BILL NO. 8: EXTERNAL WATER SUPPLY RETICULATION

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	Supply, deliver and fix the following in HDPE pressurized systems with fittings fixed in accordance to the manufacturer's printed instructions . All HDPE 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 function				
A	Pipes				
	a) 75mm diameter HDPE PN 12.5	400	LM		
	b) 50mm ditto	56	LM		
	Butt fusion fiitings				
B	Elbow				
	a) 75mm diameter HDPE PN 12.5	20	No.		
			No.		
	b) 50mm ditto	4	No.		
C	Tees				
	a) 75mm diameter HDPE PN 12.5	6	No.		
			No.		
	b) 50mm ditto	4	No.		
D	Pipe connectors				
	a) 75mm diameter HDPE PN 12.5	20	No.		
			No.		
	b) 50mm ditto	4	No.		
	Excavations				
E	Excavate trench approx. 300mm wide and with an average depth of 750mm for water distribution as described elsewhere in this document. Back fill, ram, and cart away the remainder	400	LM		
F	Gate Valves (Pegler)				
	a) 75mm diameter approved pattern brass rising stem full-way gate valve with wheel or equal and approved	4	No.		
G	water meter				
	a) 75mm dia water meter	4	No.		
H	Allow for Construction of valves chambers	1	Item		
	Total C/F to Summary Page				

BILL NO. 9: EXTERNAL DRAINAGE

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	Supply, deliver and fix the following in UPVC 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 function				
A	Pipes				
	a) 150mm diameter UPVC Grey pipe (heavy duty)	400	LM		
	b) 100mm ditto	56	LM		
	Excavations				
B	Excavate trench approx. 300mm wide and with an average depth of 750mm for water distribution as described elsewhere in this document. Back fill, ram, and cart away the remainder	400	LM		
C	Man holes(Builders work)				
	Allow connections to the Mn holes	1	item		
D	Allow for identification, excavation, removal, re-routing, re-connecting and setting to work, any existing water pipes that may be existing on site.	1	Item		
	Total C/F to Summary Page				

BILL NO. 10: HOSEREEL AND DRY RISER SYSTEM

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	Supply, fix, test and commission the following equipment and fitting as described:-				
	Tenderers must allow in pipework prices for all couplings, unions, nipples, sockets connectors, joints e.t.c in running lengths of pipes and also where necessary for fixing clips, holderbats plugged and screwed.				
A	Hosereel and Dry Rise System Pipework				
	a) 25mm diameter pipe GMS Classcto BS 1387	25	LM.		
	c) 50mm ditto	45	LM.		
	f) 80mm ditto	45	LM.		
	g) 100mm ditto	80	Llm		
B	Elbows				
	a) 25mm elbows malleable iron galvanized.	25	No.		
	c) 50mm ditto.	4	No.		
C	Tees				
	a) 50x25 mm diameter malleable iron equal tee	9	No		
	b) 80 x 65mm diameter unequal tee	9	No		
D	Reducers				
	a) 50 x 25mm malleable galvanized iron reducing bush	12	No.		
E	Valves				
	a) 25mm bronze gate valve to BS 5154	8	No.		
	b) 50mm air relief valve screwed as CRANE.	2	No.		
F	**Hose reels** Supply and Install automatic, cabinet mounted type hosereel with 30 meters long, 25Øhose manufactured to BS EN 671-1:2001 and nozzle having SHUT, JET and SPRAY setings. The hosereel should be manufactured to BS EN 694-2001 3169/2 1981 and be able to withstand maximum pressure of up to 15 bars.and LPCB certified	8	No.		
	Total C/F to Page 24				

BILL NO. 10 HOSEREEL AND DRY RISER SYSTEM

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	Total B/F from Page 23				
A	**Landing Valve** Supply and install DN2½" single outlet male threaded landing valve, oblque type. The body to made of copper alloy to BS EN 12163:1998 and be LPCB Certified	6	No.		
B	**Single Jacket Hose** Supply and install single 30 meters jacket hose manufactured according to BS 6391. The hose to include pin lug coupling & Nozzle manufactured to comply to BS 336:2010. Coupling to be LPCB Certified while the hose shall UL listed	6	No.		
C	**Breaching Inlet /Booster inlets** Supply and Install Fire service 4" x 2 way breeching inlet connection complete with Drain Valves complying with BS 336:2010, PN16 Rated and non-return valves. The breeching inlets to be manufatured to comply to BS 5041	1	No.		
D	**Hose reel pumps** Fire Booster set (2 No. Pumps), duty and standby complete with the following :- · 2 No. Automatic electrical motor driven fire water pumps with a capacity of 10 m^3/hr at 2 bar as **GRUNDFOS CR 10. or approved equivalent.** · Automatic electrical control panel as per specification for above pumps. · Base frame with anti-vibration mountings. · 100mm dial pressure gauge (0 - 10bar) · Pressure switch (double Pole) arrangement including flow switch and necessary valve and fittings. · 50mm diameter gate valve · 2 No. 50mm diameter Non-return valve · 50mm diameter line strainer, elbows, tees, unions, etc. Electrical connection from isolators to control panel and from control panel to the pump. Rates to allow for electric cabling and conduit.	1	Set		
E	Allow for painting the fire pipework to comply to relevant fire standards	1	Item		
F	**PORTABLE FIRE EXTINGUISHERS** 9 Litre water fire extinguishers complete with pressure gauge, initial charge and mounting brackets.	12	No.		
G	5 Kg carbon dioxide gas fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	8	No.		
H	4.5 Kg Dry Powder fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	12	No.		
	Total C/F to Summary Page				

BILL NO. 11:TOILET EXTRACTION SYSTEM

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	Supply, deliver and install, test and commission, the following equipment including their support brackets, screws, etc. and all connections and electrical power & control cabling:-				
A	In-line-duct toilet extraction axial fanof capacity 300 m3/h at 100 Pascals, at a speed 1584 rpm, and power rating of 02kW, 240V 1-phase, 50Hz complete with all accessories, electrical & control wiring between fan, power outlet, vibration isolators, matching flanges, Control Panel, flexible connectors, guard, bell mouth outlet, etc. Fan to be as Systemair K150XL SILWO equal and approved.	11	No.		
B	In-line-duct labair extraction axialfan -10 of capacity 800m3/h at 100 Pascals, at a speed 1584 rpm, and power rating of 0.3kW, 240V 1-phase, 50Hz complete with all accessories, electrical & control wiring between fan, power outlet, vibration isolators, matching flanges, Control Panel, flexible connectors, guard, bell mouth outlet, etc. Fan to be as Systemair equal and approved.	1	No.		
C	Axial extract fan of a capacity of 200m3/at 100 Pascals for the sluice room	4	No.		
	DUCTWORK				
D	Supply, and Fabricate Galvanised mild steel ductwork 22 SWG 0.8mm thick), complete with transformation pieces, joints, bracing, gaskets, supports, sleeves, stiffness, splitters, training vanes, test holes, mild steel access doors/hatches, and any other necessaries necessary for the complete laying of the ductwork.	120	SM		
	Flexible Ductwork				
E	150mm diameter glass fibre fabric on a PVC coated duct work.Duct to ha	50	LM		
F	300 X 300mm external weather louvres	12	No.		
G	125nn Extract Air Disc Valves	44	No.		
H	600 x 600 air registers	6	No.		
I	Allow for fabrication of volume contol dampers complete with accessories	1	Item		
I	Allow for Electrical Connections for Ventilation Fans from Local Isolators.	1	Item		
	Total C/F to Summary Page				

ITEM No.	BILL NO. 10:PIPEWORK FOR MEDICAL GASES AND FITTINGS DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	Supply and fix specially designed copper medical gas and vaccum system, kitemarked, stamped tube/fittings, degreased,bagged and capped, medical gas ID tape, metric pipe range, seamless one piece end fittings. Tenderers must allow in their pipework prices for all the couplings, unions, connectors, joints, etc. in running lengths of pipes and also where necessary for fixing clips, holderbats plugged and screwed.				
	The pipe MUST conform to all the relevant medical gas standards 9BS EN and HTM02-01) as indicated in section 4 of Part B of this document				
A	Medical gas Pipework				
	i) 15 mm ditto	168	LM.		
	ii) 22mm ditto	140	LM.		
	iii) 28mm ditto	80	LM.		
B	Tees				
	i) 15 mm ditto	12	No		
	ii) 22mm ditto	15	No		
	iii) 28mm ditto	8	No		
C	Elbows				
	i) 15 mm ditto	18	No		
	ii) 22mm ditto	16	No		
	iii) 28mm ditto	8	No		
D	Reducers				
	i) 22 x 15mm diameter reducer	12	No		
	ii) 28 x 22mm diameter reducer	6	No		
E	Medical gas isolation valves				
	i) 15 mm ditto	8	No		
	ii) 22mm ditto	6	No		
	iii) 28mm ditto	2	No		
	Total C/F to Summary Page				

BILL NO.10: GENERAL ITEMS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE KSH	AMOUNT
A	Allow for liaising and obtaining necessary licenses/permission and/or certificates from local authorities to complete works		Item		
B	Acquire and submit Insurance for the sub-contract work.		Item		
C	Allow for presentation of all the required samples as per specifications, Bills of Quantities and Drawings.		Item		
D	Allow for testing and commissioning of all plumbing, drainage & fire fighting installations as per Bills of quantities, specifications and drawings to the satisfaction of the Engineer.		Item		
E	Prepare and submit Working Drawings comprising the following to the satisfaction of the Engineer both in hard and soft copy. All drawings to be in Autocad® 2015 format or an approved higher version: - i) Fully dimensioned drawings of all plants and apparatus. ii) General arrangement drawings of equipment, plant etc. iii) Routes – types and sizes and arrangement of all pipe work. iv) Wiring and piping diagrams of plant and apparatus. v) Schematic diagram of individual plants and switch and control boards. vi) All the required operating instructions for all panels, boards, control panels etc.		Item		
F	As item no 10.06, but for Record (As-Installed)		Item		
G	Prepare and submit Maintenance Manuals for all items installed.		Item		
H	To ensure that materias are supplied to specifications, allow for factory visit for 2**No. persons** (Engineer/Architect) to visit the manufacturing factory to verify the specifications and witness all the relevant factory tests before approval of shipping is given.		Item		
	Total C/F to Summary Page				

UMMARY

ITEM NO.	DESCRIPTION				AMOUNT
1	Bill No. 1A - Sanitary fittings supply and fix B/F from Page 3				
2	Bill No. 2- - Cold water supply pipework B/F from Page 5				
3	Bill No. 3- Internal drainage pipework, B/F from Page 7				
4	Bill No. 4- Rainwater water downpipes, B/F from Page 7				
5	Bill No 5- Water pump set B/F from Page 9				
6	Bill No. 6- Water tanks B/F from Page 10				
7	Bill No.7 - Hot water generation and pipework B/F from Page 11				
8	Bill No 8- External water reticualation B/F from Page 12				
9	Bill No 8- External drainage B/F from Page 13				
10	Bill No 9- Hose reel and Dry riser B/F from Page 14				
11	Bill No. 9-Toilet Extraction B/F from Page 15				
12	Bill No. 9-Medical gas piping work (Provisional) B/F from Page 18				
13	Bill No. 10, Prelimaries B/F from Page 19				
	TOTALS				
	Allow for 2.5 % oTotal as Contingency				
	Total Carried to Form of Tender				

COUNTY GOVERNMENT OF BOMET

P.O BOX 19-20400 BOMET

THE PROPOSED CONSTRUCTION OF BOMET MOTHER AND CHILD WELLNESS CENTRE

TENDER DOCUMENT AND BILLS OF QUANTITIES

ELECTRICAL WORKS

PROJECT MANAGER
DIRECTOR OF PUBLIC WORKS- BOMET COUNTY

ARCHITECTS
COUNTY ARCHITECT- BOMET COUNTY.

ELECTRICAL ENGINEER
COUNTY ELECTRICAL SERVICES ENGINEERS

QUANTITY SURVEYORS
COUNTY QUANTITY SURVEYOR- BOMET COUNTY

MECHANICAL ENGINEER
COUNTY MECHANICAL SERVICES ENGINEERS

STRUCTURAL ENGEERER
COUNTY STRUCTURAL ENGINEER- BOMET COUNTY.

JULY, 2021

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT No.2 LIGHTING & SMALL POWER INSTALLATIONS				
	GROUND FLOOR				
	MAIN ENTRANCE				
	LIGHTING INSTALLATIONS				
A	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	20		
	Note:All switches as schneider to approval				
B	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	2		
	ii) One gang two way	No..	2		
	iii) Two gang one way	No..	1		
	Supply and install the following light fittings as detailed in our contract drawing:				
C	**Type DL:2**00mm Decorative round surface mounted IP20 LED Luminaire	No..	12		
D	**Type R3E :** Weather proof LED tube light with emergency kit	No..	1		
E	**Type EXIT:** 8W LED exit light with necessary directional indication	No..	1		
	SMALL POWER INSTALLATIONS				
F	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
G	Moulded socket outlet plates as MK range or approved equivalent as follows: i) 13A Twin switched (raw Power)	No..	2		
	BILLING AREAS				
	LIGHTING INSTALLATIONS				
H	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	9		
	Note:All switches as schneider to approval				
I	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	2		
	ii)One gang two way	No..	1		
J	Supply and install the following light fittings as detailed in our contract drawing: **Type DL:2**00mm Decorative round surface mounted IP20 LED Luminaire	No..	6		
	SMALL POWER INSTALLATIONS				
K	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	9		
L	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	6		
	ii) 13A Twin switched (Clean Power)	No..	3		
	PHARMANCY ROOM & CASHIER OFFICE				
	LIGHTING INSTALLATIONS				
M	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	12		
	Note:All switches as schneider to approval				
N	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	2		
	ii) One gang two way	No..	1		
	Supply and install the following light fittings as detailed in our contract drawing:				
O	**Type DL:**100mm Decorative round surface mounted IP20 LED Luminaire	No..	8		
P	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	1		
	SUB TOTAL CARRIEED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUB-TOTAL BROUGHT FROM PREVIOUS PAGE				
	SMALL POWER INSTALLATIONS				
A	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	6		
B	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	4		
	ii) 13A Twin switched (Clean Power)	No..	2		
	WAITING BAY AREA & CUSTOMER CARE **LIGHTING INSTALLATIONS**				
B	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	17		
	SUB TOTAL CARRIED TO COLLECTION PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	Note:All switches as schneider to approval				
A	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	3		
	ii) One gang two way	No..	2		
B	Supply and install the following light fittings as detailed in our contract drawing:				
	Type B: 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	12		
	SMALL POWER INSTALLATIONS				
C	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	5		
D	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	4		
	ii) 13A Twin switched (Clean Power)	No..	1		
	CONSULTATION ROOMS				
	LIGHTING INSTALLATIONS				
E	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	16		
	Note:All switches as schneider to approval				
F	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	4		
	Supply and install the following light fittings as detailed in our contract drawing:				
G	**Type DL:2**00mm Decorative round surface mounted IP20 LED Luminaire	No..	8		
H	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	4		
	SMALL POWER INSTALLATIONS				
I	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	8		
	Moulded socket outlet plates as MK range or approved equivalent as follows:				
J	13A Twin switched (raw Power)	No..	4		
K	13A Twin switched (Clean Power)	No..	4		
	IMUNIZATION ROOM				
	LIGHTING INSTALLATIONS				
L	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	5		
	Note:All switches as schneider to approval				
	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
M	One gang one way	No..	2		
	Supply and install the following light fittings as detailed in our contract drawing:				
N	**Type DL:**100mm Decorative round surface mounted IP20 LED Luminaire	No..	2		
O	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	1		
	SMALL POWER INSTALLATIONS				
P	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
	Moulded socket outlet plates as MK range or approved equivalent as follows:				
Q	13A Twin switched (raw Power)	No..	1		
R	13A Twin switched (Clean Power)	No..	1		
	SUB TOTAL CARRIEED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUB-TOTAL BROUGHT FROM PREVIOUS PAGE				
	COMMUNITY ROOM				
	LIGHTING INSTALLATIONS				
A	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	6		
	Note:All switches as schneider to approval				
	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
B	**i)** One gang one way	No..	3		
	Supply and install the following light fittings as detailed in our contract drawing:				
C	**Type DL:**100mm Decorative round surface mounted IP20 LED Luminaire	No..	2		
D	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	1		
	SUB TOTAL CARRIED TO COLLECTION PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SMALL POWER INSTALLATIONS				
A	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
B	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	1		
	ii) 13A Twin switched (Clean Power)	No..	1		
	GENTS CHANGE ROOM				
	LIGHTING INSTALLATIONS				
C	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	6		
	Note:All switches as schneider to approval				
D	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang two way	No..	2		
E	Supply and install the following light fittings as detailed in our contract drawing:				
	Type D4: 200mm diameter round Recesssed/surface mounted downlight	No..	4		
	SMALL POWER INSTALLATIONS				
F	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	1		
G	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	1		
H	Radial Circuits wired for 20A DP switch for Hand Drier points comprising wiring in				
	3x2.5mm sq. PVC/SC CU cables drawn in 20mm Φ concealed HG PVC conduits including all conduit accessories.	No..	1		
I	Supply and install 20A double pole switch for Hand Dyer Point	No..	1		
	LADIES CHANGE ROOM				
	LIGHTING INSTALLATIONS				
J	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	6		
	Note:All switches as schneider to approval				
K	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang two way	No..	2		
L	Supply and install the following light fittings as detailed in our contract drawing:				
	Type D4: 200mm diameter round Recesssed/surface mounted downlight	No..	4		
	SMALL POWER INSTALLATIONS				
M	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	1		
N	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	1		
O	Radial Circuits wired for 20A DP switch for Hand Drier points comprising wiring in				
	3x2.5mm sq. PVC/SC CU cables drawn in 20mm Φ concealed HG PVC conduits including all conduit accessories.	No..	1		
P	Supply and install 20A double pole switch for Hand Dyer Point	No..	1		
	SUB TOTAL CARRIEED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUB-TOTAL BROUGHT FROM PREVIOUS PAGE				
	LEFT WING LOBBY & STAIRCASE				
	LIGHTING INSTALLATIONS				
A	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	14		
	Note:All switches as schneider to approval				
B	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..	1		
C	Supply and install the following light fittings as detailed in our contract drawing:				
i	**Type D:** 100mm diameter round Recesssed/surface mounted downlight	No..	6		
ii	**Type K1;** Surfaxe mount 12W LED light for staircase as circular or approved equivalent.	No..	2		
iii	**Type EXIT:** 8W LED exit light with necessary directional indication	No..	1		
iv	**Type DE:2**00mm diameter round Recesssed/surface mounted downlight with Emergency Kit	No..	1		
	SUB TOTAL CARRIED TO COLLECTION PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SMALL POWER INSTALLATIONS				
A	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
B	Moulded socket outlet plates as MK range or approved equivalent as follows: i) 13A Twin switched (raw Power)	No..	2		
	DUTY 01 & 02 ROOMS				
	LIGHTING INSTALLATIONS				
C	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	7		
	Note:All switches as schneider to approval				
D	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	2		
E	Supply and install the following light fittings as detailed in our contract drawing: **Type D: 2**00mm diameter round Recesssed/surface mounted downlight	No..	4		
	SMALL POWER INSTALLATIONS				
F	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
G	Moulded socket outlet plates as MK range or approved equivalent as follows: i) 13A Twin switched (raw Power)	No..	2		
	WASH ROOMS				
	LIGHTING INSTALLATIONS				
H	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	16		
	Note:All switches as schneider to approval				
I	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	4		
	Supply and install the following light fittings as detailed in our contract drawing:				
J	**Type D: 2**00mm diameter round Recesssed/surface mounted downlight LED	No..	9		
K	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	2		
	SMALL POWER INSTALLATIONS				
L	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
M	Moulded socket outlet plates as MK range or approved equivalent as follows: i) 13A Twin switched (raw Power)	No..	2		
N	Radial Circuits wired for 20A DP switch for Hand Drier points comprising wiring in 3x2.5mm sq. PVC/SC CU cables drawn in 20mm Φ concealed HG PVC conduits including all conduit accessories.	No..	2		
O	Supply and install 20A double pole switch for Hand Dyer Point	No..	2		
	CORRIDOR AREA				
	LIGHTING INSTALLATIONS				
P	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	21		
	SUB TOTAL CARRIEED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUB-TOTAL BROUGHT FROM PREVIOUS PAGE				
	Note:All switches as schneider to approval				
A	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	3		
	iii Two gang one way	No..	1		
	Supply and install the following light fittings as detailed in our contract drawing:				
B	**Type B:** 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	12		
C	**Type D: 2**00mm diameter round Recesssed/surface mounted downlight	No..	4		
	SMALL POWER INSTALLATIONS				
D	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	5		
E	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	4		
	ii) 13A Twin switched (Clean Power)	No..	1		
	SUB TOTAL CARRIED TO COLLECTION PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	CAUSALITY DROP-OFF POINT				
	LIGHTING INSTALLATIONS				
A	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	7		
	Note:All switches as schneider to approval				
B	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	2		
C	Supply and install the following light fittings as detailed in our contract drawing:				
	Type B: 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	4		
	SMALL POWER INSTALLATIONS				
D	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	1		
E	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	1		
	CAUSALITY ROOM				
	LIGHTING INSTALLATIONS				
F	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	9		
	Note:All switches as schneider to approval				
G	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	2		
	Supply and install the following light fittings as detailed in our contract drawing:				
H	**Type B:** 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	6		
	SMALL POWER INSTALLATIONS				
J	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø				
I	concealed HG PVC conduits including all conduit accessories but excluding plates	No..	7		
J	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	5		
	ii) 13A Twin switched (Clean Power)	No..	2		
	NURSE STATION,DUTY & NURSE INCHARGE ROOMS				
	LIGHTING INSTALLATIONS				
K	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	8		
	Note:All switches as schneider to approval				
L	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	3		
	Supply and install the following light fittings as detailed in our contract drawing:				
M	**Type DL:2**00mm Decorative round surface mounted IP20 LED Luminaire	No..	3		
N	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	1		
	SUB TOTAL CARRIEED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUB-TOTAL BROUGHT FROM PREVIOUS PAGE				
	SMALL POWER INSTALLATIONS				
A	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	4		
B	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	3		
	ii) 13A Twin switched (Clean Power)	No..	1		
	SLUICE ROOM				
	LIGHTING INSTALLATIONS				
C	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	9		
	Note:All switches as schneider to approval				
D	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..			
	ii) One gang two way	No..	2		
	Supply and install the following light fittings as detailed in our contract drawing:				
E	**Type D4: 2**00mm diameter round Recesssed/surface mounted downlight	No..	6		
F	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	1		
	SUB TOTAL CARRIED TO COLLECTION PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SMALL POWER INSTALLATIONS				
A	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
	X-RAY ROOM				
	LIGHTING INSTALLATIONS				
B	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	9		
	Note:All switches as schneider to approval				
C	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
D	**Type DL:2**00mm Decorative round surface mounted IP20 LED Luminaire	No..	4		
E	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	1		
	SMALL POWER INSTALLATIONS				
F	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	3		
G	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	2		
	ii) 13A Twin switched (Clean Power)	No..	1		
H	Radial Circuits wired for 40A Industrail Isolator for Equipment power points comprising wiring in				
	4C x 16mm SC CU cables drawn in 32mm Φ concealed HG PVC conduits including all conduit accessories.	LM	30		
I	40A TP Isolator as Katco or approved equivalent	No..	1		
	ULTRA SOUND ROOM				
	LIGHTING INSTALLATIONS				
J	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	8		
	Note:All switches as schneider to approval				
K	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
L	**Type DL:2**00mm Decorative round surface mounted IP20 LED Luminaire	No..	4		
M	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	1		
	SUB TOTAL CARRIEED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUB-TOTAL BROUGHT FROM PREVIOUS PAGE				
	SMALL POWER INSTALLATIONS				
A	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	4		
B	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	3		
	ii) 13A Twin switched (Clean Power)	No..	1		
C	Radial Circuits wired for 40A Industrail Isolator for Equipment power points comprising wiring in				
	4C x 16mm SC CU cables drawn in 32mm Φ concealed HG PVC conduits including all conduit accessories.	LM	15		
D	40A TP Isolator as Katco or approved equivalent	No..	1		
	CONTROL ROOMS				
	LIGHTING INSTALLATIONS				
E	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	15		
	Note:All switches as schneider to approval				
F	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	2		
	ii) One gang two way	No..	4		
	iii Two gang one way	No..	1		
G	Supply and install the following light fittings as detailed in our contract drawing:	No..	6		
H	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	2		
	SUB TOTAL CARRIED TO COLLECTION PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SMALL POWER INSTALLATIONS				
A	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	6		
B	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	ii) 13A Twin switched (raw Power)	No..	4		
	iii) 13A Twin switched (Clean Power)	No..	2		
	MRI SCAN ROOM				
	LIGHTING INSTALLATIONS				
C	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	10		
	Note:All switches as schneider to approval				
D	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	2		
	ii) One gang two way	No..	2		
	Supply and install the following light fittings as detailed in our contract drawing:				
E	**Type DL:2**00mm Decorative round surface mounted IP20 LED Luminaire	No..	4		
F	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	2		
	SMALL POWER INSTALLATIONS				
G	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	5		
H	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	3		
	ii) 13A Twin switched (Clean Power)	No..	2		
	Radial Circuits wired for 40A Industrail Isolator for Equipment power points comprising wiring in				
I	4C x 16mm SC CU cables drawn in 32mm Φ concealed HG PVC conduits including all conduit accessories.	LM	30		
J	40A TP Isolator as Katco or approved equivalent	No..	1		
	CT SCAN ROOM				
	LIGHTING INSTALLATIONS				
K	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	10		
	Note:All switches as schneider to approval				
L	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	2		
	ii) One gang two way	No..	2		
	Supply and install the following light fittings as detailed in our contract drawing:				
M	**Type DL: 2**00mm Decorative round surface mounted IP20 LED Luminaire	No..	4		
N	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	2		
	SMALL POWER INSTALLATIONS				
O	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	4		
P	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	2		
	ii) 13A Twin switched (Clean Power)	No..	2		
	SUB TOTAL CARRIEED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUB-TOTAL BROUGHT FROM PREVIOUS PAGE				
A	Radial Circuits wired for 40A Industrail Isolator for Equipment power points comprising wiring in 4C x 16mm SC CU cables drawn in 32mm Φ concealed HG PVC conduits including all conduit accessories.	LM	30		
B	40A TP Isolator as Katco or approved equivalent	No..	1		
	LAB & TB LAB ROOM				
	LIGHTING INSTALLATIONS				
C	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	15		
	Note:All switches as schneider to approval				
D	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	3		
	ii) One gang two way	No..	2		
	Supply and install the following light fittings as detailed in our contract drawing:				
E	Type DL:100mm Decorative round surface mounted IP20 LED Luminaire	No..	8		
F	Type ML: Recesssed 3W Swivel type LED spot light as mirror light	No..	2		
	SUB TOTAL CARRIED TO COLLECTION PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SMALL POWER INSTALLATIONS				
A	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	6		
B	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	4		
	ii) 13A Twin switched (Clean Power)	No..	2		
	Radial Circuits wired for 40A Industrail Isolator for Equipment power points comprising wiring in				
C	4C x 16mm SC CU cables drawn in 32mm Φ concealed HG PVC conduits including all conduit accessories.	LM	25		
D	40A TP Isolator as Katco or approved equivalent	No..	1		
	COMMON STAFF ROOM				
	LIGHTING INSTALLATIONS				
E	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	7		
	Note:All switches as schneider to approval				
F	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	2		
G	Supply and install the following light fittings as detailed in our contract drawing:				
i	**Type B:** 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	4		
	SMALL POWER INSTALLATIONS				
H	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	5		
I	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	3		
	ii) 13A Twin switched (Clean Power)	No..	2		
	RADIOLOGIST & SERVER ROOM				
	LIGHTING INSTALLATIONS				
I	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	10		
	Note:All switches as schneider to approval				
J	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	2		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
K	**Type B:** 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	6		
	SMALL POWER INSTALLATIONS				
L	concealed HG PVC conduits including all conduit accessories but excluding plates	No..	10		
M	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Single switched (water proof)	No..			
	ii) 13A Twin switched (raw Power)	No..	6		
	iii) 13A Twin switched (Clean Power)	No..	4		
	SAMPLE COLLECTION ROOM				
	LIGHTING INSTALLATIONS				
N	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	6		
	SUB TOTAL CARRIEED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUB-TOTAL BROUGHT FROM PREVIOUS PAGE				
	Note:All switches as schneider to approval				
A	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	2		
B	Supply and install the following light fittings as detailed in our contract drawing:				
i	**Type DL:2**00mm Decorative round surface mounted IP20 LED Luminaire	No..	4		
	SMALL POWER INSTALLATIONS				
C	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
D	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	2		
	SUB TOTAL CARRIED TO COLLECTION PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	COMMON WAITING BAY				
	LIGHTING INSTALLATIONS				
A	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	3		
	Note:All switches as schneider to approval				
B	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	1		
	Supply and install the following light fittings as detailed in our contract drawing:				
C	**Type B:** 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	2		
	SMALL POWER INSTALLATIONS				
D	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
E	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	2		
	PATIENT PREP. ROOM				
	LIGHTING INSTALLATIONS				
F	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	3		
	Note:All switches as schneider to approval				
G	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	1		
	Supply and install the following light fittings as detailed in our contract drawing:				
H	**Type DL:2**00mm Decorative round surface mounted IP20 LED Luminaire	No..	1		
	SMALL POWER INSTALLATIONS				
I	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	1		
J	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	1		
	GENTS CHANGE ROOM				
	LIGHTING INSTALLATIONS				
K	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	4		
	Note:All switches as schneider to approval				
L	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang two way	No..	1		
	Supply and install the following light fittings as detailed in our contract drawing:				
M	**Type D4: 200mm diameter round** Recesssed/surface mounted downlight	No..	3		
	SMALL POWER INSTALLATIONS				
N	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	1		
O	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	1		
	SUB TOTAL CARRIEED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUB-TOTAL BROUGHT FROM PREVIOUS PAGE				
	Radial Circuits wired for 20A DP switch for Hand Drier points comprising wiring in				
A	3x2.5mm sq. PVC/SC CU cables drawn in 20mm Φ concealed HG PVC conduits including all conduit accessories.	No..	1		
B	Supply and install 20A double pole switch for Hand Dyer Point	No..	1		
	LADIES CHANGE ROOM				
	LIGHTING INSTALLATIONS				
C	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	4		
	Note:All switches as schneider to approval				
D	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..			
	ii) One gang two way	No..	1		
	iii Two gang one way	No..			
	SUB TOTAL CARRIED TO COLLECTION PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	Supply and install the following light fittings as detailed in our contract drawing:				
	Type D4: 200mm diameter round Recesssed/surface mounted downlight	No..	3		
	SMALL POWER INSTALLATIONS				
B	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø				
	concealed HG PVC conduits including all conduit accessories but excluding plates	No..	1		
C	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	1		
D	Radial Circuits wired for 20A DP switch for Hand Drier points comprising wiring in				
	3x2.5mm sq. PVC/SC CU cables drawn in 20mm Φ concealed HG PVC conduits including all				
	conduit accessories.	No..	1		
E	Supply and install 20A double pole switch for Hand Dyer Point	No..	1		
	RIGHT WING LOBBY & STAIRCASE				
	LIGHTING INSTALLATIONS				
F	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables				
	drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø				
	high impact heavy gauge PVC conduits complete with required accessories.	No..	12		
	Note:All switches as schneider to approval				
G	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..	1		
	Supply and install the following light fittings as detailed in our contract drawing:				
I	**Type D:** 100mm diameter round Recesssed/surface mounted downlight	No..	4		
J	**Type K1;** Surfaxe mount 12W LED light for staircase as circular or approved equivalent.	No..	2		
K	**Type EXIT:** 8W LED exit light with necessary directional indication	No..	1		
L	**Type DE:2**00mm diameter round Recesssed/surface mounted downlight with Emergency Kit	No..	1		
	SMALL POWER INSTALLATIONS				
M	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø				
	concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
N	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	ii) 13A Twin switched (raw Power)	No..	2		
	BACK LOBBY, RAMP & STAIRCASE				
	LIGHTING INSTALLATIONS				
O	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables				
	drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø				
	high impact heavy gauge PVC conduits complete with required accessories.	No..	15		
	Note:All switches as schneider to approval				
O	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	2		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..	1		
P	Supply and install the following light fittings as detailed in our contract drawing:				
	Type D: 100mm diameter round Recesssed/surface mounted downlight	No..	6		
Q	**Type K1;** Surfaxe mount 12W LED light for staircase as circular or approved equivalent.	No..	3		
R	**Type EXIT:** 8W LED exit light with necessary directional indication	No..	1		
S	**Type DE:**100mm diameter round Recesssed/surface mounted downlight with Emergency Kit	No..	1		
	SUB TOTAL CARRIEED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUB-TOTAL BROUGHT FROM PREVIOUS PAGE				
	SMALL POWER INSTALLATIONS				
A	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
B	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	2		
	EXTERNAL LIGHTING				
	LIGHTING INSTALLATIONS				
C	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	16		
	Lighting points wired in 3x1.5 mm PVC/SC CU cables drawn in 20 mm Ø concealed HG PVC				
D	**conduits complete with all necessary accessories but excluding switches for:**				
	i) One way switching	No..	6		
	ii) Two way with intermediate switching	No..	4		
	iii) Photocell./timercontrol	No..	6		
E	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	8		
	ii) Photocell./timercontrol	No..	6		
	SUB TOTAL CARRIED TO COLLECTION PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SERVICE DUCT				
	LIGHTING INSTALLATIONS				
A	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories. **Note:All switches as schneider to approval**	No..	8		
B	Supply and install the following light fittings as detailed in our contract drawing: **Type B**: LED light	No..	8		
	GROUND FLOOR				
C	TV/Fire Alarm/Data/Voice/Speaker/ICT/CCTV/Access control point complete with Draw wire in concealed 25mm HG PVC conduits in the Ground Floor connected to the Data Riser Duct the cables to the Ground Floor	No..	118		
D	Allow for testing and commissioning for lightning & small Power installations.	No.	1		
	SUB TOTAL CARRIED TO COLLECTION PAGE	KSHS.			
	COLLECTION				
1	SUB- TOTAL BROUGHT FROM PAGE GF/MCC/ 2				
2	SUB- TOTAL BROUGHT FROM PAGE GF/MCC/ 4				
3	SUB- TOTAL BROUGHT FROM PAGE GF/MCC/ 6				
4	SUB- TOTAL BROUGHT FROM PAGE GF/MCC/ 8				
5	SUB- TOTAL BROUGHT FROM PAGE GF/MCC/ 10				
6	SUB- TOTAL BROUGHT FROM PAGE GF/MCC/ 12				
7	SUB- TOTAL BROUGHT FROM PAGE GF/MCC/ 14				
8	SUB- TOTAL BROUGHT FROM PAGE GF/MCC/ 16				
9	SUB- TOTAL BROUGHT FROM PAGE GF/MCC/ 18				
10	SUB- TOTAL BROUGHT FROM PAGE GF/MCC/ 20				
11	SUB- TOTAL BROUGHT FROM PAGE GF/MCC/ 21				
	GRAND TOTAL FOR GROUND FLOOR CARRIED TO SUMMARRY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT No.2 LIGHTING & SMALL POWER INSTALLATIONS				
	FIRST FLOOR				
	ENTRANCE LOBBY, RAMP & STAIRCASE				
	LIGHTING INSTALLATIONS				
A	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	15		-
	Note:All switches as schneider to approval				
B	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..	1		
	Supply and install the following light fittings as detailed in our contract drawing:				
C	**Type D:** 200mm diameter round Recesssed/surface mounted downlight	No..	6		
D	Type K1; Surfaxe mount 12W LED light for staircase as circular or approved equivalent.	No..	3		
E	**Type EXIT:** 8W LED exit light with necessary directional indication	No..	1		
F	**Type DE:**200mm diameter round Recesssed/surface mounted downlight with Emergency Kit	No..	1		
	SMALL POWER INSTALLATIONS				
G	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
H	Moulded socket outlet plates as MK range or approved equivalent as follows: i) 13A Twin switched (raw Power)	No..	2		
	WASH ROOMS(AIRLOCK ROOMS)				
	LIGHTING INSTALLATIONS				
I	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	14		
J	**Note:All switches as schneider to approval**				
	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	4		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
K	**Type D:** 200mm diameter round Recesssed/surface mounted downlight LED	No..	6		
L	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	3		
	SMALL POWER INSTALLATIONS				
M	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
N	Moulded socket outlet plates as MK range or approved equivalent as follows: **i) 13A Twin switched (raw Power)**	No..	2		
O	Radial Circuits wired for 20A DP switch for Hand Drier points comprising wiring in 3x2.5mm sq. PVC/SC CU cables drawn in 20mm Φ concealed HG PVC conduits including all conduit accessories.	No..	2		
P	**Supply and install 20A double pole switch for Hand Dyer Point**	No..	2		
	ANTE ROOM & TROLLEY BAY				
	LIGHTING INSTALLATIONS				
Q	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø** high impact heavy gauge PVC conduits complete with required accessories.	No..	8		
	Note:All switches as schneider to approval				
R	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..			
S	Supply and install the following light fittings as detailed in our contract drawing: Type B: 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	5		
	SMALL POWER INSTALLATIONS				
T	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates**	No..	2		
U	Moulded socket outlet plates as MK range or approved equivalent as follows: i) 13A Twin switched (raw Power)	No..	2		
	SUB TOTAL CARRIED TO COLLECTION PAGE	KSHS.			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	GENTS CHANGE ROOM				
	LIGHTING INSTALLATIONS				
A	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.**	No..	4		
	Note:All switches as schneider to approval				
B	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..			
	ii) One gang two way	No..	1		
	iii Two gang one way	No..			
C	Supply and install the following light fittings as detailed in our contract drawing:				
	Type D4: 200mm diameter round Recesssed/surface mounted downlight	No..	3		
	SMALL POWER INSTALLATIONS				
D	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	1		
E	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	1		
F	Radial Circuits wired for 20A DP switch for Hand Drier points comprising wiring in conduit accessories.	No..	1		
G	**Supply and install 20A double pole switch for Hand Dyer Point**	No..	1		
	LADIES CHANGE ROOM				
	LIGHTING INSTALLATIONS				
H	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables** drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø **high impact heavy gauge PVC conduits complete with required accessories.**	No..	9		
	Note:All switches as schneider to approval				
J	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..			
	ii) One gang two way	No..	1		
	iii Two gang one way	No..			
K	Supply and install the following light fittings as detailed in our contract drawing:				
	Type D4: 200mm diameter round Recesssed/surface mounted downlight	No..	3		
	SMALL POWER INSTALLATIONS				
	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø				
L	concealed HG PVC conduits including all conduit accessories but excluding plates	No..	1		
M	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	1		
N	**Radial Circuits wired for 20A DP switch for Hand Drier points comprising wiring in** 3x2.5mm sq. PVC/SC CU cables drawn in 20mm Φ concealed HG PVC conduits including all conduit accessories.	No..	1		
O	**Supply and install 20A double pole switch for Hand Dyer Point**	No..	1		
	SCRUB ROOM				
	LIGHTING INSTALLATIONS				
P	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø** high impact heavy gauge PVC conduits complete with required accessories.	No..	3		
	Note:All switches as schneider to approval				
Q	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..			
	ii) One gang two way	No..	1		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
R	Type D4: 200mm diameter round Recesssed/surface mounted downlight	No..	2		
	SMALL POWER INSTALLATIONS				
S	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø **concealed HG PVC conduits including all conduit accessories but excluding plates**	No..	1		
T	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	1		
	SUB TOTAL CARRIED TO COLLECTION PAGE	KSHS.			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	STERILIZATION ROOM				
	LIGHTING INSTALLATIONS				
A	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.**	No..	7		
	Note:All switches as schneider to approval				
B	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..			
C	Supply and install the following light fittings as detailed in our contract drawing:				
	Type B: 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	2		
	Type ML: Recesssed 3W Swivel type LED spot light as mirror light	No..	1		
	Type R3E : Weather proof LED tube light with emergency kit	No..	1		
	SMALL POWER INSTALLATIONS				
D	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	3		
E	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	2		
	ii) 13A Twin switched (Clean Power)	No..	1		
F	**Radial Circuits wired for 40A Industrail Isolator for Equipment power points comprising wiring in 4C x 16mm SC CU cables drawn in 32mm Φ concealed HG PVC conduits including all conduit** accessories.	LM	25		
G	**40A TP Isolator as Katco or approved equivalent**	No..	1		
	OPERATION/THEATRE ROOM				
	LIGHTING INSTALLATIONS				
H	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	14		
	Note:All switches as schneider to approval				
I	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	2		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
	Type B: 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	4		
J	Type S; Special Theater Light, lamp holder c/w neceessary accessories,	No..	3		
K	Type ML: Recesssed 3W Swivel type LED spot light as mirror light	No..	2		
L	**Type R3E :** Weather proof LED tube light with emergency kit	No..	1		
	SMALL POWER INSTALLATIONS				
M	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates**	No..	6		
N	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	4		
	ii) 13A Twin switched (Clean Power)	No..	2		
O	**Radial Circuits wired for 40A Industrail Isolator for Equipment power points comprising wiring in 4C x 16mm SC CU cables drawn in 32mm Φ concealed HG PVC conduits including all conduit** accessories.	LM	30		
P	40A TP Isolator as Katco or approved equivalent	No..	1		
	RECOVERY ROOM				
	LIGHTING INSTALLATIONS				
Q	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	8		
	Note:All switches as schneider to approval				
R	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..			
S	Supply and install the following light fittings as detailed in our contract drawing:				
	Type B: 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	4		
	Type R3E : Weather proof LED tube light with emergency kit	No..	1		
	SUB TOTAL CARRIED TO COLLECTION PAGE	KSHS.			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SMALL POWER INSTALLATIONS				
A	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø**				
	concealed HG PVC conduits including all conduit accessories but excluding plates	No..	8		
B	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	6		
	ii) 13A Twin switched (Clean Power)	No..	2		
	NURSE STATION ROOM				
	LIGHTING INSTALLATIONS				
C	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables**				
	drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø				
	high impact heavy gauge PVC conduits complete with required accessories.	No..	7		
A					
	Note:All switches as schneider to approval				
	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
B	i) One gang one way	No..	1		
	ii) One gang two way	No..	1		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
C	Type DL:200mm Decorative round surface mounted IP20 LED Luminaire	No..	4		
	Type ML: Recesssed 3W Swivel type LED spot light as mirror light	No..	1		
	SMALL POWER INSTALLATIONS				
D	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø**				
	concealed HG PVC conduits including all conduit accessories but excluding plates	No..	5		
E	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	2		
	ii) 13A Twin switched (Clean Power)	No..	1		
	LABOUR WARD 01				
	LIGHTING INSTALLATIONS				
F	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables				
	drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø				
	high impact heavy gauge PVC conduits complete with required accessories.	No..	20		
	Note:All switches as schneider to approval				
G	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	2		
	ii) One gang two way	No..	3		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
H	**Type B:** 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	15		
I	**Type R3E :** Weather proof LED tube light with emergency kit	No..	2		
	SMALL POWER INSTALLATIONS				
J	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø**				
	concealed HG PVC conduits including all conduit accessories but excluding plates	No..	20		
K	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	14		
	ii) 13A Twin switched (Clean Power)	No..	6		
	NURSE STATION ROOM				
	LIGHTING INSTALLATIONS				
L	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables				
	drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø				
	high impact heavy gauge PVC conduits complete with required accessories.	No..	8		
	Note:All switches as schneider to approval				
M	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	2		
	ii) One gang two way	No..	1		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
N	Type DL:200mm Decorative round surface mounted IP20 LED Luminaire	No..	4		
O	Type ML: Recesssed 3W Swivel type LED spot light as mirror light	No..	1		
	SUB TOTAL CARRIED TO COLLECTION PAGE	KSHS.			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SMALL POWER INSTALLATIONS				
A	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates**	No..	3		
B	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	2		
	ii) 13A Twin switched (Clean Power)	No..	1		
	ICU ROOM				
	LIGHTING INSTALLATIONS				
C	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables** drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	9		
	Note:All switches as schneider to approval				
D	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	2		
	ii) One gang two way	**No..**	**1.00**		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
E	Type DL:200mm Decorative round surface mounted IP20 LED Luminaire	No..	4		
F	Type ML: Recesssed 3W Swivel type LED spot light as mirror light	No..	1		
G	**Type R3E :** Weather proof LED tube light with emergency kit	No..	1		
	SMALL POWER INSTALLATIONS				
H	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates**	No..	4		
I	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	2		
	ii) 13A Twin switched (Clean Power)	No..	2		
	LABOUR WARD WASH ROOMS				
	LIGHTING INSTALLATIONS				
J	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	10		
	Note:All switches as schneider to approval				
K	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	1		
	iii Two gang one way	No..	1		
	Supply and install the following light fittings as detailed in our contract drawing:				
L	**Type D4: 200mm diameter round** Recesssed/surface mounted downlight	No..	6		
M	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	1		
	SMALL POWER INSTALLATIONS				
N	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates**	No..	2		
O	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	2		
P	Radial Circuits wired for 20A DP switch for Hand Drier points comprising wiring in 3x2.5mm sq. PVC/SC CU cables drawn in 20mm Φ concealed HG PVC conduits including all conduit accessories.	No..	1		
Q	Supply and install 20A double pole switch for Hand Dyer Point	No..	1		
	LABOUR WARD 02				
	LIGHTING INSTALLATIONS				
R	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	21		
	Note:All switches as schneider to approval				
T	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	2		
	ii) One gang two way	No..	3		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
U	**Type B:** 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	14		
V	**Type R3E :** Weather proof LED tube light with emergency kit	No..	2		
	SUB TOTAL CARRIED TO COLLECTION PAGE	KSHS.			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SMALL POWER INSTALLATIONS				
A	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	18		
B	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	12		
	ii) 13A Twin switched (Clean Power)	No..	6		
	LEFT WING LOBBY & STAIRCASE				
	LIGHTING INSTALLATIONS				
C	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø **high impact heavy gauge PVC conduits complete with required accessories.**	No..	16		
	Note:All switches as schneider to approval				
D	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..	1		
	Supply and install the following light fittings as detailed in our contract drawing:				
E	Type K1; Surfaxe mount 12W LED light for staircase as circular or approved equivalent.	No..	4		
F	Type EXIT: 8W LED exit light with necessary directional indication	No..	1		
G	Type DE:200mm diameter round Recesssed/surface mounted downlight with Emergency Kit	No..	1		
H	**Type W:** Decorative Wall Bracket Lighting Points compete with Lamp holder as LED.	No..	4		
	SMALL POWER INSTALLATIONS				
I	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
J	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	ii) 13A Twin switched (raw Power)	No..	2		
	RIGHT WING LOBBY & STAIRCASE				
	LIGHTING INSTALLATIONS				
K	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables** drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø **high impact heavy gauge PVC conduits complete with required accessories.**	No..	16		
	Note:All switches as schneider to approval				
L	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..	1		
	Supply and install the following light fittings as detailed in our contract drawing:				
M	Type K1; Surfaxe mount 12W LED light for staircase as circular or approved equivalent.	No..	4		
N	Type EXIT: 8W LED exit light with necessary directional indication	No..	1		
0	Type DE:200mm diameter round Recesssed/surface mounted downlight with Emergency Kit	No..	1		
P	Type W: Decorative Wall Bracket Lighting Points compete with Lamp holder as LED.	No..	4		
	SMALL POWER INSTALLATIONS				
Q	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
R	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	ii) 13A Twin switched (raw Power)	No..	2		
	GENTS CHANGE ROOM				
	LIGHTING INSTALLATIONS				
S	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.**	No..	6		
	Note:All switches as schneider to approval				
T	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	1		
	iii Two gang one way	No..			
U	**Supply and install the following light fittings as detailed in our contract drawing:**				
	Type D4: 200mm diameter round Recesssed/surface mounted downlight	No..	4		
	SUB TOTAL CARRIED TO COLLECTION PAGE	KSHS.			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SMALL POWER INSTALLATIONS				
A	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	1		
B	Moulded socket outlet plates as MK range or approved equivalent as follows: i) 13A Twin switched (raw Power)	No..	1		
C	Radial Circuits wired for 20A DP switch for Hand Drier points comprising wiring in 3x2.5mm sq. PVC/SC CU cables drawn in 20mm Φ concealed HG PVC conduits including all conduit accessories.	No..	1		
D	Supply and install 20A double pole switch for Hand Dyer Point	No..	1		
	LADIES CHANGE ROOM				
	LIGHTING INSTALLATIONS				
E	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	7		
	Note:All switches as schneider to approval				
F	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..			
	ii) One gang two way	No..	2		
	iii Two gang one way	No..			
G	**Supply and install the following light fittings as detailed in our contract drawing:**				
	Type D4: 200mm diameter round Recesssed/surface mounted downlight	No..	5		
	SMALL POWER INSTALLATIONS				
H	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø** concealed HG PVC conduits including all conduit accessories but excluding plates	No..	1		
I	Moulded socket outlet plates as MK range or approved equivalent as follows: i) 13A Twin switched (raw Power)	No..	1		
J	Radial Circuits wired for 20A DP switch for Hand Drier points comprising wiring in 3x2.5mm sq. PVC/SC CU cables drawn in 20mm Φ concealed HG PVC conduits including all **conduit accessories.**	No..	1		
K	Supply and install 20A double pole switch for Hand Dyer Point	No..	1		
	LABOUR WARDS (SICK ROOM)				
	LIGHTING INSTALLATIONS				
L	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.**	No..	12		
	Note:All switches as schneider to approval				
M	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	2		
	ii) One gang two way	No..	4		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
N	Type B: 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	4		
O	**Type R3E :** Weather proof LED tube light with emergency kit	No..	1		
	SMALL POWER INSTALLATIONS				
P	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	14		
Q	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	10		
	ii) 13A Twin switched (Clean Power)	No..	4		
	SUB TOTAL CARRIED TO COLLECTION PAGE	KSHS.			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SLUICE ROOM				
	LIGHTING INSTALLATIONS				
A	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	8		
	Note:All switches as schneider to approval				
B	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..			
	ii) One gang two way	No..	2		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
C	**Type D4: 2**00mm diameter round Recesssed/surface mounted downlight	No..	4		
D	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	2		
	SMALL POWER INSTALLATIONS				
E	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
	ADMISSION AREA & NURSE STATION				
	LIGHTING INSTALLATIONS				
F	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	12		
	Note:All switches as schneider to approval				
G	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	3		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
H	Type DL:200mm Decorative round surface mounted IP20 LED Luminaire	No..	8		
I	Type ML: Recesssed 3W Swivel type LED spot light as mirror light	No..	1		
	SMALL POWER INSTALLATIONS				
J	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates**	No..	8		
K	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	2		
	ii) 13A Twin switched (Clean Power)	No..	2		
	BACK LOBBY, RAMP & STAIRCASE				
	LIGHTING INSTALLATIONS				
L	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	18		
	Note:All switches as schneider to approval				
M	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	2		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..	1		
	Supply and install the following light fittings as detailed in our contract drawing:				
N	Type D: 200mm diameter round Recesssed/surface mounted downlight	No..	6		
O	**Type K1;** Surfaxe mount 12W LED light for staircase as circular or approved equivalent.	No..	3		
P	**Type EXIT:** 8W LED exit light with necessary directional indication	No..	1		
Q	Type DE:200mm diameter round Recesssed/surface mounted downlight with Emergency Kit	No..	1		
	SMALL POWER INSTALLATIONS				
R	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø **concealed HG PVC conduits including all conduit accessories but excluding plates**	No..	3		
S	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	ii) 13A Twin switched (raw Power)	No..	3		
	SUB TOTAL CARRIED TO COLLECTION PAGE	KSHS.			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	CORRIDOR & PASSAGE				
	LIGHTING INSTALLATIONS				
A	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø** high impact heavy gauge PVC conduits complete with required accessories.	No..	26		
	Note:All switches as schneider to approval				
B	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	4		
	iii Two gang one way	No..	1		
	Supply and install the following light fittings as detailed in our contract drawing:				
C	Type B: 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	24		
D	**Type R3E :** Weather proof LED tube light with emergency kit	No..	1		
	SMALL POWER INSTALLATIONS				
E	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates**	No..	5		
F	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	4		
	iii) 13A Twin switched (Clean Power)	No..	1		
	SERVICE DUCT				
	LIGHTING INSTALLATIONS				
G	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables** drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories. Note:All switches as schneider to approval	No..	8		
H	Supply and install the following light fittings as detailed in our contract drawing:				
	Type B: LED light	No..	8		
	GROUND FLOOR				
I	**TV/Fire Alarm/Data/Voice/Speaker/ICT/CCTV/Access control point complete with Draw wire in** concealed 25mm HG PVC conduits.	No..	60		
J	Allow for testing and commissioning for lightning & small Power installations.	No.	1		
	SUB TOTAL CARRIED TO COLLECTION PAGE	KSHS.			
1	**SUB-TOTAL BROUGTH FROM PAGE 1ST FLR 1**				
2	SUB-TOTAL BROUGTH FROM PAGE 1ST FLR 2				
3	SUB-TOTAL BROUGTH FROM PAGE 1ST FLR 3				
4	SUB-TOTAL BROUGTH FROM PAGE 1ST FLR 4				
5	**SUB-TOTAL BROUGTH FROM PAGE 1ST FLR 5**				
6	SUB-TOTAL BROUGTH FROM PAGE 1ST FLR 6				
7	SUB-TOTAL BROUGTH FROM PAGE 1ST FLR 7				
8	**SUB-TOTAL BROUGTH FROM PAGE 1ST FLR 8**				
9	**SUB-TOTAL BROUGTH FROM PAGE 1ST FLR 9**				
	SUB-TOTAL FOR FISRT FLOOR CARRIED TO SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT No.2 LIGHTING & SMALL POWER INSTALLATIONS				
	SECOND FLOOR				
	ENTRANCE LOBBY, RAMP & STAIRCASE				
	LIGHTING INSTALLATIONS				
A	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	16		-
	Note:All switches as schneider to approval				
B	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	2		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..	1		
	Supply and install the following light fittings as detailed in our contract drawing:				
C	**Type D: 2**00mm diameter round Recesssed/surface mounted downlight	No..	6		
D	Type K1; Surfaxe mount 12W LED light for staircase as circular or approved equivalent.	No..	3		
E	**Type EXIT:** 8W LED exit light with necessary directional indication	No..	1		
F	**Type DE:2**00mm diameter round Recesssed/surface mounted downlight with Emergency Kit	No..	1		
	SMALL POWER INSTALLATIONS				
G	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
H	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	2		
	ii) 13A Twin switched (Clean Power)	No..			
	WASH ROOMS(AIRLOCK ROOMS)				
	LIGHTING INSTALLATIONS				
I	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø **high impact heavy gauge PVC conduits complete with required accessories.**	No..	14		
	Note:All switches as schneider to approval				
J	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	4		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
K	**Type D: 2**00mm diameter round Recesssed/surface mounted downlight LED	No..	6		
L	Type ML: Recesssed 3W Swivel type LED spot light as mirror light	No..	3		
	SMALL POWER INSTALLATIONS				
M	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
N	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	2		
O	Radial Circuits wired for 20A DP switch for Hand Drier points comprising wiring in 3x2.5mm sq. PVC/SC CU cables drawn in 20mm Φ concealed HG PVC conduits including all conduit accessories.	No..	2		
P	**Supply and install 20A double pole switch for Hand Dyer Point**	No..	2		
	OFFICES				
	LIGHTING INSTALLATIONS				
Q	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables** drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø **high impact heavy gauge PVC conduits complete with required accessories.**	No..	11		
	Note:All switches as schneider to approval				
R	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	4		
	ii) One gang two way	No..	1		
	Supply and install the following light fittings as detailed in our contract drawing:				
S	Type B: 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	4		
T	Type ML: Recesssed 3W Swivel type LED spot light as mirror light	No..	2		
	SMALL POWER INSTALLATIONS				
U	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø** concealed HG PVC conduits including all conduit accessories but excluding plates	No..	8		
V	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	4		
	ii) 13A Twin switched (Clean Power)	No..	4		
	SUB TOTAL CARRIED TO COLLECTION PAGE	KSHS.			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	GENTS CHANGE ROOM				
	LIGHTING INSTALLATIONS				
A	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.**	No..	4		
	Note:All switches as schneider to approval				
B	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..			
	ii) One gang two way	No..	1		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
C	Type D4: 200mm diameter round Recesssed/surface mounted downlight	No..	3		
	SMALL POWER INSTALLATIONS				
D	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates**	No..	1		
E	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	1		
	ii) 13A Twin switched (Clean Power)	No..			
F	**Radial Circuits wired for 20A DP switch for Hand Drier points comprising wiring in conduit accessories.**	No..	1		
G	**Supply and install 20A double pole switch for Hand Dyer Point**	No..	1		
	LADIES CHANGE ROOM				
	LIGHTING INSTALLATIONS				
H	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.**	No..	4		
	Note:All switches as schneider to approval				
I	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..			
	ii) One gang two way	No..	1		
	iii Two gang one way	No..			
J	**Supply and install the following light fittings as detailed in our contract drawing:**				
	Type D4: 200mm diameter round Recesssed/surface mounted downlight	No..	3		
	SMALL POWER INSTALLATIONS				
K	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	1		
L	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	1		
	ii) 13A Twin switched (Clean Power)	No..			
M	**Radial Circuits wired for 20A DP switch for Hand Drier points comprising wiring in** 3x2.5mm sq. PVC/SC CU cables drawn in 20mm Φ concealed HG PVC conduits including all **conduit accessories.**	No..	1		
N	**Supply and install 20A double pole switch for Hand Dyer Point**	No..	1		
	NURSERY AREA-3 SPACES				
	LIGHTING INSTALLATIONS				
O	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	20		
	Note:All switches as schneider to approval				
P	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	3		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
Q	**Type D: 2**00mm diameter round Recesssed/surface mounted downlight	No..	12		
R	**Type DE:2**00mm diameter round Recesssed/surface mounted downlight with Emergency Kit	No..	4		
	SMALL POWER INSTALLATIONS				
S	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates**	No..	12		
T	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	9		
	ii) 13A Twin switched (Clean Power)	No..	3		
	SUB TOTAL CARRIED TO COLLECTION PAGE	KSHS.			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ICU PEADS				
	LIGHTING INSTALLATIONS				
A	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	12		
	Note:All switches as schneider to approval				
B	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
C	Type D: 200mm diameter round Recesssed/surface mounted downlight	No..	8		
D	Type DE:200mm diameter round Recesssed/surface mounted downlight with Emergency Kit	No..	1		
	SMALL POWER INSTALLATIONS				
E	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates**	No..	8		
F	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	6		
	ii) 13A Twin switched (Clean Power)	No..	2		
	NURSE STATION & DUTY ROOM				
	LIGHTING INSTALLATIONS				
G	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	7		
	Note:All switches as schneider to approval				
H	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	1		
	Supply and install the following light fittings as detailed in our contract drawing:				
I	Type DL:200mm Decorative round surface mounted IP20 LED Luminaire	No..	4		
J	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	1		
	SMALL POWER INSTALLATIONS				
K	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	3		
L	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	2		
	ii) 13A Twin switched (Clean Power)	No..	1		
M	**Radial Circuits wired for 20A DP switch for Hand Drier points comprising wiring in conduit accessories.**	No..	1		
N	**Supply and install 20A double pole switch for Hand Dyer Point**	No..	1		
	CORRIDOR AREA				
	LIGHTING INSTALLATIONS				
O	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	20		
	Note:All switches as schneider to approval				
P	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	ii) One gang two way	No..	3		
	iii Two gang one way	No..	2		
	Supply and install the following light fittings as detailed in our contract drawing:				
Q	Type B: 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	12		
R	**Type DE: 2**00mm diameter round Recesssed/surface mounted downlight LED	No..	3		
	SMALL POWER INSTALLATIONS				
S	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	5		
T	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	5		
	SUB TOTAL CARRIED TO COLLECTION PAGE	KSHS.			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	POST- NATAL NORMAL DELIVERY WARD 01				
	LIGHTING INSTALLATIONS				
A	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables				
	drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø				
	high impact heavy gauge PVC conduits complete with required accessories.	No..	28		
	Note:All switches as schneider to approval				
B	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	3		
	ii) One gang two way	No..	3		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
C	Type B: 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	15		
D	**Type R3E :** Weather proof LED tube light with emergency kit	No..	3		
E	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	3		
	SMALL POWER INSTALLATIONS				
F	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø				
	concealed HG PVC conduits including all conduit accessories but excluding plates	No..	19		
G	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	16		
	ii) 13A Twin switched (Clean Power)	No..	3		
	NURSE STATIONS & DUTY ROOM				
	LIGHTING INSTALLATIONS				
H	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables				
	drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø				
	high impact heavy gauge PVC conduits complete with required accessories.	No..	12		
	Note:All switches as schneider to approval				
I	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	2		
	ii) One gang two way	No..	2		
	Supply and install the following light fittings as detailed in our contract drawing:				
J	**Type DL:**200mm Decorative round surface mounted IP20 LED Luminaire	No..	6		
K	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	2		
	SMALL POWER INSTALLATIONS				
L	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø				
	concealed HG PVC conduits including all conduit accessories but excluding plates	No..	4		
M	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	ii) 13A Twin switched (raw Power)	No..	2		
	iii) 13A Twin switched (Clean Power)	No..	2		
N	**Radial Circuits wired for 20A DP switch for Hand Drier points comprising wiring in**				
	conduit accessories.	No..	2		
O	**Supply and install 20A double pole switch for Hand Dyer Point**	No..	2		
	LABOUR WARD WASH ROOMS				
	LIGHTING INSTALLATIONS				
P	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables				
	drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø				
	high impact heavy gauge PVC conduits complete with required accessories.	No..	10		
	Note:All switches as schneider to approval				
Q	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang two way	No..	2		
	ii) Two gang one way	No..	2		
	Supply and install the following light fittings as detailed in our contract drawing:				
R	Type D4: 200mm diameter round Recesssed/surface mounted downlight	No..	6		
	SMALL POWER INSTALLATIONS				
S	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø				
	concealed HG PVC conduits including all conduit accessories but excluding plates	No..	1		
T	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	ii) 13A Twin switched (raw Power)	No..	1		
	SUB TOTAL CARRIED TO COLLECTION PAGE	KSHS.			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	POST-NATAL (CS OPTION ROOM)				
	LIGHTING INSTALLATIONS				
A	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø** high impact heavy gauge PVC conduits complete with required accessories.	No..	24		
	Note:All switches as schneider to approval				
B	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	3		
	ii) One gang two way	No..	3		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
C	Type B: 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	12		
D	**Type R3E :** Weather proof LED tube light with emergency kit	No..	3		
E	**Type ML: Recesssed 3W Swivel type LED spot light as mirror light**	**No..**	**3.00**		
	SMALL POWER INSTALLATIONS				
F	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	15		
G	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	12		
	ii) 13A Twin switched (Clean Power)	No..	3		
	AIR LOCK & WASH ROOMS				
	LIGHTING INSTALLATIONS				
H	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.**	No..	12		
	Note:All switches as schneider to approval				
I	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	2		
	ii) One gang two way	No..	4		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
J	Type DL:200mm Decorative round surface mounted IP20 LED Luminaire	No..	4		
K	Type ML: Recesssed 3W Swivel type LED spot light as mirror light	No..	2		
	SMALL POWER INSTALLATIONS				
L	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø**				
M	**concealed HG PVC conduits including all conduit accessories but excluding plates**	No..	2		
N	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	2		
	COMMON STAFF ROOM				
	LIGHTING INSTALLATIONS				
O	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø** high impact heavy gauge PVC conduits complete with required accessories.	No..	7		
	Note:All switches as schneider to approval				
P	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
Q	Type B: 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	4		
	SMALL POWER INSTALLATIONS				
R	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø				
	concealed HG PVC conduits including all conduit accessories but excluding plates	No..	5		
S	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	3		
	ii) 13A Twin switched (Clean Power)	No..	2		
	SUB TOTAL CARRIED TO COLLECTION PAGE	KSHS.			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	POST-NATAL SICK WARD				
	LIGHTING INSTALLATIONS				
A	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø** high impact heavy gauge PVC conduits complete with required accessories.	No..	9		
	Note:All switches as schneider to approval				
B	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	2		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
C	Type B: 600X600mm LED panel or approved equivalent c/w necessary mounting	No..	4		
D	**Type R3E :** Weather proof LED tube light with emergency kit	No..	1		
E	Type ML: Recesssed 3W Swivel type LED spot light as mirror light	No..	1		
	SMALL POWER INSTALLATIONS				
F	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates**	No..	6		
G	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	4		
	ii) 13A Twin switched (Clean Power)	No..	2		
	SLUICE & WASH ROOM				
	LIGHTING INSTALLATIONS				
H	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø **high impact heavy gauge PVC conduits complete with required accessories.**	No..	5		
	Note:All switches as schneider to approval				
I	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	1		
	iii Two gang one way	No..			
J	**Supply and install the following light fittings as detailed in our contract drawing:**				
	Type D4: 200mm diameter round Recesssed/surface mounted downlight	No..	3		
	SMALL POWER INSTALLATIONS				
K	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø **concealed HG PVC conduits including all conduit accessories but excluding plates**	No..	1		
L	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	i) 13A Twin switched (raw Power)	No..	1		
	NURSE STATIONS & DUTY ROOM				
	LIGHTING INSTALLATIONS				
M	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	12		
	Note:All switches as schneider to approval				
N	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	2		
	ii) One gang two way	No..	2		
	Supply and install the following light fittings as detailed in our contract drawing:				
O	**Type DL:2**00mm Decorative round surface mounted IP20 LED Luminaire	No..	6		
P	**Type ML:** Recesssed 3W Swivel type LED spot light as mirror light	No..	2		
	SMALL POWER INSTALLATIONS				
Q	Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates	No..	4		
R	**Moulded socket outlet plates as MK range or approved equivalent as follows:**				
	ii) 13A Twin switched (raw Power)	No..	2		
	iii) 13A Twin switched (Clean Power)	No..	2		
S	**Radial Circuits wired for 20A DP switch for Hand Drier points comprising wiring in** conduit accessories.	No..	2		
T	**Supply and install 20A double pole switch for Hand Dyer Point**	No..	2		
	SUB TOTAL CARRIED TO COLLECTION PAGE	KSHS.			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ADMISSION AREA				
	LIGHTING INSTALLATIONS				
A	Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.	No..	6		
	Note:All switches as schneider to approval				
B	10A moulded ivory type switch plates as MK range or approved equivalent as follows:				
	i) One gang one way	No..	1		
	ii) One gang two way	No..	1		
	iii Two gang one way	No..			
	Supply and install the following light fittings as detailed in our contract drawing:				
C	Type DL:100mm Decorative round surface mounted IP20 LED Luminaire	No..	4		
	SMALL POWER INSTALLATIONS				
D	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø concealed HG PVC conduits including all conduit accessories but excluding plates**	No..	3		
E	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	i) 13A Twin switched (raw Power)	No..	2		
	ii) 13A Twin switched (Clean Power)	No..	1		
	RIGHT WING LOBBY & STAIRCASE				
	LIGHTING INSTALLATIONS				
F	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø high impact heavy gauge PVC conduits complete with required accessories.**	No..	16		
	Note:All switches as schneider to approval				
G	**10A moulded ivory type switch plates as MK range or approved equivalent as follows:**				
	i) One gang one way	No..	1		
	ii) One gang two way	**No..**	**2.00**		
	iii Two gang one way	No..	1		
	Supply and install the following light fittings as detailed in our contract drawing:				
H	Type K1; Surfaxe mount 12W LED light for staircase as circular or approved equivalent.	No..	4		
I	Type EXIT: 8W LED exit light with necessary directional indication	No..	1		
J	Type DE:200mm diameter round Recesssed/surface mounted downlight with Emergency Kit	No..	3		
K	Type W: Decorative Wall Bracket Lighting Points compete with Lamp holder as LED.	No..	4		
	SMALL POWER INSTALLATIONS				
L	**Socket outlet power points wired in 3 x 2.5mm sq. PVC/SC copper cables drawn in 20mm Ø** concealed HG PVC conduits including all conduit accessories but excluding plates	No..	2		
M	Moulded socket outlet plates as MK range or approved equivalent as follows:				
	ii) 13A Twin switched (raw Power)	No..	2		
	SERVICE DUCT				
	LIGHTING INSTALLATIONS				
N	**Supply and install wiring to light fittings wired in 3 x 1.5 mm sq. PVC SC cables drawn in concealed/fixed in surface and fasten by saddles at every 1.0M in 20mm Ø** high impact heavy gauge PVC conduits complete with required accessories.				
	Note:All switches as schneider to approval	No..	8		
O	**Supply and install the following light fittings as detailed in our contract drawing:**				
	Type B: LED light	No..	8		
	SECOND FLOOR				
P	TV/Fire Alarm/Data/Voice/Speaker/ICT/CCTV/Access control point complete with Draw wire in concealed 25mm HG PVC conduits.	No..	60		
Q	Allow for testing and commissioning for lightning & small Power installations.	No.	1		
	SUB TOTAL CARRIED TO COLLECTION PAGE	KSHS.			
	COLLECTION	KSHS.			
	SUB-TOTAL BROUGHT FROM PAGE 2ND FLR 1				
	SUB-TOTAL BROUGHT FROM PAGE 2ND FLR 2				
1	**SUB-TOTAL BROUGHT FROM PAGE 2ND FLR 3**	KSHS.			
2	SUB-TOTAL BROUGHT FROM PAGE 2ND FLR 4	KSHS.			
3	SUB-TOTAL BROUGHT FROM PAGE 2ND FLR 5	KSHS.			
	SUB-TOTAL BROUGHT FROM PAGE 2ND FLR 6				
	SUB-TOTAL BROUGHT FROM PAGE 2ND FLR 7				
	SUB-TOTAL FOR 2ND FLOOR CARRIED TO SUMMARRY PAGE	KSHS			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT No.1 SUB-MAIN AND DISTRIBUTION CABLES				
	SUB-MAIN AND DISTRIBUTION CABLES				
A	Supply and install 4CX300mmsq.Armoured Copper Cable Cable drawn on tray / ladder / Trench from the Generators/TX to the Main L.V switchboard. The Cables to be complete with Glands, Lugs,Cable ties, Labeling and all accessories for sub mains cabling.	LM			
B	Supply and install 4CX120mmsq. XLPE/SWA/PVC Copper Cable drawn on tray / ladder from the Main L. V. Switchboard to the Sub-Boards at different levels and locations. The Cables to be complete with Glands, Lugs, Cable ties, Labeling and all accessories for sub mains cabling.	LM	**80.00**		
C	Supply and install 4CX95mmsq. XLPE/SWA/PVC Copper Cable drawn on tray / ladder from the Main L. V. Switchboard to the Sub-Boards at different levels and locations. The Cables to be complete with Glands, Lugs, Cable ties, Labeling and all accessories for sub mains cabling.TOTAL LENGTH	LM	**30.00**		
D	Supply and install 4CX70mmsq. XLPE/SWA/PVC Copper Cable drawn on tray / ladder from the Main L. V. Switchboard to the Sub-Boards at different levels and locations. The Cables to be complete with Glands, Lugs, Cable ties, Labeling and all accessories for sub mains cabling. TOTAL LENGTH	LM	**70.00**		
E	Supply and install 4CX35mmsq. XLPE/SWA/PVC Copper Cable drawn on tray / ladder from the Main L. V. Switchboard to the Distribution-Boards at different levels and locations. The Cables to be complete with Glands, Lugs, Cable ties, Labeling and all accessories for sub mains cabling. TOTAL LENGTH	LM	**60.00**		
F	Supply and install 4CX25mmsq. XLPE/SWA/PVC Copper Cable drawn on tray / ladder from the Main L. V. Switchboard to the Sub-Boards at different levels and locations. The Cables to be complete with Glands, Lugs, Cable ties, Labeling and all accessories for sub mains cabling. TOTAL LENGTH	LM	**30.00**		
G	Supply and install 4CX16mmsq. XLPE/SWA/PVC Copper Cable drawn on tray / ladder from the Main L. V. Switchboard to the Sub-Boards at different levels and locations. The Cables to be complete with Glands, Lugs, Cable ties, Labeling and all accessories for sub mains cabling. TOTAL LENGTH	LM	**30.00**		
H	Supply and install 3CX16mmsq. PVC/SWA/PVC Copper Cable drawn on tray / ladder to Consumer Units at different levels. The Cables to be complete with Glands, Lugs, Cable ties, Labeling and all accessories for sub mains cabling.	LM	**50.00**		
	SUB TOTAL CARRIEED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUB-TOTAL BROUGHT FROM PREVIOUS PAGE				
	ELECTRICAL CONNECTIONS TO MECHANICAL EQUIPMENT				
	BOOSTER/SUMP/ PRESSURIZING/SOLAR WATER/ FANS PUMPS				
A	Supply and install wiring 4Cx4.0mmsq.PVC.SWA.PVC.from the Mechanical Board to the Pumps Control Panel located at the pump room. The Cables to be complete with Glands, Lugs, Cable ties, Labeling and all accessories for sub mains cabling.	LM			
	A/C out door units				
B	Supply and install wiring 4Cx35mmsq.PVC.SWA.PVC.from the Mechanical Sub Board to the Fans/Pumps Control Panel located at pump room. The Cables to be complete with Glands, Lugs, Cable ties, Labeling and all accessories for sub mains cabling.	LM			
C	Supply and install wiring 4Cx6.00mmsq.PVC.SWA.PVC.from the Mechanical Sub Board to the Fans/Pumps Control Panel located at pump room. The Cables to be complete with Glands, Lugs, Cable ties, Labeling and all accessories for sub mains cabling.	LM			
D	Supply and install wiring in radial circuit wired in 3CX2.5mm sq.PVC.SC cables drawn in concealed 20mmØ high impact heavy gauge PVC conduits to the 20A DP switch for hand drier points detailed on the contract drawing.	LM			
E	Supply and install 20A double pole switch forA/C Equipment Point				
	ISOLATORS				
F	Allow for 200A T.P isolators for A/C machines	No..			
G	Allow for 80A T.P isolator for Pumps, A/C and Lifts	No..			
Q	Allow for 40A T.P isolator for the Pumps, A/C and Fans	No..			
H	Allow for 32A T.P isolator for the Fans	No..			
	NB: Final connections by others				
	SPECIAL NOTES: All Sub Main cables to be labbled in laminated lables at both outgoing from the LV Switch board and at the Termination point of the Board or the Isolator. All Sub Main cables to be Terminated in Brass cable Glands complete with Brass Earthing Rings. All Sub Main cables to be fixed on the cable tray with U.V heavy duty cable ties. All separate Earth cables to be fixed on a cable tray/ Ladder in the Electrical Riser each labeled separately in laminated lables. **All Armoured cables to be unrolled on a cable drum and Jacks.**				
	COST FOR ELEMENT NO.1 - SUB-MAIN AND DISTRIBUTION CABLES	KSHS			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT No.3 SUB-BOARDS INSTALLATION				
	SUB-BOARDS INSTALLATION,DISTRIBUTION BOARDS AND CONSUMER UNITS				
A	Supply and Install wall mounted sub boards located in the ground Electrical Services Ducts on Ground floor /First/ Second Floors and Mechanical as Schinder /Terasaki/MEM or equivalent and approved complete with the following: **(a)1No. X 250A TP MCCB incoming** **(b) 1No. X 160A TP MCCB outgoing** **(c) 2No. X 125A TP MCCB outgoing** **(c) 4No. X 80A TP MCCB outgoing** **(d) 5No. X 63A SP MCCB outgoing Item 6** (e) 2No. X Blanking plates for spareways - (f)The above Sub Board to be complete with labelling in engaved tyfode and all necessary **identtification**	Item	1		
	DISTRIBUTION BOARDS & CONSUMER UNITS				
	GROUND FLOOR				
B	Supply and Install **250Amps 18Way TPN** Distribution Board Ref:**DB01- G Right wing & Radialogy area** Power Supply Lighting and Power (Surface mounted) -	No..	1		
D	Supply and Install the following M.C.B -				
	i). 250A TP MCCB Incoming	No.	1		
	ii). 125A TP MCCB outgoing	No.	1		
	ii). 80A TP for Radialogy machines	No.	1		
	iv). 32A S.P Small power	No.	1		
	v). 20A S.P Small Power	No.	2		
	vi). 20A S.P Lighting	No.	1		
	vii). 10A S.P Lighting	No.	2		
	viii). 80A TP - Spare	No.	1		
	ix). 10A S.P - Spare	No.	1		
	x). 32A S.P - Spare	No.	1		
	xi). Blanking Plates	No.	5		
E	Supply and Install 150mm×75mm Surface mounted **Coated Trunking to take all power & Lighting Sub-Circuit -**	LM	20		
F	**Supply and install all sub-circuit Labels in Trafollyte**	No..	20		
G	Supply and install 415V Hatari/Danger Label in the Trafollyte	No..	4		
H	All penetrations to the Surface-Distribution Board shall be in PVC-glands	No.	27		
I	Supply and Install **250Amps 18Way TPN** Distribution Board Ref:**DB02- Left wing & Out-Patient area** Power Supply Lighting and Power (Surface mounted) -	No..	1		
J	Supply and Install the following M.C.B -				
	I). 250A TP MCCB Incoming	No.	1		
	II). 125A TP MCCB outgoing	No.	1		
	III). 32A S.P Small power	No.	1		
	IV). 20A S.P Small Power	No.	2		
	V). 10A S.P Lighting	No.	2		
	VI). 63A TP - Spare	No.	1		
	VII). 10A S.P - Spare	No.	1		
	VIII). 32A S.P - Spare	No.	1		
	IX). Blanking Plates	No.	3		
K	**Supply and Install 150mm×75mm Surface mounted** Coated Trunking to take all power & Lighting Sub-Circuit -	LM	100		
L	**Supply and install all sub-circuit Labels in Trafollyte**	No..	12		
M	**Supply and install 415V Hatari/Danger Label in the Trafollyte**	No..	4		
N	**All penetrations to the Surface-Distribution Board shall be in PVC-glands**	No.	24		
	SUB-TOTAL CARRIED TO COLLECTION PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	FIRST FLOOR				
A	**Supply and Install 125Amps 18Way TPN** Distribution Board **Ref:DB03- Left wing (Operation area)** Power Supply Lighting and Power (Surface mounted) -	No..	1		
B	Supply and Install the following M.C.B -				
	ii). 125A TP MCCB outgoing	No.	1		
	ii). 80A TP for Radialogy machines	No.	1		
	iv). 32A S.P Small power	No.	2		
	v). 20A S.P Small Power	**No.**	**2.00**		
	vi). 20A S.P Lighting	No.	2		
	vii). 10A S.P Lighting	No.	1		
	viii). 80A TP - Spare	No.	1		
	ix). 10A S.P - Spare	No.	1		
	x). 32A S.P - Spare	No.	3		
	xi). Blanking Plates				
C	**Supply and Install 150mm×75mm Surface mounted** **Coated Trunking to take all power & Lighting Sub-Circuit -**	LM	25		
D	Supply and install all sub-circuit Labels in Trafollyte	No..	12		
E	Supply and install 415V Hatari/Danger Label in the Trafollyte	No..	4		
F	All penetrations to the Surface-Distribution Board shall be in PVC-glands	No.	24		
G	Supply and Install **125Amps 18Way TPN** Distribution Board Ref:**DB04- Right wing (Labour 02)** Power Supply Lighting and Power (Surface mounted) -	No..	1		
H	Supply and Install the following M.C.B -				
	II). 125A TP MCCB outgoing		1		
	III). 32A S.P Small power		1		
	IV). 20A S.P Small Power		2		
	V). 10A S.P Lighting		2		
	VI). 63A TP - Spare		1		
	VII). 10A S.P - Spare		1		
	VIII). 32A S.P - Spare		1		
	IX). Blanking Plates		3		
I	**Supply and Install 150mm×75mm Surface mounted** **Coated Trunking to take all power & Lighting Sub-Circuit -**	LM	25		
J	**Supply and install all sub-circuit Labels in Trafollyte**	No..	12		
K	Supply and install 415V Hatari/Danger Label in the Trafollyte	No..	4		
L	All penetrations to the Surface-Distribution Board shall be in PVC-glands	No.	24		
	SUB-TOTAL CARRIED TO COLLECTION PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SECOND FLOOR				
A	Supply and Install **125Amps 18Way TPN** Distribution Board **Ref:DB05- Left wing (Nursery & Post Natal area)** Power Supply Lighting and Power (Surface mounted) -	No..	1		
B	Supply and Install the following M.C.B -				
	I). 125A TP MCCB Incoming	No.	1		
	II). 32A S.P Small power	No.	2		
	III). 20A S.P Small Power	No.	2		
	IV). 10A S.P Lighting	No.	2		
	V). 63A TP - Spare	No.	1		
	VI). 10A S.P - Spare	No.	1		
	VII). 32A S.P - Spare	No.	1		
	VIII). Blanking Plates	No.	3		
C	**Supply and Install 150mm×75mm Surface mounted Coated Trunking to take all power & Lighting Sub-Circuit -**	LM	30		
D	Supply and install all sub-circuit Labels in Trafollyte	No..	12		
E	Supply and install 415V Hatari/Danger Label in the Trafollyte	No..	4		
F	All penetrations to the Surface-Distribution Board shall be in PVC-glands	No.	24		
G	Supply and Install **125Amps 18Way TPN** Distribution Board Ref:**DB06- Right wing (Post Natal CS area)** Power Supply Lighting and Power (Surface mounted) -	No..	1		
H	**Supply and Install the following M.C.B -**				
	II). 125A TP MCCB outgoing		1		
	III). 32A S.P Small power		1		
	IV). 20A S.P Small Power		2		
	V). 10A S.P Lighting		2		
	VI). 63A TP - Spare		1		
	VII). 10A S.P - Spare		1		
	VIII). 32A S.P - Spare		1		
	IX). Blanking Plates		3		
I	Supply and Install 150mm×75mm Surface mounted Coated Trunking to take all power & Lighting Sub-Circuit -	LM	30		
J	**Supply and install all sub-circuit Labels in Trafollyte**	No..	12		
K	**Supply and install 415V Hatari/Danger Label in the Trafollyte**	No..	4		
L	**All penetrations to the Surface-Distribution Board shall be in PVC-glands**	**No.**	**24.00**		
M	Allow for testing and commissioning for Sub-Boards installations.	No.	1		
	SUB-TOTAL CARRIED TO COLLECTION PAGE	Kshs.			
	COLLECTION				
	SUB-TOTAL BROUGHT FROM PAGE SUB-BOARDS 1	Kshs.			
	SUB-TOTAL BROUGHT FROM PAGE SUB-BOARDS 2				
	SUB-TOTAL BROUGHT FROM PAGE SUB-BOARDS 3				
	SUB-TOTAL BROUGHT FROM PAGE SUB-BOARDS 4	Kshs.			
	TOTALS FOR SUB BOARD, DISTRIBUTION BOARDS, AND CONSUMER UNITS CARRIED TO SUMMARRY PAGE	Kshs.			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO.4				
	CABLE TRAYS & CABLE LADDERS				
A	**Supply and install 600mm wide x 100mm** deep powder coated **cable ladders** in **Ground Floor Level c/w connectors, fixing brackets and rawl bolts at every** 1.0 M for **Power cables**, as detailed in our contract drawing	LM	20		
B	Supply and install **300mm wide x 50mm** deep 16g G1 Cable tray in the **Riser Ducts and in the Passage way** Ceilingsc/w connectors, fixing brackets at every 1.0 M for **Power Cable and ICT/CCTV DATA cables.**	LM	260		
C	Supply and install **150 mm wide x 50mm** deep 16g G1 Cable tray in the - **Passage way** Ceilingslinks to various areas c/w Connectors, fixing brackets - and rawl bolts at every 1.0 M for **ICT/CCTV DATA cables.**	LM	530		
D	Allow for testing and commissioning for Cable trays & ladders	No.	1		
	COST FOR ELEMENT NO.4 - CABLE TRAYS & LADDERS INSTALLATIONS	KSHS			
	ELEMENT NO.5				
	EARTHING INSTALLATIONS				
E	**Supply and install Earth Matts to the Electrical Equipments at the Ground Floor. The lattice matt shall be constructed in 1.0M x 1.0M with 25mm wide x 3mm deep Copper tape with copper revets and laid 3.0 Meters in Ground floor level and covered with redsoil/salt/charcoal and filled back. The lead from the copper lattice matt to the** Ground level shall also be 25mm x 3mm copper tape. The Contractor to carry out an Earth Test **and forward the result to the Engineer. -**	NO..	12		
F	**Supply and install 600mm L x 50mm W x 6 mm thick Equipotential Earth Bars -** on Insulators in the Equipments' Rooms	Item	1		
G	Allow for 95 mm PVC-PVC Earth conductror cable from the matt - to the Equipment complete with lugs	LM	120		
H	Equiment - RMU - Transfomer HV Transfomer Body Generators Neutral Generator Body **Switch Board** **Stabilizer** Mechanical Pumps Server Room Radiology Board A/C Board **Bonding of All electrical Equipment**				
I	**Allow for testing and commissioning for entire grounding systems.**	No.	1		
	COST FOR EARTHING INSTALLATIONS	KSHS			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	LIGHTENING PROTECTION				
A	**Supply and install 25mmx3 mm COPPER TAPE complete with copper sanddies fixed at every 1.0 m spacing. The copper tape to be:-**				
	(i) Fixed round the roof level connectioon all arrestors				
	(ii) Connected to the end of thee welded rods in the columns from the Ground floor				
	(iii) Connected to the Earth matt lattice from the test clamps	LM	360		
B	**Supply and install SQUARE COPPER CONNECTOR BLOCKS to be used at every** copper bend	No	6		
C	Supply and install LIGHTENING ARRESTOR sets with the following				
	(i)Air Terminal multible points				
	(ii)1000mm long x16mm copper rod				
	(iii)AirTerminal multible base Set	SET	6		
D	**Supply and install Srews Down type TESTS CLAMPS suitable for 25mm tape**				
E	Supply and install EARTHING MATT LATTICE, built in 25mmx3 mm copper plate **(1.0 m x 1.0 m) with copper rivets and laid in ground 3.0 m deep with 4No x 1800mm long coper earth electrodes**	No	6		
F	Fix and provide adhesive brassing at the ground floor tests clamp points where copper penetrates in the columns and contain joining the earth matt lattice	Item	1		
G	Allow for testing and commissioning for entire lightning protection and grounding system	No.	1		
	COST FOR LIGHTENING PROTECTION	Kshs.			
	ELEMENT NO.6				
	INTELLIGENT FIRE ALARM SYSTEM INSTALLATION				
H	Supply of Main Fire Alarm Control Panel (Four Loops): -	No.	1		
	Fire Alarm Control Panel consisting of:				
	I). Central Processor Unit Module	No.	1		
	II). Liquid Crystal Display Module -	No.	1		
	III). Primary Power supply with Local Rail Module, 230V	No.	1		
	IV). Dual Driver Controller (Loop Card- 2 loops)	No.	1		
		No.	1		
	V). Blank LRM Filler (plastic)	No.	1		
		No.	1		
	VI). CAB 5 (Cabinet with 5 slots)	No.	1		
		No.	1		
	VII). Door for CAB7B Series Wallbox	No.	1		
		No.	1		
	VIII). 17Ah Sealed Lead Acid Battery - 12Vdc No. 2 -	No.	2		
	Supply of Field Devices -				
I	Analogue Addressable Photoelectric Smoke Detector	No.	80		
J	Analogue Addressable Fixed Temperature/Rate-of-Rise Heat Detector I). 135F,15F per minute -	No.	9		
	II). Detector Base	No.	60		
	III). Detector Base with Isolator	No.	9		
	IV). Looped Powered Sounders	No.	9		
	V). European Call Point - Addressable Break GlassType	No.	12		
	VI). Surface Mount Box for Break Glass Call point above	No.	12		
	PROVISIONAL SUMS				
	Installation including 2.5mm sq fire retadant cables and all needed - accessories, testing, programming and commissioning.	Item	1		
K	The Fire Alarm System to be Intergrated to the Fire Fighting System, and Staircase Pressurization System				
	NB: The Fire Alarm System to be interfaced with the Fire Sprinkler System.				
L	**Allow for testing and commissioning for entire Inteligent Fire system installation**	No.	1		
	TOTAL COST FOR ELEMENT NO.6: FIRE ALARM INSTALLATION	KSHS			

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUMMARY PAGE				
1	GROUND FLOOR				
2	FIRSST FLOOR				
3	SECOND FLOOR				
4	SUB-MAIN AND DISTRIBUTION CABLES				
5	DISTRIBUTIONS BOARDS	Kshs.			
6	CABLE TRAYS & LADDERS INSTALLATIONS	Kshs.			
7	EARTHING INSTALLATIONS	Kshs.			
8	LIGHTENING PROTECTION INSTALLATIONS	Kshs.			
9	INTELLIGENT FIRE ALARM SYSTEM INSTALLATION	Kshs.			
10	Allow a Provsional Audio Nurse call Center Installation	Kshs.			
11	Allow a Provsional Audio Visual System Installation	Kshs.			
12	Allow a Prime cost sums for Switchgear, incoming HT and LV cables and Termaination to the Switch Board.	KSHS			
13	Allow Provisional Sum For Voltage Stabilizer	KSHS			
14	Allow Provisional Sum For Main L.V Board	KSHS			
15	Allow Provisional Sum for UPS system & Cabling and Medical Isolation Panels.	KSHS			
	TOTAL CARRIED TO MAIN SUMMARY PAGE				

Item	Description	Qty	Unit	Rate	Shs
	PRIME COST SUMS				
	X-RAY LEAD LINED DOORS				
A	Include the Prime Cost Sum of Kenya Shillings One million Only (Kshs. 1,000,000.00) for supply and installation of 4 nr 1500mm x 2400mm X-RAY LEAD LINED Doors to include portable and fixed equipments including all accesories to be executed by a Nominated Sub- contractor	1	ITEM	1,000,000.00	1,000,000.00
B	Allow for attendance	1,000,000.00	%		
C	Allow for profits and over heads	1,000,000.00	%		
	PROVISIONAL SUM				
	CONTIGENCIES				-
	The following provisional sums to be spent/ deducted inwhole o r in part at the discretion of the Architect. Provisional Sums.				-
D	Provide Kenya shillings Three Million only (kshs3,000,000.00)only for contingencies.	1	ITEM	3,000,000.00	3,000,000.00
	Credit For Materials on Site				
	Allow for following provisional Quantities and sums as credit for using cleared trees as round poles				
E	Allow **Credits** of ksh 200,0000 for havesting Aproximatetle 1000 pcs and re-using in the project 150mm thick x Avarage 6m High (Aprox) Blue gum trees to be used as supports to suspended slabs	1	ITEM	(200,000.00)	(200,000.00)
TOTAL FOR PROVISIONAL AND PRIME COST SUMS **CARRIED TO MAIN BUILDING SUMMARY**					

P.C/P.S//l

SUMMARY- MAIN BUILDING

	SECTION 1-SUMMARY -		***FROM PAGE***		**Amount**
	MAIN BUILDING				KSH
1	BUILDERS WORKS		*Sect-1-Sum-1*		
2	MECHANICAL WORKS		Sect-1-Sum-2		
3	ELECTRICAL WORKS		Sect-1-Sum-4		
4	PRIME & PROVISIONAL SUMS		P.C/P.S//I		
	TOTAL CARRIED TO THE MAIN SUMMARY PAGE				

AMOUNT IN WORDS…..
…..

(SIGNATURE OF EMPLOYER)

NAME OF THE CONTRACTOR; ….....

ADDRESS: _____ ADDRESS: _____

NAME OF AUTHORIZED PERSON…..

DATE : _____ DATE : _____

SECTION 2

ANCILLARY WORKS

REPUBLIC OF KENYA

BOMET COUNTY.

Department of Roads,Transport & Public works

PROPOSED GATE & GATE HOUSE AND FENCE

AT MOTHER & CHILD WELLNESS CENTRE

BOMET COUNTY.

Bill of quantities

ARCHITECT
PUBLIC WORKS
ARCHITECTS
BOMET COUNTY
P.O.BOX 496-20400,
BOMET.

STRUCTURAL ENGINEERS
PUBLIC WORKS
ENGINEERS
BOMET COUNTY
P.O.BOX 19-20400,
BOMET.

QUANTITY SURVEYORS
PUBLIC WORKS
SURVEYORS
BOMET COUNTY
P.O.BOX 19-20400,
BOMET.

05/Oct/21

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.9				
	SUBSTRUCTURES / PROVISIONAL				
	Element 1				
	SITE CLEARANCE				
A	Clear site of bushes,shrubs and the like, grup up there root and burn the arisings	SM	18.0		
B	Excavate vegetable top soil average 150mm deep set aside in spoil heaps and later spread around the site as directed.	SM	18.0		
C	Excavate oversite commencing from stripped level average depth 200mm but not exceeding 1.5m deep	SM	16.0		
D	Excavate foundation trench not exceeding 1.50m deep commencing from stripped level and backfill	CM	13.0		
E	Ditto but to columns	CM	23.0		
F	Allow for keeping excavations free from all water by pumping or otherwise	ITEM	1.0		
	Disposal				
G	Load,wheel and cart away surplus soil.	CM	17.0		
	Hardcore filling				
H	Imported hardcore, Hand packed; water and well compacted of 150mm thickness and minimum depth of 300mm.	SM	16.0		
J	50mm thick murram blinding to surfaces of hardcore	SM	16.0		
	Anti-termite treatment				
K	Termidor' or other equal and approved chemical treatment to surfaces of blinded hardcore and around foundations; apply in accordance with manufacturers specification; provide a ten(10) written quarantee against termites	SM	16.0		
	Mesh fabric reinforcement to B.S 4483 and setting in concrete with 300mm side and end laps (measured nett-allow for laps)				
L	Fabric mesh ref:A98 weighing 0.98 kg per square metre in floor bed	SM	16.0		
	DAMP PROOF MEMBRANE				
M	1000 gauge polythene damp proof memmbrane laid under surface bed with 300mm side and end laps (measured net -allow for laps)	SM	16.0		
	CONCRETE				
	50mm thick concrete (1:4:8 mix) blinding under;				
N	Column Bases and stripfooting	SM	24.0		
	Insitu concrete class 20/20, vibrated and reinforced as described, in:-				
P	Groundbeams	CM	2.0		
Q	Ditto but to stripfooting	CM	2.0		
R	Ditto but to foundation columns and bases	CM	10.0		
S	100mm thick V R C surface bed	SM	34.0		
	Reinforcement works all in accordance with the Engineer's details and approval including all cutting,bending,laying and binding wire to;				
T	Column bases and Foundation columns	Kg	900.0		
U	Groundbeams	Kg	180.0		
V	strip footing	Kg	80.0		
	Carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	SAWN FORMWORK TO;				
A	Vertical sides of groundbeams	SM	12.0		
B	Ditto but to Column bases and foundation columns	SM	33.0		
C	Edges of ground floor slab over 75mm but not exceeding 150mm high	LM	15.0		
	Foundation walls				
D	200mm thick natural stone wall foundations bedded and jointed in c.s morta 1;4 with hoop iron bars at alternate course	SM	23.0		
	DPC **Three -ply bituminous felt damp proof course bedded in cement and sand morta(1;3)**				
E	200mm Wide horizontal layer	LM	17.0		
	PLINTH FINISH				
	Cement and Sand 1:4 render				
F	12 mm thick render wood float	SM	6.0		
	Prepare and apply two coats bituminous paint to:				
G	Render surfaces externally	SM	6.0		
	Carried to collection				
	COLLECTION				
1	**Total Brought Forward From Page No.2**				
2	**Total Brought Forward From Page No. 3**				
	TOTAL CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate *Kshs*	Amount *Kshs*
	REINFORCED CONCRETE WORKS SUPERSTRUCTURE				
	Element NO. 2				
	Vibrated reinforced concrete (1;2;4) class 25 in;				
A	Columns	CM	5.0		
B	Ditto but to Ring Beams.	CM	2.0		
C	Ditto but to 350 wide x 650mm high Rc water guters	SM	17.0		
D	Ditto but to 125mm thick RC Slab above the gate.	SM	18.0		
	REINFORCEMENT (ALL PROVISIONAL)				
	Reinforcement in different sizes in structural concrete work all in accordance with the Engineer's details and approval including all cutting,bending,laying and binding wire to;				
E	Columns	kg	450.0		
F	Ditto but to Ring Beams.	kg	180.0		
F	Ditto but to Rc suspended slabs and gutters	kg	394.0		
	SAWN FORMWORK TO;				
G	Sides of columns.	SM	47.0		
H	Ditto but to Ring Beams.	SM	11.0		
H	Ditto but to soffits of the Rc slab at the entrance gate	SM	35.0		
H	Ditto but to soffits of the Rc Rc gutters	SM	26.0		
	Carried to summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	Element NO.3				
	LOAD BEARING WALLINGS				
	EXTERNAL WALLING				
	Supply and fix 150 mm thick natural chisel cut walling,jointed in cement and sand(1;3)morter and including hoop iron reinforcement at alternate courses including all necessary working around all door and windows openings formed accurately as per Architects schedule				
A	150mm thick walling	SM	29.0		
B	150mm thick Cable walls	SM			
	INTERNAL WALLING				
	Supply and fix 150 mm thick natural chisel cut walling,jointed in cement and sand(1;3)morter and including hoop iron reinforcement at alternate courses including all necessary working around all door and windows openings formed accurately as per Architects schedule				
B	150mm thick	SM	5.0		
	PCC COPING				
C	Supply and fix 550X550 Pcc coping twise weathered and throated fixed to concrete columns and painted to approval.	NO	5.0		
	Carried to summay				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	Element NO.4 **ROOF CONSTRUCTION** **MAIN ROOF -TIMBER TRUSSES** *Structural timber trusses in pressure impregnated treated sawn cypress including fabrication,jointing with necessary timber plates ,bolts and connecting plates,hoisting and fixing in position all in accordance with Engineers details and drawings* **100X50mm wall plate secured with and including 12mm diameter mild steel 'J'bolt**				
A	100x50mm thick at 1500mm centres cast in concrete ring beams	LM	15.0		
B	100x50mm principle rafters	LM	34.0		
C	Ditto but to tie beam / ceilling joist	LM	16.0		
D	100x50mm but common rafters	LM	23.0		
E	Ditto but king post	LM	4.0		
F	75 x 50 mm but struts and ties.	LM	32.0		
G	75x50mm purlins	LM	40.0		
	ROOF FINISHES AND COVERING				
H	Supply and fix gauge 30.0 pre-painted normal corrugated (11/3) Roof covering sheets at 25.0 degrees from horizontal from MRM or any other equal and approved by P.M fixed to timber purlins m/s and including all necessary accessories.	SM	18.0		
J	Down Pipes with solvent welded joints, fixed to walls with holderbolts size 100 x 100 mm or any other approved	LM	5.0		
K	Extraover for shoe in pipe , size' - 100 x 100 mm	No.	2.0		
	Carried Forward to summary of Section				

Item	Description	Unit	Qty	Rate *Kshs*	Amount *Kshs*
	Element NO.5 WINDOWS				
	Supply and fix the following purpose made standard 25mm 'Z'- section , 25mm T-sections, steel casement window fabricated to approved detailed designs: hooded mosquito proofed permanent vents: pin type hinges: : including all necessary cutting, welding, grinding, ironmongery one coat red oxide primer before fixing: window size				
A	window size 1500x1200mm high	NO	1.0		
B	window size 1200x600mm high	NO	1.0		
C	window size 800x600mm high	NO	1.0		
	window cill				
D	75mm cast insitu concrete cill in class 20 concrete	LM	3.0		
	Clear sheet glass				
E	5mm Glass and glazing to metal with putty in panes - 0.50 to 1.00 square metres	SM	2.0		
	PAINTING AND DECORATION				
F	Prepare and apply three coats of gloss oil paints to metal surface of window externally	SM	2.0		
G	ditto internally	SM	2.0		
	Carried Forward to summary of Section				

Item	Description	Unit	Qty	Rate	Amount Kshs
	Element NO.6				
	DOORS & IRON MONGERY-(Supply and fix items)				
	Timber doors				
	50mm thick solid hardwood panel doors comprising of standard panels with 300mm wide van light to Architects door schedule.				
A	Door size 900x2400mm high	No	1.0		
	Doors, frames and finishings in sawn cypruss timber to approval.				
B	150 x 50 mm thick door frame with 3 labours	LM	7.0		
C	40 x 25 mm architrave with one labour	LM	7.0		
D	25 mm quadrant	LM	7.0		
E	38 mm rubber door stop fixed with rawl bolts	NO	2.0		
F	100 mm steel butt hinges	Pairs	1.5		
G	Two lever door lock as per union catalouge ref 2237	NO	1.0		
H	125 x 25 x3mm thick wrought door fixing cramps	NO			
	Prepare and apply undercoat to :-				
J	Back of wood before fixing; not exceeding 100 mm girth	LM	7.0		
	Prepare and apply Three coats clear varnish paint to :-				
K	General surfaces of timber internally	SM	2.0		
L	Ditto externally	SM	2.0		
	STEEL DOORS				
	Supply and fix steel door comprising 40 x 40 x 1.5mm thick RHS frame all round with 40 x 40 x 1.5mm thick SHS middle rail; The door divided divided into panels by 40X25 x 1.5mm RHS framework infill with 1.5mm ms plate panels 1500m above the floor both sides and 300mm wide vanlight; , priming door after prefabrication and fixing to 50 x 50 x 2mm RHS thick frame plugged with approved mild steel hinges and all neccessary iron mongery				
M	Door size. 900x2100mm high to external walls	NO	1		
	Prepare and apply Two coats approved glosse paints to :-				
N	General surfaces of steel door internally	SM	2.0		
P	Ditto externally	SM	2.0		
	Total carried to summary				

Item	Description	Unit	Qnty	Rate	Amount
	BILL NO 8: PLUMBING & DRAINAGE INSTALLATIONS				
	All works to be carried out by the Qualified plumbing sub-contractor approved by the architech				
	WATER CLOSET				
A	Twyford' or equivalent water closet comprising WC pan,low level 9litres ceramic cistern side inlet internal overflow with valveless fittings:innlet connection;flush pipe and chrome plated lever;white plastic seat and cover;including fixing pan to floor and cistern to wall wiith screws and plugs	NO	1		
	WASH HAND BASIN				
B	Twyford or equivalent wash hand basin as semi-recessed vitreouswhite china(450 x 300mm) with two taphole,taps,chain,and waste 32mm C.P 32mm bottle trap with 75mm seal with 200mm tail piece,capnuts and wall flange,brackets including fixing	NO	1		
C	ditto soap dish	NO	1		
D	Mirror size 600 x450mm high bevelled edges on plywood backing fixed with C.P screws with dome covers;plugged to wall	NO	1		
E	25mm diameter crome plated towel rail 600mm long	NO	1		
E	Allow for storage water tank as 'KENTANK' or any other equal and approved tank, including 3No. Perforation (25mm,50mm,32mm diameter)	NO	1		
F	12mm diameter ball valve	NO	2		
F	Allow Provisional sums of **ksh ……...**for pipework and for testing of all plumbing works by water test	ITEM	1		
GH	Allow for testing of all plumbing works by water test	ITEM	1		
	Total carried to summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	Element NO.7 FINISHES				
	EXTERNAL WALL FINISHES				
A	Horizontal key pointing and verticle flash joint to external surface of walls.	SM	29.0		
B	15mm screed backing to receive weatherguard paint cable walls.	SM	-		
C	Ditto but to verticle sides of columns and ringbeams	SM	11.0		
	Prepare and apply one undercoat and two finishing coats acrylic paint or other approved by the architect				
D	Rendered walls externaly	SM	11.0		
	INTERNAL WALL FINISHES				
	16mm (minimum) cement sand (1:3) screed to receive ceramic tiles M.s.				
E	Steel trowelled smooth plasters to surfaces of wall to receive paint (m/s)	SM	39.0		
F	Wood trowelled plasters to surfaces of wall to receive paint m.s.	SM	14.0		
G	Steel trowelled smooth plasters to surfaces of, ring beams.	SM	11.0		
H	Ditto but to soffits of the Rc slab at the entrance gate with waterproof cement	SM	35.0		
J	Ditto but to sides soffits of the Rc gutters including water channel with approved waterproof cement to project manager's approval.	SM	26.0		
	PAINTING AND DECORATING				
	Prepare and apply three coats silk vinyl emulsion paint or other approved by Architect				
K	To plastered surfaces of walls	SM	39.0		
L	To plastered surfaces of, ring beams	SM	11.0		
	CERAMIC WALL TILES				
	330X330X6mm thick coloured ceramic wall tiles in approved pattern.				
M	To Walls in bathrooms	SM	14		
	INTERNAL FLOOR FINISHES				
	cement and sand (1:4) backing				
N	32mm thick cement and sand screed steel float finish with red oxide paint.	SM	34.0		
	Total carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	Coloured non-slip ceramic tiles as SAJ ceramic to floor of washrooms.				
A	Supply and fixed 330x330x8mm thick saj ceramic tiles bonded with an approved adhesive.	SM	16.0		
B	150mm high tile skirting	LM	24.0		
	CEILING FINISHES				
C	9mm thick Chipboard horizontal ceiling fixed to and including 50x50mm sawn cypress brandering at 600mm c/c both directions ,finishing joint with fibre tape and skimming before applying finishing coats of paint m/s.	SM	16.0		
D	Extra`over ceiling for trap door size 600x600mm	NO	1.0		
	Sawn cypress: pressure impregnated				
E	50 x 50mm Brandering to ceilings at 600mm centres both ways: plugged to walls where necessary	LM	85.0		
	CORNICE				
F	100X25mm cornice	LM	22.0		
	PAINTING AND DECORATING				
	Prepare and apply three coats matt emulsion paint or other and approved				
G	To surfaces of chipboard suspended ceiling	SM	16.0		
H	Ditto but to cornice	LM	22.0		
	Total carried to collection				
	COLLECTION				
1	**Total Brought Forward From Page No.12**				
2	**Total Brought Forward From above**				
	Carried Forward to Summary of Section No.				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	Element NO 8 **PC AND PROVISIONAL SUMS** **ELECTRICAL INSTALLATION**				
A	Allow a Provisional sum of **kshs 50,000** only for electrical instalations works including power connections	Item	1.0	50,000	
	Total carried to main summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	SECTION SUMMARY				
1	**Substructures works**				
2	**Reinforced concrete works**				
3	**External and internal walling**				
4	**Roof construction and covering**				
5	**Windows**				
6	**Doors and ironmongery**				
7	**Plumbing works**				
8	**External, internal wall and ceilling finishes**				
9	**Allow a pc sum for Electrical instalation works**				
	Summary for the proposed works Carried to main summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	STEEL GATE				
A	Purpose made mild steel gate overal size 5000x2100mm high in two(2) equal leaves fabricated from 75x50x3mm thick SHS braces and framed all round 50x50x3mm thick RHS middle rails and 25x25x2mm thick sections framing at 100mm centers and including all iron mongery and accessories and 4no. 100mm dia x4mm thick gate posts fixed to column and applying one coat of redoxide primer before delivery to site.	NO	1.0		
B	Pedestrian gate size 1200x2100mm high	NO	1.0		
C	Prepare surface and apply three coats of gloss oil paint on general metal surfaces (M/S)	SM	21.0		
	Total carried to collection				

Item	GRAND SUMMARY				
1	Gate house				
2	Fabrication of gate				
	SUB-TOTAL FOR 1NO UNIT OF GATE & GATE HOUSE				
	TOTAL COST FOR 2UNITS OF GATE HOUSES CARRIED TO COLLECTION				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	PROPOSED PERIMETER FENCE (ALL PROVISIONAL)				
	BILL NO.1				
A	Excavate Pit 300mm dia x 600mm deep to receive concrete fencing post spaced at 2.0m c/c including disposal of soil or set in spoil heaps and later spread around the site as directed.	NO	361		
B	Supply and fix 100X125mm precast reinforced concrete fencing post 3000mm long overal length with top end 450mm cranked and tapered with shaft five times drilled and cranked end three times drilled all for threading wire lines including casting into concrete (1;2;4) in pit spaced at 2.0m c/c	NO	361		
C	Ditto straining and strutting post bolted to main corner post including all bolts and ditto.	NO	25		
D	14gauge galvanised chain-linked wire fenceing 2100mm high from ground level secured to ground and including 12.0 gauge round wire liners or barbed wire (8NO) threaded through post (m/s) at equal verticle centers complete with black tying wire fixed.	SM	1,440		
E	12.5 Gauge Barbed wirebut 8No. Strands fixed with tying wires to crancked end at equal heights center to the concrete posts.	LM	5,760		
	MASS CONCRETE				
	Insitu mass concrete 1;3;6				
F	Footing of the chainlink and the ground level	CM	22		
	SAWN FORMWORK TO;				
G	Edges of mass concrete over 75mm but not exceeding 150mm high	LM	720		
	Total carried to collection				

Item	GRAND SUMMARY			Rate Kshs	Amount Kshs
	Proposed chainlink Fencing				
1	**Particular Preliminaries**				
2	**Proposed works**				
	TOTAL CARRIED TO SUMMARY				

	GRAND SUMMARY- GATE, GATE HOUSE & FENCE				
1	PROPOSED GATES & GATE HOUSE				
2	CHAINLINK FENCE				
	SUB-TOTALS				

	CIVIL WORKS				
1	**Paved drive-ways**				
2	**Landscapping works**				
3	**External furniture**				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	GROUNDWORK				
	EXCAVATING AND FILLING				
	Site preparation				
	Removing trees; filling voids left by removal of roots with selected material arising from excavation, Handing over the harvested Trees to the client.				
A	Girth Not exceeding 0.6m	1500	Nr		
	Clearing site vegetation; filling voids left by removal of roots with selected material arising from excavation				
B	bushes, scrub, undergrowth, hedges, trees and tree stumps not exceeding 600 girth	12244	m2		
	Excavating				
	Mass excavation To reduce levels and to remove cotton soil				
	To reduce levels				
C	Commencing from ground level and not exceeding 1.5m	18366	m3		
D	Commencing fom 1.5m and not exceeding 3.00 m	12244	m3		
	Disposal				
	Disposal of excavated material				
E	off site to approved Dumping sites about 4 km away	28461	m3		
	Disposal of excavated material deposited by piling specialist				
F	depositing on site in temporary spoil heaps located at contractor's discretion	2149	m3		
	To Collection				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	Selected excavated material obtained from on site spoil heaps Filling to make up levels; depositing in layers * maximum thickness				
A	average thickness not exceeding 0.25m	2149	m3		
	To Collection				
	Collection From Page EXT-WRKS/ / 2 From Above				
	GROUNDWORK Carried to Summary				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	CABRO PAVINGS				
	KERBS/ EDGINGS/CHANNELS				
	Precast concrete; standard or stock pattern units; B.S.7263; bedding jointing and pointing in cement mortar (1:3); on plain in-situ concrete foundation; as Specification E10.100				
	Kerbs; rectangular section; half battered type HB3; concrete foundation and haunching; formwork				
A	125 x 255 kerb; 275 x 150 foundation	68	m		
B	125 x 150 kerb; 300 x 150 foundation; curved * radius	34	m		
	Channels; plain rectangular section; type CS2; concrete foundation and haunching; formwork				
C	150 x 125 channel; 350 x 150 foundation; curved *m radius	387	m		
	Extra for quadrants; half battered type QHB; concrete foundation and haunching; formwork				
D	305 x 305 x 150 quadrant; 500 x 500 x 150 foundation	27	Nr		
	HARDCORE/GRANULAR/CEMENT BOUND BASES/SUB-BASES TO ROADS/PAVINGS				
	Hardcore to be obtained off site				
	Filling to excavation; depositing in layers 150mm maximum thickness				
E	average thickness not exceeding 0.4m	902	m3		
	Granular material type 1; DOT specification clause 803; to be obtained off site				
	Filling to make up levels; depositing in layers 300mm maximum thickness				
F	average thickness not exceeding 2.2m	6617	m3		
	To Collection				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	Granular material Quarry Dust to be obtained off site				
	Blinding to receive Cabro blocks				
A	average thickness not exceeding 50mm	3008	m2		
	Surface packing to filling				
	HEAVY DUTY CABRO BLOCKS:				
	Precast concrete paving blocks; 2 joints symmetrical half bond layout; covering with washed non-staining sand compacting with plate vibrator sweeping off surplus				
	HEXAGON units to roads on sand granular or blinded hardcore base				
B	80mm Thick; laid in pattern to falls and crossfalls and to slopes not exceeding 15 degrees from horizontal	3008	m2		
	ROAD MARKINGS AND THE LIKE				
	Line markings; to tarmacadam sufacings				
	White thermoplastic lining to BS 3262 Class A				
C	intermittent lines; 100 wide	329	m		
	SEEDING/TURFING				
	Cultivating				
	Surfaces of filling				
D	digging over one spit deep	1074	m2		
	Seeding				
	Organic Manure 0.06 kg/m²; raking in				
E	general surfaces	1074	m2		
	To Collection				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	Selective weedkiller 0.03 kg/m2; applying by spreader				
A	general surfaces	1074	m2		
	Imported turf; Planting KIKUYU Grass and maintaining for at least months after layer untill it is well established				
B	general surfaces	1074	m2		
	PLANTING				
	Surface applications; fertiliser				
	General surfaces				
C	Application and mixing of Organic manure	120	m2		
	Plants and planting				
	Trees				
D	1500mm high; [botanical name]	20	Nr		
	Shrubs				
E	1200mm high; [botanical name]	200	Nr		
	SITE/STREET FURNITURE/EQUIPMENT				
	Wrought iron				
	Pedestrian and vehicle barriers and railings				
F	(dimensioned description); as component drawing *	2	Nr		
	Prefabricated plant Gauge in mild steel Rods				
G	(dimensioned description); as component drawing	15	Nr		
	Benches				
H	(dimensioned description); as component drawing No.....	6	Nr		
	To Collection				

Item	Description	Qty	Unit	Rate Ksh	Total Ksh
	Litter bins				
A	(dimensioned description); as component drawing No.....	15	Nr		
	Flag Post				
B	(100mm diax 3m + 75mm x 3m Galvanized steel pipes class "B"); as component drawing ..... Including bedding in concrete	3	Nr		
	PRIME COST SUMS				
	Alow a Prime cost sum of ksh 5,000,000 for construction of Cabro Paved slip-road along Maihumahiu- kaplong road, to be executed by a nominated sub-contractor and to be executed under the supervision of Kenya National Highways Authority.	1	Item		
	Allow for Attendance	1	Sum		
	Allow for profits and overheads.	1	Sum		
	Allow a provisional sum of Ksh 1,000,000 for contigencies related to civil works	1	Item		
	To Collection				
	Collection From EXT-WRKS//4 EXT-WRKS//5 EXT-WRKS//6 From above				
	CABRO PAVINGS Carried to Summary				

					Total Ksh
	SECTION SUMMARY- EXTERNAL PAVEMENTS				
	Collection from:-				
	GROUNDWORK				
	CABRO PAVINGS				
	To Main Summary				

SUMMARY-ANCILLARIES

	SECTION 2- SUMMARY PAGE -				**Amount**
					KSH
	ANCILLARY WORKS		***FROM PAGE***		
1	FENCE, GATE & GATE HOUSE		*ANCIL- 18*		
2	EXTERNAL DRIVEWAYS, WALKWAYS, AND LANSCAPING WORKS		*Page EXT-WRKS/ / 8*		
	SUB-TOTALS FOR THE ANCILLARIES CARRIED TO THE MAIN SUMMARRY PAGE				

AMOUNT IN WORDS….....
….....

(SIGNATURE OF EMPLOYER)

NAME OF THE CONTRACTOR; ….....

ADDRESS: _____ ADDRESS: _____

NAME OF AUTHORIZED PERSON….....

DATE : _____ DATE : _____

SECTION 3

UTILITY SERVICES/WORKS

REPUBLIC OF KENYA

BOMET COUNTY.

Department of Roads,Transport & Public works

MECHANICAL AND ELECTRICAL WORKS FOR PROPOSED ANCILLARY WORKS FOR DR. JOYCE LABOSO MEMORIAL MOTHER & CHILD WELLNESS CENTRE TO BE FINANCED BY COUNTY GOVERNMENT OF BOMET

1.Clean Water supply to the facility

2.Clean Water treatment

3. Wastes Water treatment Plant

4.Rain Water Harvesting tank/Raw water storage tank

5. Incinerator equipment

6. Laundry equipment

7. Kitchen Gas and piping instalation works

8. Medical Gas Plant and system accessories

9.Operations theatre Air conditioning unit

10.0 Operations theatre Air conditioning unit

11.0 Radiology Air conditioning units

12.0 External clean and waste water reticulation

13.ELECTRICAL WORKS

14.0 STAND-BY GENERATOR

Priced Bill of quantities

ARCHITECT
PUBLIC WORKS
ARCHITECTS
BOMET COUNTY
P.O.BOX 496-20400,
BOMET.

STRUCTURAL ENGINEERS
PUBLIC WORKS
ENGINEERS
BOMET COUNTY
P.O.BOX 19-20400,
BOMET.

QUANTITY SURVEYORS
PUBLIC WORKS
SURVEYORS
BOMET COUNTY
P.O.BOX 19-20400,
BOMET.

8-Sep-21

REPUBLIC OF KENYA

BOMET COUNTY.

Department of Roads,Transport & Public works

PROPOSED GAS PLANT

AT MOTHER & CHILD WELLNESS CENTRE

Bill of quantities

ARCHITECT
PUBLIC WORKS
ARCHITECTS
BOMET COUNTY
P.O.BOX 496-20400,
BOMET.

STRUCTURAL ENGINEERS
PUBLIC WORKS
ENGINEERS
BOMET COUNTY
P.O.BOX 19-20400,
BOMET.

QUANTITY SURVEYORS
PUBLIC WORKS
SURVEYORS
BOMET COUNTY
P.O.BOX 19-20400,
BOMET.

07/Sep/21

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	PROPOSED GAS PLANT				
	BILL NO.1				
	SUBSTRUCTURES / PROVISIONAL				
	SITE CLEARANCE				
A	Clear site of bushes,shrubs and the like, grup up there root and burn the arisings	SM	59.00		
B	Excavate vegetable top soil average 150mm deep set aside in spoil heaps and later spread around the site as directed.	SM	59.00		
C	Excavate oversite commencing from stripped level but not exceeding 1.5m deep.	SM	53.00		
D	Excavate foundation trench not exceeding 1.50m deep commencing from stripped level and backfill	CM	37.00		
E	Ditto pits for column bases stock pile around site ,part backfill around trenches and spread around the site has directed.	CM	19.00		
	Rock excavation				
F	Extra over excavations in rocks irespective of type.	CM	-		
G	Allow for keeping excavations free from all water by pumping or otherwise	ITEM	1.00		
H	Allow for plunking and strutting sides of excavation trenches	ITEM	1.00		
	Disposal				
J	Load,wheel and cart away surplus soil.	CM	27.00		
	Hardcore filling				
K	Supply and fix 300mm thick Imported, Hand packed hardcore; watered and well compacted in 150mm thickness	SM	53.00		
L	50mm thick murram blinding to surfaces of hardcore	SM	53.00		
	Anti-termite treatment				
M	Termidor' or any other equal and approved chemical treatment to surfaces of blinded hardcore and around foundations; apply in accordance with manufacturers specification; provide a ten(10) written quarantee against termites	SM	53.00		
	Mesh fabric reinforcement to B.S 4483 and setting in concrete with 300mm side and end laps (measured nett-allow for laps)				
N	Fabric mesh ref:A98 weighing 0.54kg per square metre in floor bed	SM	53.00		
	Carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	DAMP PROOF MEMBRANE				
A	1000 gauge polythene damp proof memmbrane laid under surface bed with 300mm side and end laps (measured net -allow for laps)	SM	53.00		
	CONCRETE				
B	50mm thick concrete (1:4:8 mix) blinding under footings	SM	23.00		
C	Ditto but to column bases	SM	9.00		
	Insitu concrete class 20/20, vibrated and reinforced as described, in:-				
D	Column bases & Foundation Columns	CM	5.00		
E	350mm high groundbeams	CM	2.00		
F	strip footing	CM	4.00		
G	125mm thick surface bed	SM	53.00		
	Reinforcement bars ; high tensile steel to BS 4461 all in accordance with the Engineer's details and approval including all cutting,bending,laying and binding wire to;				
H	Column bases & Foundation Columns	Kg	600		
J	Groundbeams	Kg	240.00		
K	strip footing	Kg	160.00		
	FORMWORK				
N	Ditto but to vertical sides of sturbed columns and column bases;	SM	13.00		
P	Ditto but to vertical sides of strip footing of 175-225mm high.	LM	72.00		
Q	Edges of ground floor slab over 75mm but not exceeding 150mm high	LM	23.00		
	Foundation walls				
R	Supply and fix 200mm thick natural stone wall foundations bedded and jointed in c.s morta 1;4 with hoop iron bars at alternate course.	SM	29.00		
	DPC Three -ply bituminous felt damp proof course bedded in cement and sand morta(1;3)				
S	200mm Wide horizontal layer	LM	24.00		
	PLINTH FINISH				
	Cement and Sand 1:4 render				
T	12 mm thick render wood float	SM	11.00		
	Prepare and apply two coats bituminous paint to:				
U	Render surfaces externally	SM	11.00		
	Carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	COLLECTION				
1	**Total Brought Forward From Page No.1**				
2	**Total Brought Forward From Page No.2**				
	TOTAL CARRIED TO SUMMARY				-

Item	Description	Unit	Qty	Rate *Kshs*	Amount *Kshs*
	BILL NO.2				
	REINFORCED CONCRETE WORKS SUPERSTRUCTURE				
	Vibrated reinforced concrete (1;2;4) class 20 in;				
A	Columns	CM	1.00		
B	Beams	CM	2.00		
C	100mm thick RC gutters	SM	38.00		
	REINFORCEMENT				
	Reinforcement in different sizes in structural concrete work all in accordance with the Engineer's details and approval including all cutting,bending,laying and binding wire to;				
E	columns	Kg	100.00		
F	Beams	Kg	200.00		
G	Rc gutters	Kg	513		
	SAWN FORMWORK TO;				
H	Sides of vertical columns	SM	31.00		
J	Sides and of beams	SM	18.00		
K	Sides & Soffits of Rc gutters	SM	38.00		
L	Edges of suspended slabs over 75mm but not exceeding 150mm high	LM	34.00		
	Total Carried to summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.3				
	WALLINGS				
	EXTERNAL WALLING				
	Load bearing chisel cut natural stone walling (7N/mm, jointed in cement and sand(1;3)morter and including hoop iron reinforcement at alternate courses including all necessary working around all door and windows openings formed accurately as per Architects schedule				
A	200mm thick walling	SM	65.00		
B	Ditto but to cable wall	SM	-		
	Louvered Bricks				
C	Supply and fix clay louvered bricks (Kenya clay products) to an approved parten by the project manager jointed with c/s mo. 1;3 and painted to approval to staircase wall.	SM	21.00		
	Total Carried to summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.4				
	ROOF CONSTRUCTION AND COVERING				
	MAIN ROOF -STEEL TRUSSES TO THE MAIN HALL				
	Framed structural steel work, factory primed before delivery to site and to be executed by an approved specialist all including hoisting, welding and ground smooth all to project manager's approval.				
	Steel trusses				
A	50X50X3mm wall plate secured with and including 12mm diameter mild steel 'J'bolt	LM	24.0		
B	50 x 50 x3mm rectangular hollow section main rafter member/ principle rafters. Top & bottom chords.	LM	147.0		
C	40 x 40 x 3mm rectangular hollow sections to kingposts.	LM	46.0		
D	40 x 40 x 3mm square hollow section struts/ties	LM	76.0		
E	100 x 50 x 2mm "Z" purlins	LM	256		
F	12mm diameter sag rods threaded for and including nuts and washers and drilling holesthrough "Z" purlins	LM	350.0		
	Plates, Cleats, etc.				
G	6mm thick plate size 200 x 200 mm six times drilled for 8 mm diameter bolt	NO	22.0		
	Bolts and nuts to B. S. 4190				
H	9 mm diameter bolt 80 mm long with head, nut and two washers	NO	200.0		
J	16 mm ditto, 225 long with ditto	NO			
	ROOF FINISHES AND COVERING				
K	Supply and fix gauge 30.0 pre-painted normal corrugated (11/3) Roof covering sheets at 25.0 degrees from horizontal from MRM or any other equal and approved by P.M fixed to timber purlins m/s and including all necessary accessories.	SM	70.0		
	RAIN WATER DISPOSAL				
L	Supply and fix APP membrane to RC gutters all in accordance with architect drawings and approvals.	SM	22.00		
M	Down Pipes with solvent welded joints, fixed to walls with holderbolts size 100 x 100 mm or any other approved	LM	9.00		
N	Extraover for swan kneck in pipe , size' - 100 x 100 mm	No.	2.00		
P	Extraover for shoe in pipe , size' - 100 x 100 mm	No.	2.00		
	Carried Forward to summary of Section				

Item	Description	Unit	Qty	Rate	Amount Kshs
	BILL NO.5 **DOORS & IRON MONGERY-(Supply and fix items)**				
	ROLLER SHUTTER DOORS & IRON MONGERY-(Supply and fix items)				
A	Supply and fix 2.8m high x 3.00m wide roller shutter doos complete with manual rollers springs fixed with closing chain and painted with one undercoat paints before fixing and two coats of gloss paint to project managers approval.m.s	NO	1.00		
	Prepare and apply Three coats of gloss paints or any other approved paints to :-				
B	General surfaces of steel Doors internally	SM	9.00		
C	Ditto externally	SM	9.00		
	Total carried to summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.6 FINISHES				
	EXTERNAL WALL FINISHES				
	Key pointing				
A	Horizontal recess and verical flush pointing to walls externally	SM	65.00		
B	Wood trowelled plasters to surfaces of beams and cable ends to receive weatherguard paints.	SM	17.00		
	Prepare and apply two coats of weatherguard paint or other equal and approved by Architect to:				
C	To plastered surfaces of walls externaly.	SM	17.00		
	INTERNAL WALL FINISHES **12mm (minimum) cement sand (1:3) screed to receive ceramic tiles**				
D	15mm thick minimum Wood float plaster to walls to receive wall tiles m.s.	SM	65.00		
E	Steel trowelled smooth plasters to surfaces of wall to receive paint (m/s)	SM	65.00		
F	Steel trowelled smooth plasters to surfaces of,beams and columns	SM	34.00		
G	Steel trowelled smooth plasters to soffits surfaces of suspended slab	SM	38.00		
	PAINTING AND DECORATING **Prepare and apply three coats silk vinyl emulsion paint or other approved by Architect**				
H	To plastered surfaces of walls	SM	65.00		
J	To plastered surfaces of,beams and columns	SM	34.00		
K	To plastered surfaces soffits of suspended slab	SM	38.00		
	INTERNAL FLOOR FINISHES **cement and sand (1:4) backing**				
L	32mm thick cement and sand screed to recieve terrazo floor finish m.s	SM	53.00		
	Terrazo Floor finish				
M	Supply, deliver and fix 25mm thick Terrazo floor finish using white cement, including dividing stips grounded smooth and with approved colour to project manager's approval.	SM	53		
N	150mm high skirting	LM	56		
	Carried Forward to Summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO 7.				
	PC AND PROVISIONAL SUMS				
	ELECTRICAL INSTALATIONS WORKS				
A	Allow a Provisional sums of **kshs 45,000 only** for Electrical instalation works, to later details and approval.	Item	1.00	45,000	
	Total carried to main summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	SECTION SUMMARY				
1	**Substructures works**				
2	**Reinforced concrete works**				
3	**External and internal walling**				
4	**Roof construction and covering**				
5	**Doors and ironmongery**				
6	**External, internal wall and ceilling finishes**				
7	**PC & Provisional sums for Electrical works, Fire alarm systems external drainage works**				
	Total for Gas Plant House Carried to Section Collection Summary Page				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	PROPOSED GENERATOR HOUSE **BILL NO.1** **SUBSTRUCTURES / PROVISIONAL** **SITE CLEARANCE**				
A	Excavate vegetable top soil average 150mm deep set aside in spoil heaps and later spread around the site as directed.	SM	32		
B	Excavate oversite commencing from stripped level average depth 200mm but not exceeding 1.5m deep	SM	32		
C	Excavate foundation trench not exceeding 1.50m deep commencing from stripped level and backfill	CM			
D	Ditto but to column bases	CM	2		
E	Allow for keeping excavations free from all water by pumping or otherwise	ITEM	1		
F	**Disposal** Load,wheel and cart away surplus soil.	CM	35		
	Hardcore filling				
G	Imported hardcore, Hand packed; water and well compacted of 150mm thickness and minimum depth of 300mm.	SM	32		
H	50mm thick murram blinding to surfaces of hardcore	SM	32		
	Anti-termite treatment				
I	Termidor' or other equal and approved chemical treatment to surfaces of blinded hardcore and around foundations; apply in accordance with manufacturers specification; provide a ten(10) written quarantee against termites	SM	32		
	Carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	Mesh fabric reinforcement to B.S 4483 and setting in concrete with 300mm side and end laps (measured nett- allow for laps)				
A	Fabric mesh ref:A142weighing 2.22kg per square metre in floor bed	SM	32		
	DAMP PROOF MEMBRANE				
B	1000 gauge polythene damp proof memmbrane laid under surface bed with 300mm side and end laps (measured net - allow for laps)	SM	32		
	CONCRETE				
	50mm thick concrete (1:4:8 mix) blinding under;				
C	Column Bases	SM	6		
	Insitu concrete class 20/20, vibrated and reinforced as described, in:-				
D	Column Bases	CM	1		
E	Ditto but to foundation columns	CM	1		
F	Ditto but to 450mm high ground Beam	CM	2		
G	100mm thick V R C surface bed	SM	32		
	Reinforcement works all in accordance with the Engineer's details and approval including all cutting,bending,laying and binding wire to;				
H	Column bases and Foundation columns	Kg	164		
J	Ditto but to Ground Beams.	Kg	164		
	Carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	SAWN FORMWORK TO;				
A	Vertical sides of Ground Beam	SM	22		
B	Ditto but to Column bases and foundation columns	SM	8		
C	Edges of ground floor slab over 75mm but not exceeding 150mm high	LM	23		
	DPC **Three -ply bituminous felt damp proof course bedded in cement and sand morta(1;3)**				
D	200mm Wide horizontal layer	LM	24		
	PLINTH FINISH **Cement and Sand 1:4 render**				
E	12 mm thick render wood float	SM	10		
	Prepare and apply two coats bituminous paint to:				
F	Render surfaces externally	SM	10		
	Carried to collection				

Item	Description	Unit	Qty	Rate *Kshs*	Amount *Kshs*
	COLLECTION				
1	**Total Brought Forward From Page No.1**				
2	**Total Brought Forward From Page No.2**				
3	**Total Brought Forward From Page No. 3**				
	TOTAL CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate *Kshs*	Amount *Kshs*
	REINFORCED CONCRETE WORKS				
	SUPERSTRUCTURE				
	BILL NO. 2				
	Vibrated reinforced concrete (1;2;4) class 25 in;				
A	Ditto but to Ring Beams.	CM	1.5		
	REINFORCEMENT (ALL PROVISIONAL)				
	Reinforcement in different sizes in structural concrete work all in accordance with the Engineer's details and approval including all cutting,bending,laying and binding wire to;				
B	Ditto but to Ring Beams.	KG	123		
	SAWN FORMWORK TO;				
C	Ditto but to Ring Beams.	SM	14		
	Carried to summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.3 **LOAD BEARING WALLINGS** ***EXTERNAL WALLING*** **Load bearing machine cut natural stone walling,jointed in cement and sand(1;3)morter and including hoop iron reinforcement at alternate courses including all necessary working around all door and windows openings formed accurately as per Architects schedule**				
A	200mm thick walling	SM	39		
B	200mm thick Cable walls	SM	6		
C	200mm thick lovre walling	SM	9		
	INTERNAL WALLING Load bearing machine cut natural stone walling,jointed in cement and sand(1;3) mortar and including hoop-iron reinforcement at alternate courses,including all necessary working around all door and window openings formed accurately as per Architect schedule.				
C	200mm thick	SM			
	Carried to summay				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.4				
	ROOF CONSTRUCTION				
	MAIN ROOF -TIMBER TRUSSES				
	Structural timber trusses in pressure impregnated treated sawn cypress including fabrication,jointing with necessary timber plates ,bolts and connecting plates,hoisting and fixing in position all in accordance with Engineers details and drawings				
	100X50mm wall plate secured with and including 12mm diameter mild steel 'J'bolt				
A	100x50mm thick at 1500mm centres cast in concrete ring beams	LM	12		
B	100x50mm principle rafters	LM	20		
C	Ditto but to tie beam / ceilling joist	LM	34		
D	100x50mm but common rafters	LM	24		
E	Ditto but king post	LM	12		
F	75 x 50 mm but struts and ties.	LM	48		
G	75x50mm purlins	LM	54		
	Carried to collection				

Item	Description	Unit	Qty	Rate *Kshs*	Amount *Kshs*
	ROOF FINISHES AND COVERING				
A	Supply and fix quage 28g MRM Resincoat 11/3 prepainted Roof covering or equally approved at 15.0 degrees from horizontal including all necessary timber battens and fixtures Lean-to roof.	SM	54		
B	Ditto;Ridge caps	LM	7		
	Wrot timber selected and kept clean				
C	225x25mm Fascia and barge board	LM	30		
	Prepare and apply Three coats gloss paint to :-				
D	knot prime and stop and apply three coats of gloss oil paints to General surfaces of timber 100 to 200mm girth externally	LM	30		
	Carried to collection				

Item	Description	Unit	Qty	Rate *Kshs*	Amount *Kshs*
	COLLECTION		**Page *No***		
1	**Total Brought Forward From Page No.7**				
2	**Total Brought Forward From page No 8**				
	Carried Forward to summary of Section				

Item	Description	Unit	Qty	Rate	Kshs
	BILL NO.5				
	DOORS				
	Steel doors				
	Purpose made steel door size 900X2100mm high consisting of 40X40X3mm thick RHS frames and rails lined on both sides with gauge 18 sheet metal and 50X50X6mm thick angle frames plugged to masonry wall finished with one coat of red oxide complete with necessary iron mongery	6,000			
A	Door size 3000 x 2400mm,Double leaf	1	No		
	Painting and decorations				
	Prepare surfaces and apply one coat (undercoat) and two coats gloss oil paint as "Crown Paints" or other equal approved on metal surfaces to:				
B	Door;general surfaces metal (measured flat overall both sides)	14	SM		
	Total carried to summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.6 FINISHES				
	EXTERNAL WALL FINISHES				
A	Horizontal key pointing and verticle flash joint to external surface of walls.	SM	32		
B	15mm screed backing to receive weatherguard paint cable walls.	SM	6		
C	Ditto but to verticle sides of columns and ringbeams	SM	7		
	Prepare and apply one undercoat and two finishing coats acrylic paint or other approved by the architect				
D	Rendered walls externaly	SM	13		
	INTERNAL WALL FINISHES				
	12mm (minimum) cement sand (1:3) screed to receive ceramic tiles				
E	Steel trowelled smooth plasters to surfaces of wall to receive paint (m/s)	SM	58		
F	Steel trowelled smooth plasters to surfaces of, ring beams.	SM	7		
	PAINTING AND DECORATING				
	Prepare and apply three coats silk vinyl emulsion paint or other approved by Architect				
G	To plastered surfaces of walls	SM	58		
H	To plastered surfaces of, ring beams	SM	7		
	INTERNAL FLOOR FINISHES				
	cement and sand (1:4) backing				
J	32mm thick cement and sand screed steel float finish with red oxide paint.	SM	32		
K	150mm high concrete skirting	LM	24		
	Carried Forward to Summary of Section No.				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO 7 **PC AND PROVISIONAL SUMS** **ELECTRICAL INSTALLATION**				
A	Allow a pc sum of **kshs 50,000.** only for electrical instalations.	Item	1		
	Total carried to main summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	SECTION SUMMARY				
1	**Substructures works**				
2	**Reinforced concrete works**				
3	**External and internal walling**				
4	**Roof construction and covering**				
5	**Doors and ironmongery**				
6	**External, internal wall and ceilling finishes**				
7	**Allow a pc sum for Electrical instalation works**				
	Total for the proposed Generator House Carreid To Section Collection Page				

REPUBLIC OF KENYA

BOMET COUNTY.
Department of Roads,Transport & Public works

PROPOSED INCINERATOR

AT MOTHER & CHILD WELLNESS CENTRE

Bill of quantities

ARCHITECT
PUBLIC WORKS
ARCHITECTS
BOMET COUNTY
P.O.BOX 496-20400,
BOMET.

STRUCTURAL ENGINEERS
PUBLIC WORKS
ENGINEERS
BOMET COUNTY
P.O.BOX 19-20400,
BOMET.

QUANTITY SURVEYORS
PUBLIC WORKS
SURVEYORS
BOMET COUNTY
P.O.BOX 19-20400,
BOMET.

08/Sep/21

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	PROPOSED INCINIRATOR HOUSES				
	BILL NO.1				
	SUBSTRUCTURES / PROVISIONAL				
	SITE CLEARANCE				
A	Clear site of bushes,shrubs and the like, grup up there root and burn the arisings	SM	81		
B	Excavate vegetable top soil average 150mm deep set aside in spoil heaps and later spread around the site as directed.	SM	81		
C	Excavate oversite commencing from stripped level but not exceeding 1.5m deep.	SM	73		
D	Excavate foundation trench not exceeding 1.50m deep commencing from stripped level and backfill	CM	44		
E	Ditto pits for column bases stock pile around site ,part backfill around trenches and spread around the site has directed.	CM	19		
	Rock excavation				
F	Extra over excavations in rocks irespective of type.	CM	15		
G	Allow for keeping excavations free from all water by pumping or otherwise	ITEM	1		
H	Allow for plunking and strutting sides of excavation trenches	ITEM	1		
	Disposal				
J	Load,wheel and cart away surplus soil.	CM	37		
	Hardcore filling				
K	Supply and fix 300mm thick Imported, Hand packed hardcore; watered and well compacted in 150mm thickness	SM	73.0		
L	50mm thick murram blinding to surfaces of hardcore	SM	73		
	Anti-termite treatment				
M	Termidor' or any other equal and approved chemical treatment to surfaces of blinded hardcore and around foundations; apply in accordance with manufacturers specification; provide a ten(10) written quarantee against termites	SM	73		
	Mesh fabric reinforcement to B.S 4483 and setting in concrete with 300mm side and end laps (measured nett-allow for laps)				
N	Fabric mesh ref:A142 weighing 2.22kg per square metre in floor bed	SM	73		
	Carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	DAMP PROOF MEMBRANE				
A	1000 gauge polythene damp proof memmbrane laid under surface bed with 300mm side and end laps (measured net -allow for laps)	SM	73		
	CONCRETE				
B	50mm thick concrete (1:4:8 mix) blinding under footings	SM	29		
C	Ditto but to column bases	SM	13		
	Insitu concrete class 20/20, vibrated and reinforced as described, in:-				
D	Column bases & Foundation Columns	CM	5		
E	400mm high groundbeams	CM	4		
F	strip footing	CM	6		
G	125mm thick surface bed	SM	73		
	Reinforcement bars ; high tensile steel to BS 4461 all in accordance with the Engineer's details and approval including all cutting,bending,laying and binding wire to;				
H	Column bases & Foundation Columns	Kg	600		
J	Groundbeams	Kg	480		
K	strip footing	Kg	240		
	FORMWORK				
N	Ditto but to vertical sides of sturbed columns and column bases;	SM	20		
P	Ditto but to vertical sides of strip footing of 175-225mm high.	LM	97		
Q	Edges of ground floor slab over 75mm but not exceeding 150mm high	LM	34		
	Foundation walls				
R	Supply and fix 200mm thick natural stone wall foundations bedded and jointed in c.s morta 1;4 with hoop iron bars at alternate course.	SM	58		
	DPC Three -ply bituminous felt damp proof course bedded in cement and sand morta(1;3)				
S	200mm Wide horizontal layer	LM	42		
	PLINTH FINISH **Cement and Sand 1:4 render**				
T	12 mm thick render wood float	SM	19		
	Prepare and apply two coats bituminous paint to:				
U	Render surfaces externally	SM	19		
	Carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	COLLECTION				
1	**Total Brought Forward From Page No.1**				
2	**Total Brought Forward From Page No.2**				
	TOTAL CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate *Kshs*	Amount *Kshs*
	BILL NO.2				
	REINFORCED CONCRETE WORKS SUPERSTRUCTURE				
	Vibrated reinforced concrete (1;2;4) class 20 in;				
A	Columns	CM	2		
B	Beams	CM	3		
C	100mm thick RC. Gutters	SM	28		
D	150mm thick suspended slab to 3rd floor to carry water Tank.	SM	-		
	REINFORCEMENT				
	Reinforcement in different sizes in structural concrete work all in accordance with the Engineer's details and approval including all cutting,bending,laying and binding wire to;				
E	columns	Kg	200		
F	Beams	Kg	300		
G	Rc gutters	Kg	378		
	SAWN FORMWORK TO;				
H	Sides of vertical columns	SM	310		
J	Sides and of beams	SM	229		
K	Soffits of slabs	SM	28		
L	Edges of suspended slabs over 75mm but not exceeding 150mm high	LM			
	Total Carried to summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.3				
	WALLINGS				
	EXTERNAL WALLING				
	Load bearing chisel cut natural stone walling (7N/mm, jointed in cement and sand(1;3)morter and including hoop iron reinforcement at alternate courses including all necessary working around all door and windows openings formed accurately as per Architects schedule				
A	200mm thick walling	SM	162		
B	Ditto but to cable wall	SM	-		
	INTERNAL WALLING				
	Load bearing chisel cut natural stone walling (7N/mm, jointed in cement and sand(1;3)morter and including hoop iron reinforcement at alternate courses including all necessary working around all door and windows openings formed accurately as per Architects schedule				
C	150mm thick	SM	42		
	Louvered Bricks				
D	Supply and fix clay louvered bricks (Kenya clay products) to an approved parten by the project manager jointed with c/s mo. 1;3 and painted to approval to staircase wall.	SM	10		
	Total Carried to summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.4				
	ROOF CONSTRUCTION AND COVERING				
	BILL NO.4				
	MAIN ROOF -STEEL TRUSSES TO THE MAIN HALL				
	Framed structural steel work, factory primed before delivery to site and to be executed by an approved specialist all including hoisting, welding and ground smooth all to project manager's approval.				
	Steel trusses				
A	50X50X3mm wall plate secured with and including 12mm diameter mild steel 'J'bolt	LM	40.0		
B	50 x 50 x3mm rectangular hollow section main rafter member/ principle rafters. Top & bottom chords.	LM	155.0		
C	40 x 40 x 3mm rectangular hollow sections to kingposts.	LM	46.0		
D	40 x 40 x 3mm square hollow section struts/ties	LM	76.0		
E	100 x 50 x 2mm "Z" purlins	LM	256		
F	12mm diameter sag rods threaded for and including nuts and washers and drilling holesthrough "Z" purlins	LM	350.0		
	Plates, Cleats, etc.				
G	6mm thick plate size 200 x 200 mm six times drilled for 8 mm diameter bolt	NO	22.0		
	Bolts and nuts to B. S. 4190				
H	9 mm diameter bolt 80 mm long with head, nut and two washers	NO	200.0		
	ROOF FINISHES AND COVERING				
J	Supply and fix gauge 28.0 pre-painted normal corrugated (11/3) Roof covering sheets at 25.0 degrees from horizontal from MRM or any other equal and approved by P.M fixed to timber purlins m/s and including all necessary accessories.	SM	101		
	RAIN WATER DISPOSAL				
K	Supply and fix APP membrane to RC gutters all in accordance with architect drawings and approvals.	LM	42		
L	Down Pipes with solvent welded joints, fixed to walls with holderbolts size 100 x 100 mm or any other approved	LM	15		
M	Extraover for swan kneck in pipe , size' - 100 x 100 mm	No.	2		
N	Extraover for shoe in pipe , size' - 100 x 100 mm	No.	2		
	Carried Forward to summary of Section				

Item	Description	Unit	Qty	Rate *Kshs*	Amount *Kshs*
	BILL NO.5 WINDOWS				
	Supply and fix the following purpose made standard 25mm 'Z'-section , 25mm T-sections, steel casement window fabricated to approved detailed designs: hooded mosquito proofed permanent vents: pin type hinges: : including all necessary cutting, welding, grinding, ironmongery one coat red oxide primer before fixing: window size				
A	window size 2200x1400mm high	NO	3		
	Steel casement windowssecti including mullions,5mm thick obscured glass window stays,fasteners all to architect's schedule and approval				
B	800x600mm high ditto	NO	1		
	pelmet boxes in wrot mahogany timber or any other approve timber by the project manager.				
E	50x25mm bearer plugged	LM	6		
F	150x25mm top with one labour	LM	6		
G	150x25mm fascia with two labours	LM	6		
H	Boxed end to 150x150mm pelmet	NO	6		
J	twyfords curtain rail complete with rollers	LM	6		
	window cill				
K	75mm precast concrete cill in class 20 concrete	LM	7		
	PAINTING AND DECORATION				
N	Prepare and apply three coats of gloss oil paints to metal surface of window externally	SM	9		
P	ditto internally	SM	9		
	Carried Forward to summary of Section				

Item	Description	Unit	Qty	Rate	Amount Kshs
	BILL NO.6				
	DOORS & IRON MONGERY-(Supply and fix items)				
	Timber doors				
	50mm thick hardwood panel doors comprising of standard panels with 300mm wide van light to Architects door schedule and approval.				
A	Door double leaf size 1500x2400mm high	No	-		
B	Door leaf size 900x2400mm high to main entrance	No	1.0		
	45 mm Solid core flush doors faced both sides with 6 mm plywood ordinary for polishing , moulded and lipped all round, size ;				
C	900x2400mm	No.			
D	900x2100mm	No.	1		
	Doors, frames and finishings in wrot hardwood timber frames to P.M approval				
E	150 x 50 mm thick door frame with 3 labours	LM	12		
F	40 x 25 mm hardwood architrave with one labour	LM	12		
G	25 mm quadrant	LM	12		
H	38 mm rubber door stop fixed with rawl bolts	NO	1		
J	150 x3mm thick stainless steel butt hinges	Pairs	3		
K	Ditto but double swing hinges	Pairs			
	Supply and fix the following 'brass' ironmongery as 'Union' catalogue or equal and approved: from Assa Abloy (EA) Ltd: allow for matching handles, screws and fixing accessories				
L	Two lever mortice lock complete with fittings Union 2237	NO	1		
M	Indicator bolt to washrooms	NO	1		
N	125 x 25 x3mm thick wrought door fixing cramps	NO			
	ROLLER SHUTTER DOORS & IRON MONGERY-(Supply and fix items)				
P	Supply and fix 2.8m high x 3.00m wide roller shutter doos complete with manual rollers springs fixed with closing chain and painted with one undercoat paints before fixing and two coats of gloss paint to project managers approval.m.s	NO	1.00		
	Prepare and apply Three coats of gloss paints or any other approved paints to :-				
Q	General surfaces of steel Doors internally	SM	9.00		
R	Ditto externally	SM	9.00		
	Total carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
A	Back of wood before fixing; not exceeding 100 mm girth but not exceeding 200mm girth	LM	12.0		
	Prepare and apply Three coats clear varnish paint or any other approved paints to :-				
B	General surfaces of timber Doors internally	SM	4.0		
C	Ditto externally	SM	4.0		
	Steel door				
	Supply assemble & fix the following purpose made in heavy duty 20 x 20mm 'Z' & 'T' -sections, 4mm thick; metric W20 range; fabricated to approved detailed designs; 60 x 40 x 3mm framing complete with beading: cottage style, small panelled; 200 x 300mm equal panes; glazed in 6mm bronze tinted glass: hooded mosquito proofed permanent vents,pin type hinges; 12mm Square mild steel bars, welded in approved pattern; to match profile of door frames including all necessary cutting, welding, grinding, ironmongery from 'Kensmetal Ltd'; and one coat red oxide primer before fixing.				
E	1200 x 2400mm High to kitchen yard and roof slab	No.	1		
	Prepare and apply Three coats of gloss paints or any other approved paints to :-				
F	General surfaces of steel Doors internally	SM	3.0		
G	Ditto externally	SM	3.0		
	Total carried to collection				
	COLLECTION				
1	**Brought forward from page NO.11**				
2	**Brought forward from above**				
	Total carried to summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.7 FINISHES				
	EXTERNAL WALL FINISHES				
	Key pointing				
A	Horizontal recess and verical flush pointing to walls externally	SM	162		
B	Wood trowelled plasters to surfaces of beams and cable ends to receive weatherguard paints.	SM	-		
	Prepare and apply two coats of weatherguard paint or other equal and approved by Architect to:				
C	To plastered surfaces of walls externaly.	SM	-		
	INTERNAL WALL FINISHES				
	12mm (minimum) cement sand (1:3) screed to receive ceramic tiles				
D	15mm thick minimum Wood float plaster to walls to receive wall tiles m.s.	SM	217		
E	Steel trowelled smooth plasters to surfaces of wall to receive paint (m/s)	SM	29		
F	Steel trowelled smooth plasters to surfaces of,beams and columns	SM	384		
G	Steel trowelled smooth plasters to soffits surfaces of suspended slab	SM	28		
	PAINTING AND DECORATING				
	Prepare and apply three coats silk vinyl emulsion paint or other approved by Architect				
H	To plastered surfaces of walls	SM	29		
J	To plastered surfaces of,beams and columns	SM	384		
K	To plastered surfaces soffits of suspended slab	SM	28		
	CERAMIC WALL TILES				
	330X330X6mm thick coloured ceramic wall tiles in approved pattern.				
L	To Walls in bathrooms and washrooms.	SM	15		
	INTERNAL FLOOR FINISHES				
	Terrazo Floor finish				
N	Supply, deliver and fix 25mm thick Terrazo floor finish using white cement, including all the necessary cement sand screads, dividing stips grounded smooth and with approved colour to project manager's approval.	SM	73		
P	150mm high skirting	LM	56		
	Total carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	CEILING FINISHES				
A	12mm thick chipboard horizontal ceiling fixed to and including 50x50mm sawn cypress brandering at 600mm c/c both directions ,finishing joint with fibre tape and skimming before applying finishing coats of paint	SM	73		
B	Extra`over ceiling for trap door size 600x600mm	NO	4		
	Sawn cypress: pressure impregnated				
C	50 x 50mm Brandering to ceilings at 600mm centres both ways: plugged to walls where necessary	LM	230		
	CORNICE				
D	150X25mm cornice	LM	56		
	PAINTING AND DECORATING				
	Prepare and apply three coats matt emulsion paint or other and approved				
E	To surfaces of chipboard suspended ceiling	SM	73		
D	Ditto to 150X25mm cornice surface.	LM	56		
	Total carried to collection				
	COLLECTION				
1	**Total Brought Forward From Page No.13**				
2	**Total Brought Forward From above**				
	Carried Forward to Summary				

Item	Description	Unit	Quantity	Rate	Amount
	BILL NO 8.: PLUMBING & DRAINAGE INSTALLATIONS				
	All works to be carried out by the registered plumbing sub-contractor approved by the project manager.				
	WATER CLOSET				
A	Twyford' or equivalent water closet comprising WC pan,low level 9litres cistern side inlet internal overflow with valveless fittings:innlet connection;flush pipe and chrome plated lever;white plastic seat and cover;including fixing pan to floor and cistern to wall wiith screws and plugs	NO	1		
B	Ditto but dissable toilets	NO			
	WASH HAND BASIN				
C	Twyford or equivalent wash hand basin as semi-recessed vitreouswhite china(450 x 300mm) with two taphole,taps,chain,and waste 32mm C.P 32mm bottle trap with 75mm seal with 200mm tail piece,capnuts and wall flange,brackets including fixing	NO	1		
D	White vitreous china recessed toilet roll holder	NO	1		
E	ditto soap dish	NO	1		
F	Mirror size 600 x450mm high bevelled edges on plywood backing fixed with C.P screws with dome covers;plugged to wall	NO	1		
G	25mm diameter crome plated towel rail 600mm long	NO			
	Pipe works & drainage works				
D	Allow the Provisinal sum of Kenya shillings …….(Ksh.25,000-) only for pipeworks, taps all fittings and fixtures drainage works including excavation of a soak pit as directed on site	ITEM	1.0		
	Carried Forward to Summary of Section				

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	ELECTRICAL INSTALATION WORKS				
	Supply, install test and commision the followings:				
1	Lighting point wired using 3X1.5 sq. mm single core PVC cable drawn in 20 mm PVC conduits	56	NO	1,900	
2	6A, 1 gang 1 way switch complete with mounting box (MK)	2	NO	350	
3	6A, 2 gang 2 way switch complete with mounting box (MK)	19	NO	430	
4	6A, 4 gang 1 way switch complete with mounting box (MK)	1	NO	460	
5	36 watts fluorescent light fittings	48	N0	2,200	
6	Ball fittings complete with 18 watts energy saving lamp	4	NO	950	
7	Bulkhead light fittings complete with 18 watts energy saving lamp	4	NO	1,100	
8	Powerpoint wired using 3X2.5 sq. mm single core PVC cable drawn in 20 mm PVC conduits	32	NO	3,200	
9	13 A, double switched socket outlet complete with mounting box (MK)	32	NO	500	
10	Two core 6.0 sq. mm PVC cable drawn in 20 mm PVC conduits so as to link consumer units	85	M	360	
11	10 A MCB	11	NO	1,000	
12	16 A MCB	8	NO	1,000	
13	10 A MCB	4	NO	1,000	
14	6 way consumer unit (CCU)	4	NO	4,800	
15	6-way distribution board	1	NO	20,000	
16	Earthing comprising the following:				
i	Pure copper earth electrode	4	NO	1,100	
ii	6.0 mm sq. PVC earth cable	60	M	1,000	
17	80 A KMPG (original)	1	NO	1,000	
18	63 A MCB	4	NO	1,500	
	Total carried forward to collection				

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
1	**Fire Fighting Equipment and fire Alarm system**				
A	Provide a P.C sum of **Kshs. 100,000. Only** for Fire fighting equipments		1	100,000	
B	Add for profit				
C	Allow for attendance and builder's work (Subject to proportional adjustment)	SUM	1		
	Total carried forward to summary page				
	COLLECTION PAGE				
1	**Brought forward from Page 1**			**Ksh.**	
2	**Brought forward from above**			**Ksh.**	
	TOTAL SUM FOR I FLOOR			**Ksh.**	
	Total for 5no floors				
	TOTAL SUM FOR ELECTRICAL WORKS				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO 9.				
	PC AND PROVISIONAL SUMS				
	ELECTRICAL INSTALATIONS WORKS				
A	Allow a Provisional sums of **kshs 50,000 only** for Electrical instalation works, to later details and approval.	Item	1		
	Total carried to main summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	SECTION SUMMARY				
1	**Substructures works**				
2	**Reinforced concrete works**				
3	**External and internal walling**				
4	**Roof construction and covering**				
5	**Windows**				
6	**Doors and ironmongery**				
7	**External, internal wall and ceilling finishes**				
8	**Plumbing works, fittings and fixtures**				
9	**Provisional sums**				
	Total for the Generator House Carried To Section Collection Page				

REPUBLIC OF KENYA

BOMET COUNTY.

Department of Roads,Transport & Public works

PROPOSED KITCHENN & LAUNDRY

AT MOTHER & CHILD WELLNESS CENTRE

Bill of quantities

ARCHITECT
PUBLIC WORKS
ARCHITECTS
BOMET COUNTY
P.O.BOX 496-20400,
BOMET.

STRUCTURAL ENGINEERS
PUBLIC WORKS
ENGINEERS
BOMET COUNTY
P.O.BOX 19-20400,
BOMET.

QUANTITY SURVEYORS
PUBLIC WORKS
SURVEYORS
BOMET COUNTY
P.O.BOX 19-20400,
BOMET.

08/Sep/21

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	PROPOSED KITCHEN & LAUNDRY				
	BILL NO.1				
	SUBSTRUCTURES / PROVISIONAL				
	SITE CLEARANCE				
A	Clear site of bushes,shrubs and the like, grup up there root and burn the arisings	SM	328		
B	Excavate vegetable top soil average 150mm deep set aside in spoil heaps and later spread around the site as directed.	SM	328		
C	Excavate oversite commencing from stripped level but not exceeding 1.5m deep.	SM	304		
D	Excavate foundation trench not exceeding 1.50m deep commencing from stripped level and backfill	CM	124		
E	Ditto pits for column bases stock pile around site ,part backfill around trenches and spread around the site has directed.	CM	80		
	Rock excavation				
F	Extra over excavations in rocks irespective of type.	CM	61		
G	Allow for keeping excavations free from all water by pumping or otherwise	ITEM	1		
H	Allow for plunking and strutting sides of excavation trenches	ITEM	1		
	Disposal				
J	Load,wheel and cart away surplus soil.	CM	132		
	Hardcore filling				
K	Supply and fix 300mm thick Imported, Hand packed hardcore; watered and well compacted in 150mm thickness	SM	304		
L	50mm thick murram blinding to surfaces of hardcore	SM	304		
	Anti-termite treatment				
M	Termidor' or any other equal and approved chemical treatment to surfaces of blinded hardcore and around foundations; apply in accordance with manufacturers specification; provide a ten(10) written quarantee against termites	SM	304		
	Mesh fabric reinforcement to B.S 4483 and setting in concrete with 300mm side and end laps (measured nett-allow for laps)				
N	Fabric mesh ref:A142 weighing 2.22kg per square metre in floor bed	SM	304		
	Carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	DAMP PROOF MEMBRANE				
A	1000 gauge polythene damp proof memmbrane laid under surface bed with 300mm side and end laps (measured net -allow for laps)	SM	304		
	CONCRETE				
B	50mm thick concrete (1:4:8 mix) blinding under footings	SM	83		
C	Ditto but to column bases	SM	53		
	Insitu concrete class 20/20, vibrated and reinforced as described, in:-				
D	Column bases & Foundation Columns	CM	21		
E	400mm high groundbeams	CM	7		
F	strip footing	CM	13		
G	125mm thick surface bed	SM	304		
	Reinforcement bars ; high tensile steel to BS 4461 all in accordance with the Engineer's details and approval including all cutting,bending,laying and binding wire to;				
H	Column bases & Foundation Columns	Kg	2,520		
J	Groundbeams	Kg	840		
K	strip footing	Kg	520		
	FORMWORK				
N	Ditto but to vertical sides of sturbed columns and column bases;	SM	81		
P	Ditto but to vertical sides of strip footing of 175-225mm high.	LM	274		
Q	Edges of ground floor slab over 75mm but not exceeding 150mm high	LM	92		
	Foundation walls				
R	Supply and fix 200mm thick natural stone wall foundations bedded and jointed in c.s morta 1;4 with hoop iron bars at alternate course.	SM	165		
	DPC Three -ply bituminous felt damp proof course bedded in cement and sand morta(1;3)				
S	200mm Wide horizontal layer	LM	151		
	PLINTH FINISH **Cement and Sand 1:4 render**				
T	12 mm thick render wood float	SM	68		
	Prepare and apply two coats bituminous paint to:				
U	Render surfaces externally	SM	68		
	Carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	COLLECTION				
1	**Total Brought Forward From Page No.1**				
2	**Total Brought Forward From Page No.2**				
	TOTAL CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate *Kshs*	Amount *Kshs*
	BILL NO.2				
	REINFORCED CONCRETE WORKS SUPERSTRUCTURE				
	Vibrated reinforced concrete (1;2;4) class 20 in;				
A	Columns	CM	7		
B	Beams	CM	9		
C	100mm thick RC gutters	SM	77		
	REINFORCEMENT				
	Reinforcement in different sizes in structural concrete work all in accordance with the Engineer's details and approval including all cutting,bending,laying and binding wire to;				
D	columns	Kg	700		
E	Beams	Kg	900		
F	Solid suspended slab	Kg	1,040		
	SAWN FORMWORK TO;				
G	Sides of vertical columns	SM	111		
H	Sides and of beams	SM	91		
I	Soffits of slabs	SM	77		
J	Edges of suspended slabs over 75mm but not exceeding 150mm high	LM			
	Total Carried to summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.3				
	WALLINGS				
	EXTERNAL WALLING				
	Load bearing chisel cut natural stone walling (7N/mm, jointed in cement and sand(1;3)morter and including hoop iron reinforcement at alternate courses including all necessary working around all door and windows openings formed accurately as per Architects schedule				
A	200mm thick walling	SM	174		
B	Ditto but to cable wall	SM	-		
	INTERNAL WALLING				
	Load bearing chisel cut natural stone walling (7N/mm, jointed in cement and sand(1;3)morter and including hoop iron reinforcement at alternate courses including all necessary working around all door and windows openings formed accurately as per Architects schedule				
C	200mm thick	SM	149		
D	100mm thick	SM	-		
	Total Carried to summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.4				
	ROOF CONSTRUCTION AND COVERING				
	BILL NO.4				
	MAIN ROOF -STEEL TRUSSES TO THE MAIN HALL				
	Framed structural steel work, factory primed before delivery to site and to be executed by an approved specialist all including hoisting, welding and ground smooth all to project manager's approval.				
	Steel trusses				
A	50X50X3mm wall plate secured with and including 12mm diameter mild steel 'J'bolt	LM	90		
B	50 x 50 x3mm rectangular hollow section main rafter member/ principle rafters. Top & bottom chords.	LM	508		
C	40 x 40 x 3mm rectangular hollow sections to kingposts.	LM	60		
D	40 x 40 x 3mm square hollow section struts/ties	LM	484		
E	100 x 50 x 2mm "Z" purlins	LM	550		
F	12mm diameter sag rods threaded for and including nuts and washers and drilling holesthrough "Z" purlins	LM	750		
	Plates, Cleats, etc.				
G	6mm thick plate size 200 x 200 mm six times drilled for 8 mm diameter bolt	NO	44		
	Bolts and nuts to B. S. 4190				
H	9 mm diameter bolt 80 mm long with head, nut and two washers	NO	900		
J	16 mm ditto, 225 long with ditto	NO			
	ROOF FINISHES AND COVERING				
K	Supply and fix gauge 28.0 pre-painted normal corrugated (11/3) Roof covering sheets at 25.0 degrees from horizontal from MRM or any other equal and approved by P.M fixed to timber purlins m/s and including all necessary accessories.	SM	433		
	RAIN WATER DISPOSAL				
L	Supply and fix APP membrane to RC gutters all in accordance with architect drawings and approvals.	SM	86		
M	Down Pipes with solvent welded joints, fixed to walls with holderbolts size 100 x 100 mm or any other approved	LM	15		
N	Extraover for swan kneck in pipe , size' - 100 x 100 mm	No.	3		
P	Extraover for shoe in pipe , size' - 100 x 100 mm	No.	3		
	Wrot timber selected and kept clean				
Q	225x25mm Fascia or barge board	LM	180		
	Carried Forward to summary of Section				

Item	Description	Unit	Qty	Rate *Kshs*	Amount *Kshs*
	BILL NO.5 WINDOWS				
	Supply and fix the following purpose made standard 25mm 'Z'-section , 25mm T-sections, steel casement window fabricated to approved detailed designs: hooded mosquito proofed permanent vents: pin type hinges: : including all necessary cutting, welding, grinding, ironmongery one coat red oxide primer before fixing: window size				
A	window size 1800x1400mm high	NO	7		
B	Ditto but 2200 x1400mm high ditto	NO	2		
C	Ditto but 2100 x1400mm high ditto	NO	4		
D	Ditto but 2900 x1400mm high ditto	NO	2		
E	Ditto but 3000 x900mm high ditto	NO	2		
F	Ditto 1200x1200mm high ditto	NO			
	Steel casement windowssecti including mullions,5mm thick obscured glass window stays,fasteners all to architect's schedule and approval				
G	800x600mm high ditto	NO	5		
	pelmet boxes in wrot mahogany timber or any other approve timber by the project manager.				
H	50x25mm bearer plugged	LM	38		
J	150x25mm top with one labour	LM	38		
K	150x25mm fascia with two labours	LM	38		
L	Boxed end to 150x150mm pelmet	NO	18		
M	twyfords curtain rail complete with rollers	LM	38		
	window cill				
N	75mm precast concrete cill in class 20 concrete	LM	43		
	PAINTING AND DECORATION				
P	Prepare and apply three coats of gloss oil paints to metal surface of window externally	SM	49		
Q	ditto internally	SM	49		
	Carried Forward to summary of Section				

Item	Description	Unit	Qty	Rate	Amount Kshs
	BILL NO.6				
	DOORS & IRON MONGERY-(Supply and fix items)				
	Timber doors				
	50mm thick hardwood panel doors comprising of standard panels with 300mm wide van light to Architects door schedule and approval.				
A	Door double leaf size 1500x2400mm high	No			
B	Door leaf size 900x2400mm high to main entrance	No	5		
	45 mm Solid core flush doors faced both sides with 6 mm plywood ordinary for polishing , moulded and lipped all round, size ;				
C	900x2400mm	No.	2		
D	900x2100mm	No.	5		
	Doors, frames and finishings in wrot hardwood timber frames to P.M approval				
E	150 x 50 mm thick door frame with 3 labours	LM	74		
F	40 x 25 mm hardwood architrave with one labour	LM	74		
G	25 mm quadrant	LM	74		
H	38 mm rubber door stop fixed with rawl bolts	NO	5		
J	150 x3mm thick stainless steel butt hinges	Pairs	9		
K	Ditto but double swing hinges	Pairs			
	Supply and fix the following 'brass' ironmongery as 'Union' catalogue or equal and approved: from Assa Abloy (EA) Ltd: allow for matching handles, screws and fixing accessories				
L	Two lever mortice lock complete with fittings Union 2237	NO	7		
M	Indicator bolt to washrooms	NO	5		
N	125 x 25 x3mm thick wrought door fixing cramps	NO	68		
	ROLLER SHUTTER DOORS & IRON MONGERY-(Supply and fix items)				
P	Supply and fix 2.8m high x 3.00m wide roller shutter doos complete with manual rollers springs fixed with closing chain and painted with one undercoat paints before fixing and two coats of gloss paint to project managers approval.m.s	NO	2		
	Prepare and apply Three coats of gloss paints or any other approved paints to :-				
Q	General surfaces of steel Doors internally	SM	17		
R	Ditto externally	SM	17		
	Total carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
A	Back of wood before fixing; not exceeding 100 mm girth but not exceeding 200mm girth	LM	74		
	Prepare and apply Three coats clear varnish paint or any other approved paints to :-				
B	General surfaces of timber Doors internally	SM	23		
C	Ditto externally	SM	23		
	Steel door				
	Supply assemble & fix the following purpose made in heavy duty 20 x 20mm 'Z' & 'T' -sections, 4mm thick; metric W20 range; fabricated to approved detailed designs; 60 x 40 x 3mm framing complete with beading: cottage style, small panelled; 200 x 300mm equal panes; glazed in 6mm bronze tinted glass: hooded mosquito proofed permanent vents,pin type hinges; 12mm Square mild steel bars, welded in approved pattern; to match profile of door frames including all necessary cutting, welding, grinding, ironmongery from 'Kensmetal Ltd'; and one coat red oxide primer before fixing.				
E	1200 x 2400mm High to kitchen yard and roof slab	No.	3		
	Prepare and apply Three coats of gloss paints or any other approved paints to :-				
F	General surfaces of steel Doors internally	SM	11		
G	Ditto externally	SM	11		
	ROLLER SHUTTER DOORS & IRON MONGERY-(Supply and fix items)				
M	Supply and fix 2.8m high x 3.00m wide roller shutter doos complete with manual rollers springs fixed with closing chain and painted with one undercoat paints before fixing and two coats of gloss paint to project managers approval.m.s	NO	2		
	Prepare and apply Three coats of gloss paints or any other approved paints to :-				
F	General surfaces of steel Doors internally	SM	17		
G	Ditto externally	SM	17		
	Total carried to collection				
	COLLECTION				
1	**Brought forward from page NO.11**				
2	**Brought forward from above**				
	Total carried to summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.7 FINISHES				
	EXTERNAL WALL FINISHES				
	Key pointing				
A	Horizontal recess and verical flush pointing to walls externally	SM	174		
B	Wood trowelled plasters to surfaces of beams and cable ends to receive weatherguard paints.	SM	74		
	Prepare and apply two coats of weatherguard paint or other equal and approved by Architect to:				
C	To plastered surfaces of walls externaly.	SM	74		
	INTERNAL WALL FINISHES **12mm (minimum) cement sand (1:3) screed to receive ceramic tiles**				
D	15mm thick minimum Wood float plaster to walls to receive wall tiles m.s.	SM	79		
E	Steel trowelled smooth plasters to surfaces of wall to receive paint (m/s)	SM	393		
F	Steel trowelled smooth plasters to surfaces of,beams and columns	SM	147		
G	Steel trowelled smooth plasters to soffits surfaces of suspended slab	SM	77		
	PAINTING AND DECORATING **Prepare and apply three coats silk vinyl emulsion paint or other approved by Architect**				
H	To plastered surfaces of walls	SM	393		
J	To plastered surfaces of,beams and columns	SM	147		
K	To plastered surfaces soffits of suspended slab	SM	77		
	CERAMIC WALL TILES **330X330X6mm thick coloured ceramic wall tiles in approved pattern.**				
L	To Walls in bathrooms and washrooms.	SM	79		
	INTERNAL FLOOR FINISHES				
	Terrazo Floor finish				
M	Supply, deliver and fix 25mm thick Terrazo floor finish using white cement, including all the necessary cement sand screads, dividing stips grounded smooth and with approved colour to project manager's approval.	SM	304		
N	Ditto100mm high white ceramic tile skirting	LM	379		
	Total carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	CEILING FINISHES				
A	12mm thick chipboard horizontal ceiling fixed to and including 50x50mm sawn cypress brandering at 600mm c/c both directions ,finishing joint with fibre tape and skimming before applying finishing coats of paint	SM	304		
B	Extra`over ceiling for trap door size 600x600mm	NO	4		
	Sawn cypress: pressure impregnated				
C	50 x 50mm Brandering to ceilings at 600mm centres both ways: plugged to walls where necessary	LM	1,136		
	CORNICE				
D	150X25mm cornice	LM	379		
	PAINTING AND DECORATING				
	Prepare and apply three coats matt emulsion paint or other and approved				
E	To surfaces of chipboard suspended ceiling	SM	304		
D	Ditto to 150X25mm cornice surface.	LM	379		
	Total carried to collection				
	COLLECTION				
1	**Total Brought Forward From Page No.13**				
2	**Total Brought Forward From above**				
	Carried Forward to Summary				

Item	Description	Unit	Quantity	Rate	Amount
	BILL NO 8.: PLUMBING & DRAINAGE INSTALLATIONS				
	All works to be carried out by the registered plumbing sub-contractor approved by the project manager.				
	Supply and fix the following sanitary ware and fittings complete with all necessary piping as selected and approved by the architect / client.				
	Vanity tops				
A	600mm wide vanity tops comprising 75mm thick concrete slab with and including BRC mesh wire A66 ,formwork .plaster and paint to soffits of worktop,making opening for plastic sinks where necessary, intermediate support wall, all in accordance with architect's drawings and specification	LM	19		
	Ceramic tile finish to vanity tops				
B	Supply and fix 300x200x6mm thick ceramic tile finish to 600mm wide vanity tops and 100mm skirting and 150mm fascia fixed with approved adhesive	SM	29		
	SINK				
C	"ASL" double bowl single drain stainless steel sink (800 x 500mm) with 15mm bib tap, chain and waste 32mm, C.P. 32mm bottle trap with 75mm seal with 200mm long tail piece, capnuts and wall flange, brackets including fixing	No	6		
	WATER CLOSET				
D	Twyford' or equivalent water closet comprising WC pan,low level 9litres cistern side inlet internal overflow with valveless fittings:innlet connection;flush pipe and chrome plated lever;white plastic seat and cover;including fixing pan to floor and cistern to wall wiith screws and plugs	NO	3		
E	Ditto but dissable toilets	NO			
	WASH HAND BASIN				
F	Twyford or equivalent wash hand basin as semi-recessed vitreouswhite china(450 x 300mm) with two taphole,taps,chain,and waste 32mm C.P 32mm bottle trap with 75mm seal with 200mm tail piece,capnuts and wall flange,brackets including fixing	NO	6		
G	White vitreous china recessed toilet roll holder	NO	3		
H	ditto soap dish	NO	3		
J	Mirror size 600 x450mm high bevelled edges on plywood backing fixed with C.P screws with dome covers;plugged to wall	NO	6		
K	25mm diameter crome plated towel rail 600mm long	NO			
H	Allow **provisional sum of kshs……..shillings** for eleveted storage water tank 5000 ltrs as 'KENTANK' including 3No. Perforation (25mm,12mm,20mm diameter) RHS members with Ms plate base of the tank to later details and approval.	NO	2		
J	12mm diameter ball valve	NO	4		
	Pipe works & drainage works				
D	Allow the Provisinal sum of Kenya shillings …….(Ksh.00000-) only for pipeworks, taps all fittings and fixtures drainage works including excavation of a soak pit as directed on site	ITEM	1		
	Carried Forward to Summary of Section				

ITEM	DESCRIPTION	QTY	RATE	UNIT	AMOUNT
	ELECTRICAL INSTALATION WORKS				
	Supply, install test and commision the followings:				
1	Lighting point wired using 3X1.5 sq. mm single core PVC cable drawn in 20 mm PVC conduits	56	1,900	NO	
2	6A, 1 gang 1 way switch complete with mounting box (MK)	2	350	NO	
3	6A, 2 gang 2 way switch complete with mounting box (MK)	19	430	NO	
4	6A, 4 gang 1 way switch complete with mounting box (MK)	1	460	NO	
5	36 watts fluorescent light fittings	48	2,200	N0	
6	Ball fittings complete with 18 watts energy saving lamp	4	950	NO	
7	Bulkhead light fittings complete with 18 watts energy saving lamp	4	1,100	NO	
8	Powerpoint wired using 3X2.5 sq. mm single core PVC cable drawn in 20 mm PVC conduits	32	3,200	NO	
9	13 A, double switched socket outlet complete with mounting box (MK)	32	500	NO	
10	Two core 6.0 sq. mm PVC cable drawn in 20 mm PVC conduits so as to link consumer units	85	360	M	
11	10 A MCB	11	1,000	NO	
12	16 A MCB	8	1,000	NO	
13	10 A MCB	4	1,000	NO	
14	6 way consumer unit (CCU)	4	4,800	NO	
15	6-way distribution board	1	20,000	NO	
16	Earthing comprising the following:				
i	Pure copper earth electrode	4	1,100	NO	
ii	6.0 mm sq. PVC earth cable	60	1,000	M	
17	80 A KMPG (original)	1	1,000	NO	
18	63 A MCB	4	1,500	NO	
	Total carried forward to collection				

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
1	**Fire Fighting Equipment and fire Alarm system**				
A	Provide a P.C sum of **Kshs. …….. Only** for Fire fighting equipment		1	100,000.0	
B	Add for profit			0.1	
C	Allow for attendance and builder's work (Subject to proportional adjustment)	SUM	1	40,000.0	
D	Provide a P.C sum of **Kshs.40,000. Only** for power connection to the proposed building		1	40,000.0	
	Total carried forward to summary page				
	COLLECTION PAGE				
1	**Brought forward from Page 1**			**Ksh.**	
2	**Brought forward from above**			**Ksh.**	
	TOTAL SUM FOR I FLOOR			**Ksh.**	
	Total for 5no floors				
	TOTAL SUM FOR ELECTRICAL WORKS				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO 9.				
	PC AND PROVISIONAL SUMS				
	ELECTRICAL INSTALATIONS WORKS				
A	Allow a Provisional sums of **kshs 400,000.only** for Electrical instalation works, to later details and approval.	Item	1	400,000	
	KITCHEN EQUIPMENTS				
D	Allow a Provisional Sums of **Kenya Shillings Two Million** only for supply and instalation of Kitchen equipments, Kitchen duct, Gas Cookers, Fridges, Cooking Oven, Electric cooking range as instructed on site.	Item	1	2,000,000	
	Fire Fighting Equipment and fire Alarm system				
E	Provide a Provisional sums of **Kshs.100,000. Only** for Fire fighting equipment		1	100,000.0	
	Total carried to main section summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	SECTION SUMMARY				
1	**Substructures works**				
2	**Reinforced concrete works**				
3	**External and internal walling**				
4	**Roof construction and covering**				
5	**Windows**				
6	**Doors and ironmongery**				
7	**External, internal wall and ceilling finishes**				
8	**Plumbing works, fittings and fixtures**				
9	**Provisional sums**				
	Summary for Kitchen & Laundry Carried to Section Collection Summary				

REPUBLIC OF KENYA

BOMET COUNTY.

Department of Roads,Transport & Public works

PROPOSED REFUSE STORE & OFFICE

AT MOTHER & CHILD WELLNESS CENTRE

Bill of quantities

ARCHITECT
PUBLIC WORKS
ARCHITECTS
BOMET COUNTY
P.O.BOX 496-20400,
BOMET.

STRUCTURAL ENGINEERS
PUBLIC WORKS
ENGINEERS
BOMET COUNTY
P.O.BOX 19-20400,
BOMET.

QUANTITY SURVEYORS
PUBLIC WORKS
SURVEYORS
BOMET COUNTY
P.O.BOX 19-20400,
BOMET.

08/Sep/21

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	PROPOSED REFUSE STORE				
	BILL NO.1				
	SUBSTRUCTURES / PROVISIONAL				
	SITE CLEARANCE				
A	Clear site of bushes,shrubs and the like, grup up there root and burn the arisings	SM	81		
B	Excavate vegetable top soil average 150mm deep set aside in spoil heaps and later spread around the site as directed.	SM	81		
C	Excavate oversite commencing from stripped level but not exceeding 1.5m deep.	SM	73		
D	Excavate foundation trench not exceeding 1.50m deep commencing from stripped level and backfill	CM	44		
E	Ditto pits for column bases stock pile around site ,part backfill around trenches and spread around the site has directed.	CM	19		
	Rock excavation				
F	Extra over excavations in rocks irespective of type.	CM	15		
G	Allow for keeping excavations free from all water by pumping or otherwise	ITEM	1		
H	Allow for plunking and strutting sides of excavation trenches	ITEM	1		
	Disposal				
J	Load,wheel and cart away surplus soil.	CM	37		
	Hardcore filling				
K	Supply and fix 300mm thick Imported, Hand packed hardcore; watered and well compacted in 150mm thickness	SM	73.0		
L	50mm thick murram blinding to surfaces of hardcore	SM	73		
	Anti-termite treatment				
M	Termidor' or any other equal and approved chemical treatment to surfaces of blinded hardcore and around foundations; apply in accordance with manufacturers specification; provide a ten(10) written quarantee against termites	SM	73		
	Mesh fabric reinforcement to B.S 4483 and setting in concrete with 300mm side and end laps (measured nett-allow for laps)				
N	Fabric mesh ref:A142 weighing 2.22kg per square metre in floor bed	SM	73		
	Carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	DAMP PROOF MEMBRANE				
A	1000 gauge polythene damp proof memmbrane laid under surface bed with 300mm side and end laps (measured net -allow for laps)	SM	73		
	CONCRETE				
B	50mm thick concrete (1:4:8 mix) blinding under footings	SM	29		
C	Ditto but to column bases	SM	13		
	Insitu concrete class 20/20, vibrated and reinforced as described, in:-				
D	Column bases & Foundation Columns	CM	5		
E	400mm high groundbeams	CM	4		
F	strip footing	CM	6		
G	125mm thick surface bed	SM	73		
	Reinforcement bars ; high tensile steel to BS 4461 all in accordance with the Engineer's details and approval including all cutting,bending,laying and binding wire to;				
H	Column bases & Foundation Columns	Kg	600		
J	Groundbeams	Kg	480		
K	strip footing	Kg	240		
	FORMWORK				
N	Ditto but to vertical sides of sturbed columns and column bases;	SM	20		
P	Ditto but to vertical sides of strip footing of 175-225mm high.	LM	97		
Q	Edges of ground floor slab over 75mm but not exceeding 150mm high	LM	34		
	Foundation walls				
R	Supply and fix 200mm thick natural stone wall foundations bedded and jointed in c.s morta 1;4 with hoop iron bars at alternate course.	SM	58		
	DPC Three -ply bituminous felt damp proof course bedded in cement and sand morta(1;3)				
S	200mm Wide horizontal layer	LM	42		
	PLINTH FINISH **Cement and Sand 1:4 render**				
T	12 mm thick render wood float	SM	19		
	Prepare and apply two coats bituminous paint to:				
U	Render surfaces externally	SM	19		
	Carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	COLLECTION				
1	**Total Brought Forward From Page No.1**				
2	**Total Brought Forward From Page No.2**				
	TOTAL CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate *Kshs*	Amount *Kshs*
	BILL NO.2				
	REINFORCED CONCRETE WORKS SUPERSTRUCTURE				
	Vibrated reinforced concrete (1;2;4) class 20 in;				
A	Columns	CM	2		
B	Beams	CM	3		
C	100mm thick RC. Gutters	SM	28		
D	150mm thick suspended slab to 3rd floor to carry water Tank.	SM	-		
	REINFORCEMENT				
	Reinforcement in different sizes in structural concrete work all in accordance with the Engineer's details and approval including all cutting,bending,laying and binding wire to;				
E	columns	Kg	200		
F	Beams	Kg	300		
G	Rc gutters	Kg	378		
	SAWN FORMWORK TO;				
H	Sides of vertical columns	SM	310		
J	Sides and of beams	SM	229		
K	Soffits of slabs	SM	28		
L	Edges of suspended slabs over 75mm but not exceeding 150mm high	LM			
	Total Carried to summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.3				
	WALLINGS				
	EXTERNAL WALLING				
	Load bearing chisel cut natural stone walling (7N/mm, jointed in cement and sand(1;3)morter and including hoop iron reinforcement at alternate courses including all necessary working around all door and windows openings formed accurately as per Architects schedule				
A	200mm thick walling	SM	162		
B	Ditto but to cable wall	SM	-		
	INTERNAL WALLING				
	Load bearing chisel cut natural stone walling (7N/mm, jointed in cement and sand(1;3)morter and including hoop iron reinforcement at alternate courses including all necessary working around all door and windows openings formed accurately as per Architects schedule				
C	150mm thick	SM	42		
D	100mm thick	SM	-		
	Louvered Bricks				
E	Supply and fix clay louvered bricks (Kenya clay products) to an approved parten by the project manager jointed with c/s mo. 1;3 and painted to approval to staircase wall.	SM	14		
	Total Carried to summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.4				
	ROOF CONSTRUCTION AND COVERING				
	BILL NO.4				
	MAIN ROOF -STEEL TRUSSES TO THE MAIN HALL				
	Framed structural steel work, factory primed before delivery to site and to be executed by an approved specialist all including hoisting, welding and ground smooth all to project manager's approval.				
	Steel trusses				
A	50X50X3mm wall plate secured with and including 12mm diameter mild steel 'J'bolt	LM	40.0		
B	50 x 50 x3mm rectangular hollow section main rafter member/ principle rafters. Top & bottom chords.	LM	155.0		
C	40 x 40 x 3mm rectangular hollow sections to kingposts.	LM	46.0		
D	40 x 40 x 3mm square hollow section struts/ties	LM	76.0		
E	100 x 50 x 2mm "Z" purlins	LM	256		
F	12mm diameter sag rods threaded for and including nuts and washers and drilling holesthrough "Z" purlins	LM	350.0		
	Plates, Cleats, etc.				
G	6mm thick plate size 200 x 200 mm six times drilled for 8 mm diameter bolt	NO	22.0		
	Bolts and nuts to B. S. 4190				
H	9 mm diameter bolt 80 mm long with head, nut and two washers	NO	200.0		
	ROOF FINISHES AND COVERING				
J	Supply and fix gauge 30.0 pre-painted normal corrugated (11/3) Roof covering sheets at 25.0 degrees from horizontal from MRM or any other equal and approved by P.M fixed to timber purlins m/s and including all necessary accessories.	SM	94		
	RAIN WATER DISPOSAL				
K	Supply and fix APP membrane to RC gutters all in accordance with architect drawings and approvals.	LM	42		
L	Down Pipes with solvent welded joints, fixed to walls with holderbolts size 100 x 100 mm or any other approved	LM	15		
M	Extraover for swan kneck in pipe , size' - 100 x 100 mm	No.	2		
N	Extraover for shoe in pipe , size' - 100 x 100 mm	No.	2		
	Carried Forward to summary of Section				

Item	Description	Unit	Qty	Rate *Kshs*	Amount *Kshs*
	BILL NO.5 WINDOWS				
	Supply and fix the following purpose made standard 25mm 'Z'-section , 25mm T-sections, steel casement window fabricated to approved detailed designs: hooded mosquito proofed permanent vents: pin type hinges: : including all necessary cutting, welding, grinding, ironmongery one coat red oxide primer before fixing: window size				
A	window size 2200x1400mm high	NO	3		
	Steel casement windowssecti including mullions,5mm thick obscured glass window stays,fasteners all to architect's schedule and approval				
B	800x600mm high ditto	NO	1		
	pelmet boxes in wrot mahogany timber or any other approve timber by the project manager.				
C	50x25mm bearer plugged	LM	6		
D	150x25mm top with one labour	LM	6		
E	150x25mm fascia with two labours	LM	6		
F	Boxed end to 150x150mm pelmet	NO	6		
G	twyfords curtain rail complete with rollers	LM	6		
	window cill				
H	75mm precast concrete cill in class 20 concrete	LM	7		
	PAINTING AND DECORATION				
I	Prepare and apply three coats of gloss oil paints to metal surface of window externally	SM	6		
J	ditto internally	SM	6		
	Carried Forward to summary of Section				

Item	Description	Unit	Qty	Rate	Amount Kshs
	BILL NO.6				
	DOORS & IRON MONGERY-(Supply and fix items)				
	Timber doors				
	50mm thick hardwood panel doors comprising of standard panels with 300mm wide van light to Architects door schedule and approval.				
A	Door double leaf size 1500x2400mm high	No			
B	Door leaf size 900x2400mm high to main entrance	No	1.0		
	45 mm Solid core flush doors faced both sides with 6 mm plywood ordinary for polishing , moulded and lipped all round, size ;				
C	900x2400mm	No.			
D	900x2100mm	No.	1		
	Doors, frames and finishings in wrot hardwood timber frames to P.M approval				
E	150 x 50 mm thick door frame with 3 labours	LM	12		
F	40 x 25 mm hardwood architrave with one labour	LM	12		
G	25 mm quadrant	LM	12		
H	38 mm rubber door stop fixed with rawl bolts	NO	1		
J	150 x3mm thick stainless steel butt hinges	Pairs	3		
K	Ditto but double swing hinges	Pairs			
	Supply and fix the following 'brass' ironmongery as 'Union' catalogue or equal and approved: from Assa Abloy (EA) Ltd: allow for matching handles, screws and fixing accessories				
L	Two lever mortice lock complete with fittings Union 2237	NO	1		
M	Indicator bolt to washrooms	NO	1		
N	125 x 25 x3mm thick wrought door fixing cramps	NO			
	ROLLER SHUTTER DOORS & IRON MONGERY-(Supply and fix items)				
P	Supply and fix 2.8m high x 3.00m wide roller shutter doos complete with manual rollers springs fixed with closing chain and painted with one undercoat paints before fixing and two coats of gloss paint to project managers approval.m.s	NO	1.00		
	Prepare and apply Three coats of gloss paints or any other approved paints to :-				
Q	General surfaces of steel Doors internally	SM	9.00		
R	Ditto externally	SM	9.00		
	Total carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
A	Back of wood before fixing; not exceeding 100 mm girth but not exceeding 200mm girth	LM	12.0		
	Prepare and apply Three coats clear varnish paint or any other approved paints to :-				
B	General surfaces of timber Doors internally	SM	4.0		
C	Ditto externally	SM	4.0		
	Steel door				
	Supply assemble & fix the following purpose made in heavy duty 20 x 20mm 'Z' & 'T' -sections, 4mm thick; metric W20 range; fabricated to approved detailed designs; 60 x 40 x 3mm framing complete with beading: cottage style, small panelled; 200 x 300mm equal panes; glazed in 6mm bronze tinted glass: hooded mosquito proofed permanent vents,pin type hinges; 12mm Square mild steel bars, welded in approved pattern; to match profile of door frames including all necessary cutting, welding, grinding, ironmongery from 'Kensmetal Ltd'; and one coat red oxide primer before fixing.				
E	1200 x 2400mm High to kitchen yard and roof slab	No.	1		
	Prepare and apply Three coats of gloss paints or any other approved paints to :-				
F	General surfaces of steel Doors internally	SM	3.0		
G	Ditto externally	SM	3.0		
	Total carried to collection				
	COLLECTION				
1	**Brought forward from page NO.11**				
2	**Brought forward from above**				
	Total carried to summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.7 FINISHES				
	EXTERNAL WALL FINISHES				
	Key pointing				
A	Horizontal recess and verical flush pointing to walls externally	SM	162		
B	Wood trowelled plasters to surfaces of beams and cable ends to receive weatherguard paints.	SM	-		
	Prepare and apply two coats of weatherguard paint or other equal and approved by Architect to:				
C	To plastered surfaces of walls externaly.	SM	-		
	INTERNAL WALL FINISHES				
	12mm (minimum) cement sand (1:3) screed to receive ceramic tiles				
D	15mm thick minimum Wood float plaster to walls to receive wall tiles m.s.	SM	27		
E	Steel trowelled smooth plasters to surfaces of wall to receive paint (m/s)	SM	219		
F	Steel trowelled smooth plasters to surfaces of,beams and columns	SM	384		
G	Steel trowelled smooth plasters to soffits surfaces of suspended slab	SM	28		
	PAINTING AND DECORATING				
	Prepare and apply three coats silk vinyl emulsion paint or other approved by Architect				
H	To plastered surfaces of walls	SM	219		
J	To plastered surfaces of,beams and columns	SM	384		
K	To plastered surfaces soffits of suspended slab	SM	28		
	CERAMIC WALL TILES				
	330X330X6mm thick coloured ceramic wall tiles in approved pattern.				
L	To Walls in bathrooms and washrooms.	SM	27		
	INTERNAL FLOOR FINISHES				
	cement and sand (1:4) backing				
M	32mm thick cement and sand screed to recieve ceramic floor tiles m.s	SM	73		
	Terrazo Floor finish				
N	Supply, deliver and fix 25mm thick Terrazo floor finish using white cement, including dividing stips grounded smooth and with approved colour to project manager's approval.	SM	73		
P	150mm high skirting	LM	56		
	Total carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	CEILING FINISHES				
A	9mm thick chipboard horizontal ceiling fixed to and including 50x50mm sawn cypress brandering at 600mm c/c both directions ,finishing joint with fibre tape and skimming before applying finishing coats of paint	SM	21		
B	Extra`over ceiling for trap door size 600x600mm	NO	4		
	Sawn cypress: pressure impregnated				
C	50 x 50mm Brandering to ceilings at 600mm centres both ways: plugged to walls where necessary	LM	90		
	CORNICE				
D	150X25mm cornice	LM	56		
	PAINTING AND DECORATING				
	Prepare and apply three coats matt emulsion paint or other and approved				
E	To surfaces of chipboard suspended ceiling	SM	21		
D	Ditto to 150X25mm cornice surface.	LM	56		
	Total carried to collection				
	COLLECTION				
1	**Total Brought Forward From Page No.13**				
2	**Total Brought Forward From above**				
	Carried Forward to Summary				

Item	Description	Unit	Quantity	Rate	Amount
	BILL NO 9.: PLUMBING & DRAINAGE INSTALLATIONS				
	<u>All works to be carried out by the registered plumbing sub-contractor approved by the project manager.</u>				
	WATER CLOSET				
A	Twyford' or equivalent water closet comprising WC pan,low level 9litres cistern side inlet internal overflow with valveless fittings:innlet connection;flush pipe and chrome plated lever;white plastic seat and cover;including fixing pan to floor and cistern to wall wiith screws and plugs	NO	1		
	WASH HAND BASIN				
B	Twyford or equivalent wash hand basin as semi-recessed vitreouswhite china(450 x 300mm) with two taphole,taps,chain,and waste 32mm C.P 32mm bottle trap with 75mm seal with 200mm tail piece,capnuts and wall flange,brackets including fixing	NO	1		
C	White vitreous china recessed toilet roll holder	NO	1		
D	ditto soap dish	NO	1		
E	Mirror size 600 x450mm high bevelled edges on plywood backing fixed with C.P screws with dome covers;plugged to wall	NO	1		
F	25mm diameter crome plated towel rail 600mm long	NO			
	Pipe works & drainage works				
G	Allow the Provisinal sum of **Kenya shillings 50,000** only for pipeworks, taps all fittings and fixtures drainage works including excavation of a soak pit as directed on site	ITEM	1.0	50,000	
	Carried Forward to Summary of Section				

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	ELECTRICAL INSTALATION WORKS				
	Supply, install test and commision the followings:				
1	Lighting point wired using 3X1.5 sq. mm single core PVC cable drawn in 20 mm PVC conduits	56	NO		
2	6A, 1 gang 1 way switch complete with mounting box (MK)	2	NO		
3	6A, 2 gang 2 way switch complete with mounting box (MK)	19	NO		
4	6A, 4 gang 1 way switch complete with mounting box (MK)	1	NO		
5	36 watts fluorescent light fittings	48	N0		
6	Ball fittings complete with 18 watts energy saving lamp	4	NO		
7	Bulkhead light fittings complete with 18 watts energy saving lamp	4	NO		
8	Powerpoint wired using 3X2.5 sq. mm single core PVC cable drawn in 20 mm PVC conduits	32	NO		
9	13 A, double switched socket outlet complete with mounting box (MK)	32	NO		
10	Two core 6.0 sq. mm PVC cable drawn in 20 mm PVC conduits so as to link consumer units	85	M		
11	10 A MCB	11	NO		
12	16 A MCB	8	NO		
13	10 A MCB	4	NO		
14	6 way consumer unit (CCU)	4	NO		
15	6-way distribution board	1	NO		
16	Earthing comprising the following:				
i	Pure copper earth electrode	4	NO		
ii	6.0 mm sq. PVC earth cable	60	M		
17	80 A KMPG (original)	1	NO		
18	63 A MCB	4	NO		
	Total carried forward to collection				

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
1	**Fire Fighting Equipment and fire Alarm system**				
A	Provide a P.C sum of **Kshs. 100,000 Only** for Fire fighting equipment		1	100,000	
B	Add for profit				
C	Allow for attendance and builder's work (Subject to proportional adjustment)	SUM	1		
D	Provide a P.C sum of **Kshs. 40,000. Only** for power connection to the proposed building		1	40,000	
	Total carried forward to summary page				
	COLLECTION PAGE				
1	**Brought forward from Page 1**			**Ksh.**	
2	**Brought forward from above**			**Ksh.**	
	TOTAL SUM FOR I FLOOR			**Ksh.**	
	Total for 5no floors				
	TOTAL SUM FOR ELECTRICAL WORKS				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO 11.				
	PC AND PROVISIONAL SUMS				
	ELECTRICAL INSTALATIONS WORKS				
A	Allow a Provisional sums of **kshs 150,000 only** for Electrical instalation works, to later details and approval.	Item	1	150,000	
B	Allow for profits				
C	Allow for attendance (Subject to proportional adjustment)				
	CONTINGENCIES SUMS				
G	Allow a contigency sum of **kshs …….. shillings to be expended at the project manager's discretion**	item	1		
	Total carried to main summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	SECTION SUMMARY				
1	**Substructures works**				
2	**Reinforced concrete works**				
3	**External and internal walling**				
4	**Roof construction and covering**				
5	**Windows**				
6	**Doors and ironmongery**				
7	**External, internal wall and ceilling finishes**				
9	**Plumbing works, fittings and fixtures**				
12	**Allow a PC & Provisional sums for Electrical works, Fire alarm**				
	Total for Refuse store Carried To Section Collection Summary Page.				

Item	Description	Unit	Qty	Rate	Kshs
	MECHANICAL WORKS				
	PRIME COST AND PROVISIONAL SUMS				
	The following sums may be expanded in whole or in part at the sole discretion of the project manager and on his written authority only.				
	MECHANICAL INSTALLATION WORKS				
	Clean Water supply to the facility	.			
A	Allow a Provisional Sums of Kenya Shillings **Four million (3,000,000.00)** Only for Bore drilling and any other associated works.	**Pc**	**1**	3,000,000	3,000,000.00
	Clean Water treatment	.			
B	Allow a Provisional Sums of Kenya Shillings **One million Five hundred thousand (1,500,000.00)** Only for Reverse Osmosis (RO) water treatment plant	**Pc**	**1**	1,500,000	1,500,000.00
	Wastes Water treatment Plant				
C	Provide the Provisional Cost Sum of Kenya Shillings **One million five hunded thousand (1,500,000.00)** Only for Provision of Biodigester-wastes water Treatment plant	**Pc**	**1**	1,500,000	1,500,000.00
	Rain Water Harvesting tank/Raw water storage tank				
D	Allow a provisisonal Sum of Kenya Shillings Two M**illion (2,000,000.00)** Only for200,000litres Underground concrete water tank (water outlets,pipework and accessories)	**Pc**	**1**	2,000,000	2,000,000.00
	Carried Forward to Summary				

Item	Description	Unit	Qty	Rate	Kshs
	Incinerator equipment				
A	Allow a Provisional Sums of Kenya Shillings Ten **million (10,000,000.00)** Only for providing standard Medical wastes incinerator with a wet scraber stainless steel chimney ,ash pit and fuel tank. The cost includes transport, crane hiring , electrical controls, plant, testing and commissioning as perEnginnerinstructions complete with Ash pit	**Pc**	**1**	10,000,000	10,000,000.00
	Laundry equipment				
B	Provide the Provisional Cost Sum of Kenya Shillings Two Million **(2,000,000.00)** Only provision for laundry equipments(Eletric washer,dryer.Ironer etc),Plumbing,Drainage services and other asociated Pipework.	**Pc**	**1**	2,000,000	2,000,000.00
	Kitchen Gas and piping instalation works				
C	Allow a Provisional Sums of Kenya Shillings Three Hundred Thausand (300,000) only for supply of Gas piping cylinders as instructed on site.	**Pc**	**1**	300,000	300,000.00
	Carried Forward to Collection				

Item	Description	Unit	Qty	Rate	Kshs
	Medical Gas Plant and system accessories				
A	Allow a Prime Cost Sum of Kenya Shillings Nine M**illion (9,000,000.00)** Only for Liguid oxygen plant , Medical air plant,250 m3/Hr Vacuum plant,Gas outlets,Copper pipework,Fittings and associated accessories.	**Pc**	**1**	9,000,000	9,000,000.00
B	Allow for general and special attendance	%			
C	Allow for profits and over heads	%			
	Operations theatre Air conditioning unit				
D	Allow a Provisisonal Sum of ksh…….. for Supply and Install of split air-conditioning system for Operations theare room(ducted complete with ducting,registers,grilles and extraction fan)	**Pc**	**1**	1,500,000	1,500,000.00
	Radiology Air conditioning units				
E	Allow a Provisional Sum of Kenya Shillings for Supply and Install of split air-conditioning system for X ray,CT scan and MRI Scan room.	**Pc**	**3**	150,000	450,000.00
	EXTERNAL & STREET LIGHTING				
F	Allow a Provisional Sums of Kenya Shillings One Million, Five Hundred Thousand **(1,500,000.00)** Only for Street Solar lighting and security lights	**Pc**	**1**	1,500,000	1,500,000.00
	STAND-BY GENERATOR				
G	Allow a Provisional sums for Generator set- 250kVA- Supply & install.	item	1.00	6,000,000	6,000,000.00
	Carried Forward to Collection				

Item	Description	Unit	Qty	Rate	Kshs
	COLLECTION				
1	**Brought forward From Page 1**				-
2	**Brought forward From Page 2**				-
3	**Brought forward From Page 3**				-
	TOTAL PC AND PROVISIONAL SUMS CARRIED TO SECTION COLLECTION SUMMARY PAGE				

SUMMARY- UTILITIES

	SECTION 3- SUMMARY PAGE -				**Amount**
					KSH
	UTILITY SERVICES/WORKS		***FROM PAGE***		
11	MEDICAL GASS PLANT HOUSE		*GAS PLANT- 14*		
12	GENERATOR HOUSE		*GEN. HSE- 13*		
13	INCINIRATOR & INCINIRATOR HOUSE		*INC. HSE-16*		
14	KITCHEN AND LAUNDRY		*KITCH & LAUND-16*		
16	REFUSE STORE		*REFUSE ST- 15*		
17	PROVISIONAL SUMS		*ANCILARY-4*		
	SUB-TOTALS FOR THE ANCILLARIES CARRIED TO THE MAIN SUMMARRY PAGE				

AMOUNT IN WORDS….....
….....

(SIGNATURE OF EMPLOYER)

NAME OF THE CONTRACTOR; ….....

ADDRESS: _____ ADDRESS: _____

NAME OF AUTHORIZED PERSON….....

DATE : _____ DATE : _____

Page SECT- SUM-3

GRAND SUMMARY

	MAIN SUMMARY PAGE -				**Amount**
					KSH
			FROM PAGE		
1	SECTION 1- PRELIMINARIES		*Page SECT- SUM-1-A*		
2	SECTION 1- MAIN BUILDING		*Page SECT- SUM-1-1*		
3	SECTION 2- ANCILLARY WORKS		*Page SECT- SUM-2*		
4	SECTION 3- UTILITY SERVICES		*Page SECT- SUM-3*		
	SUB-TOTALS				
5	**ADD 16% VAT**				
	GRAND TOTALS CARRIED TO FORM OF TENDER				

AMOUNT IN WORDS…..
…..

(SIGNATURE OF EMPLOYER)

NAME OF THE CONTRACTOR; …..

ADDRESS: _____ ADDRESS: _____

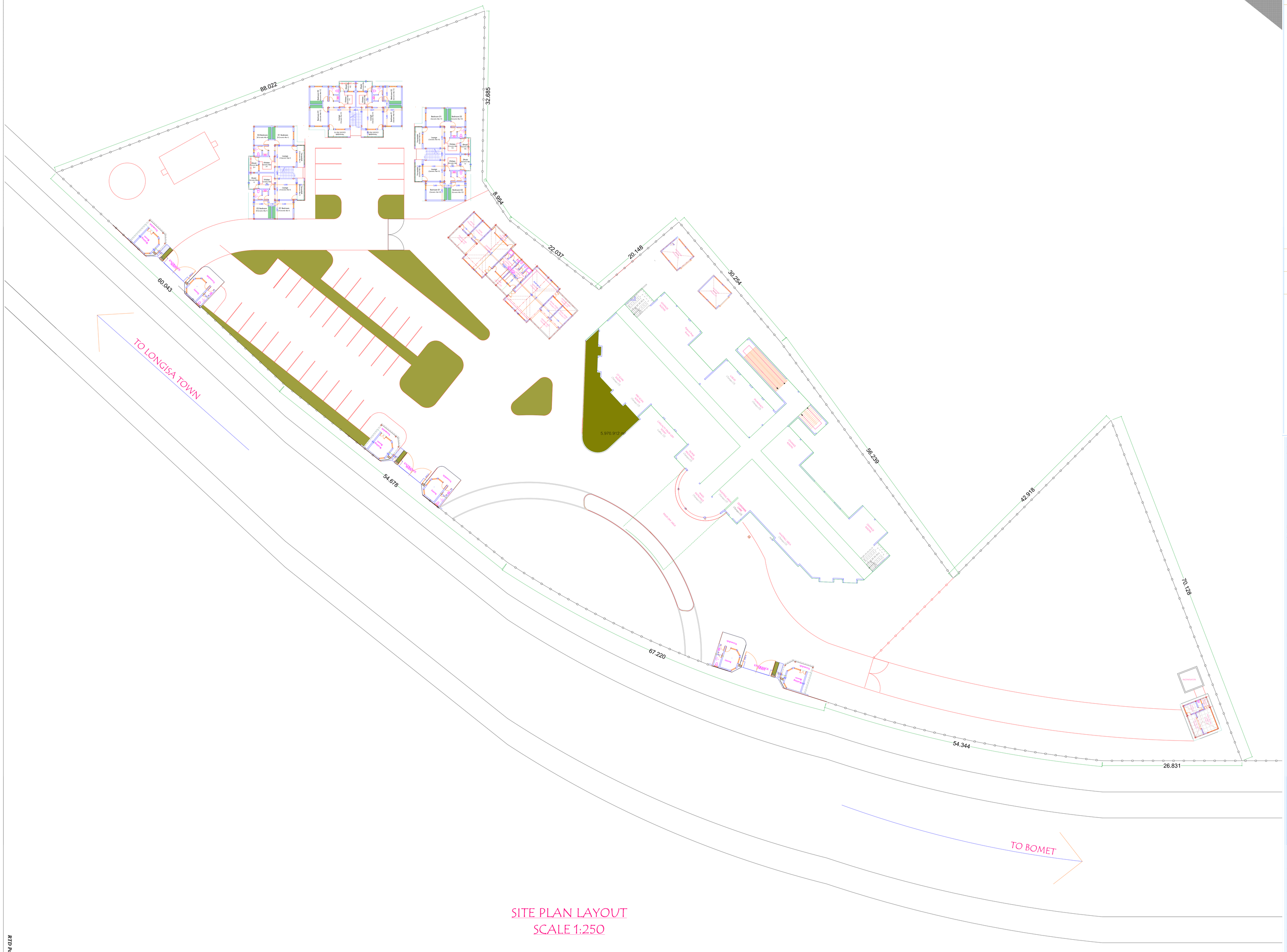
NAME OF AUTHORIZED PERSON…..

DATE : _____ DATE : _____

MS-1

SECTION 4

DRAWINGS



SITE PLAN LAYOUT
SCALE 1:250

NOTES

01 This drawing shall be read in conjunction with the Architect's/Engineer's drawings, any discrepancies MUST be reported to the Landscape Architect

02 Figured dimensions only to be taken from this drawing and all dimensions are in millimeters unless otherwise indicated

03 All r.c. works to structural engineer's detail

04 All Plant Graphics do not represented the actual size or colour of the plant

REVISIONS

no.	date	description

CLIENT:

DEPARTMENT OF PUBLIC HEALTH AND MEDICAL SERVICES COUNTY GOVERNMENT OF BOMET

Client's signature ..... Date .....

DRAWN BY:

DEPARTMENT OF PUBLIC WORKS COUNTY GOVERNMENT OF BOMET

Architect's signature ..... Date .....

PROJECT:

ROPOSED MOTHER AND CHILD WELLNESS CENTRE

Title:

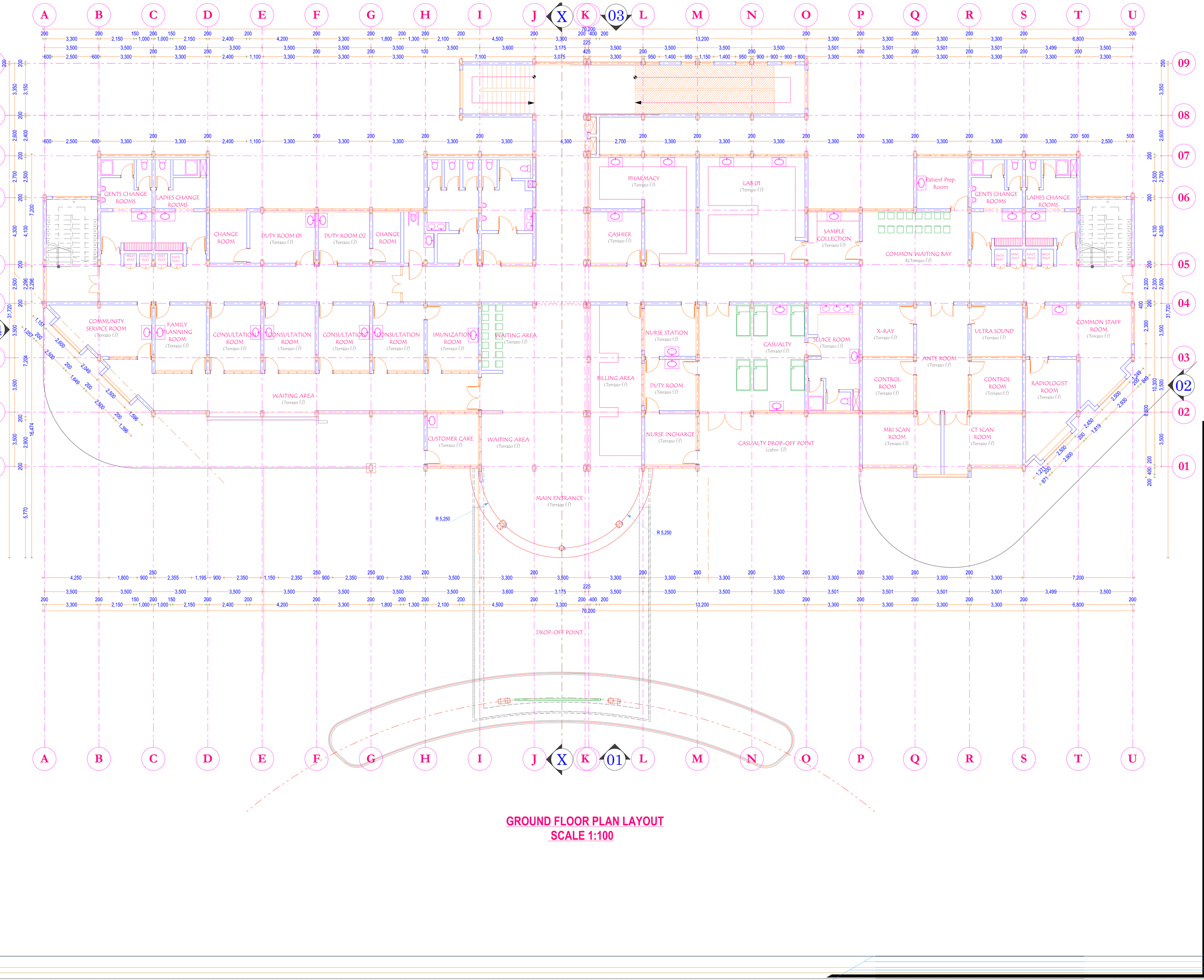
SITE PLAN

DRAWN	H.M
CHECKED	
APPROVED	G.C
Scale	As shown
Date	MAY, 2021

N

PRJ. NO DRW. NO 01

DE JOYCE LABOSO MEMORIAL MOTHER & CHILD WELFARE CENTRE.



GROUND FLOOR PLAN LAYOUT
SCALE 1:100

NOTES

01 This drawing shall be read in conjunction with the Engineer's drawings, any discrepancies MUST be reported to the Architect

02 Figured dimensions only to be taken from this drawing and all dimensions are in millimeters unless otherwise indicated

03 All r.c. works to structural engineer's detail

04 All windows and doors to have permanet vents as indicated

05 All vent pipes and flue pipes to be 1000 mm above eaves

06 All manhole covers in drive and parkings to be provided with heavy duty covers

07 All drain pipes under buildings, parkings and driveways to be encased into 150 mm thick concrete

REVISIONS

no.	date	description

CLIENT:

DEPARTMENT OF PUBLIC HEALTH AND MEDICAL SERVICES
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

Client's signature ..... Date .....

CONSULTANTS:

DEPARTMENT OF PUBLIC WORKS,
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

Architect's signature ..... Date .....

PROJECT:

PROPOSED MOTHER AND CHILD WELLNESS CENTRE.

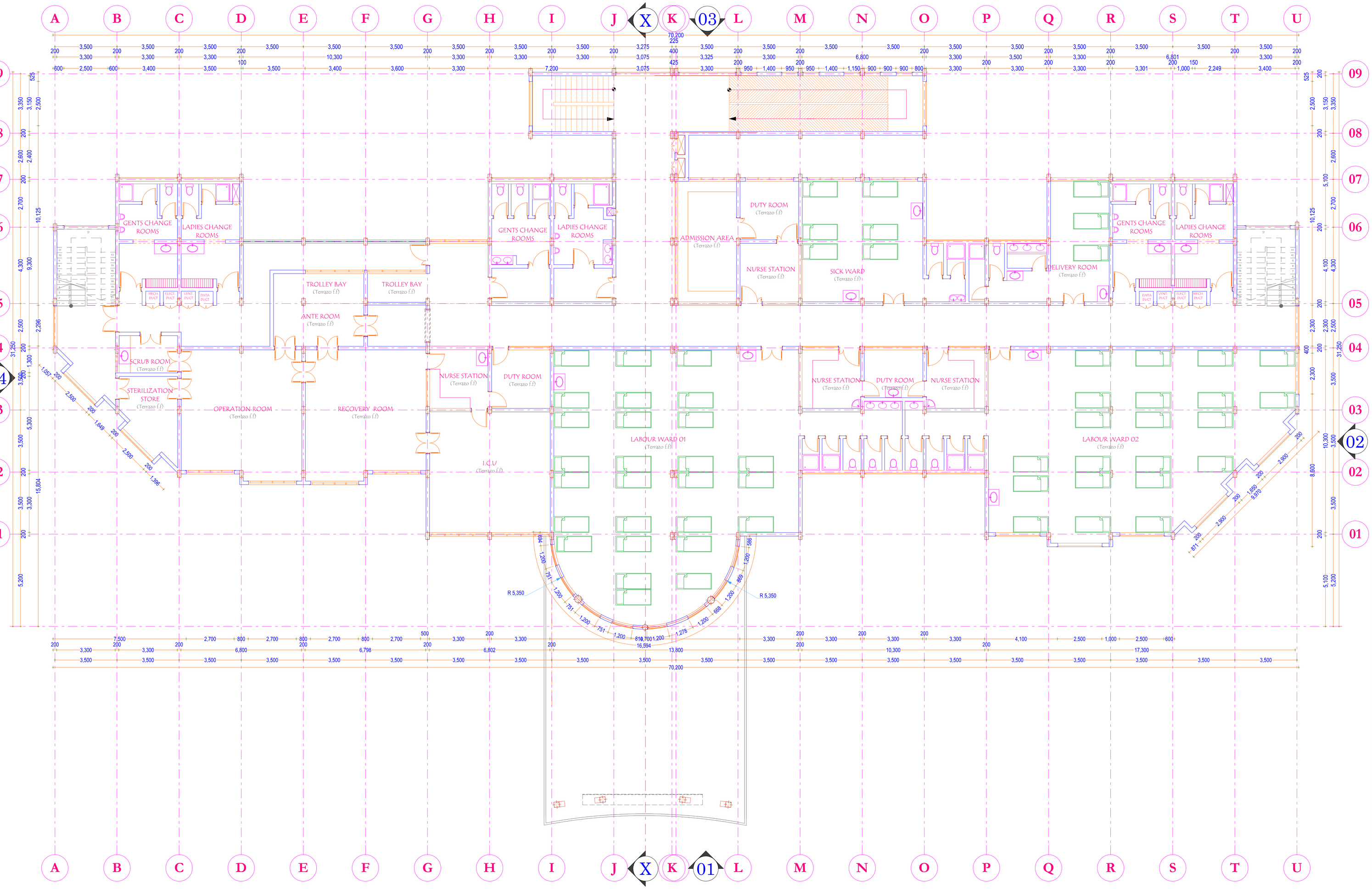
Title:

FLOOR PLANS LAYOUT

DRAWN	C.K
CHECKED	K.M
APPROVED	G.K
Scale	As shown
Date	APRIL. 2021
PRJ. NO	A/10
DRW. NO	01

N

DR. JOYCE LABOSO MEMORIAL MOTHER & CHILD WELLNESS CENTRE.



FIRST FLOOR PLAN LAYOUT
SCALE 1:100

NOTES

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REVISIONS

no.	date	description

CLIENT:

DEPARTMENT OF PUBLIC HEALTH AND MEDICAL SERVICES
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

Client's signature ..... Date .....

CONSULTANTS:

DEPARTMENT OF PUBLIC WORKS, COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

Architect's signature ..... Date .....

PROJECT:

PROPOSED MOTHER AND CHILD WELLNESS CENTRE.

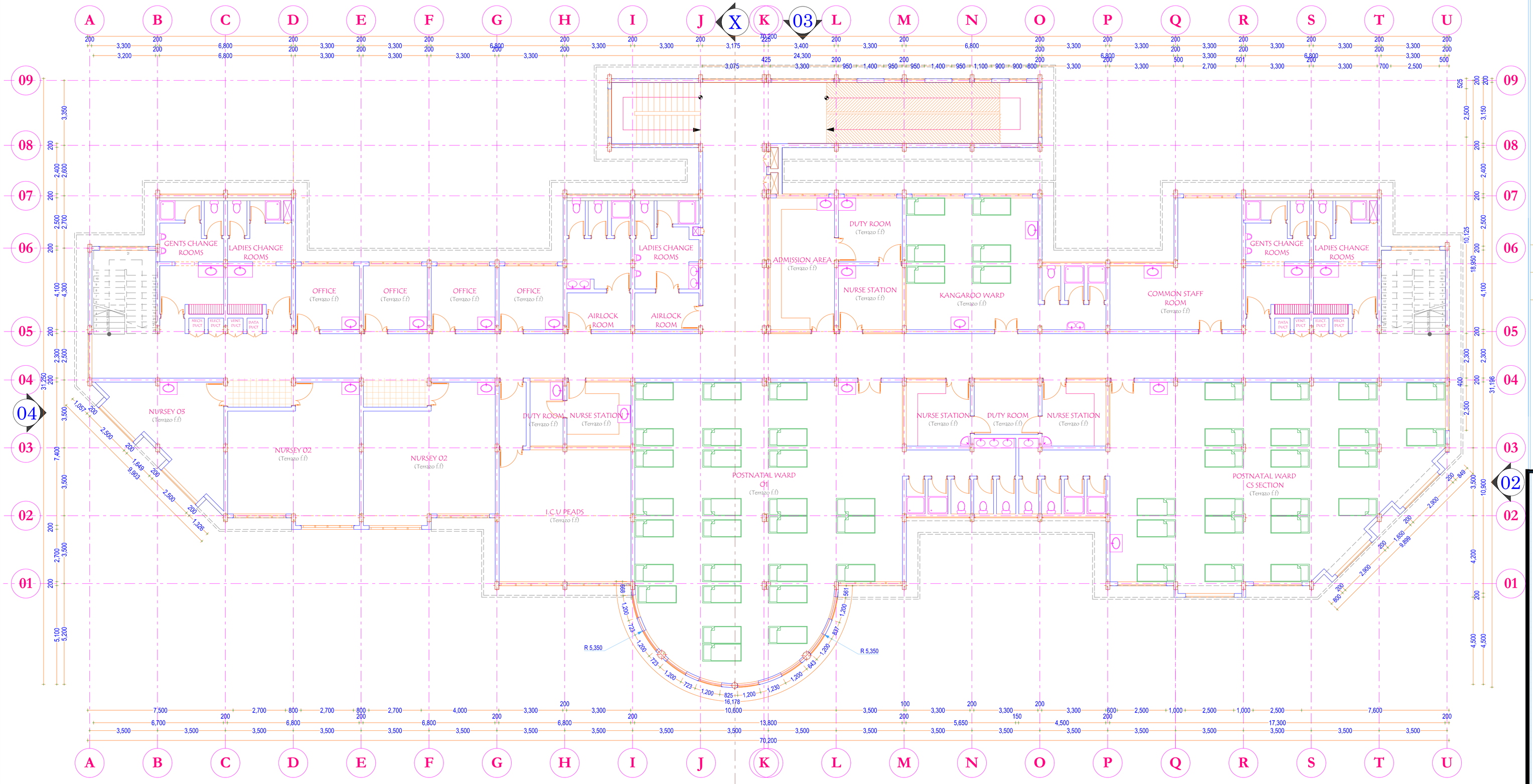
Title:

FLOOR PLANS LAYOUT

DRAWN	C.K
CHECKED	K.M
APPROVED	G.K
Scale	As shown
Date	APRIL. 2021
PRJ. NO	A/10
DRW. NO	01

N

DR. JOYCE LABOSO MEMORIAL MOTHER & CHILD WELLNESS CENTRE.



SECOND FLOOR PLAN LAYOUT
SCALE 1:100

NOTES

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06 All manhole covers in drive and parkings to be provided with heavy duty covers

07 All drain pipes under buildings, parkings and driveways to be encased into 150 mm thick concrete

REVISIONS

no.	date	description

CLIENT:
DEPARTMENT OF PUBLIC HEALTH AND MEDICAL SERVICES
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

Client's signature ..... Date .....

CONSULTANTS:
DEPARTMENT OF PUBLIC WORKS,
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

Architect's signature ..... Date .....

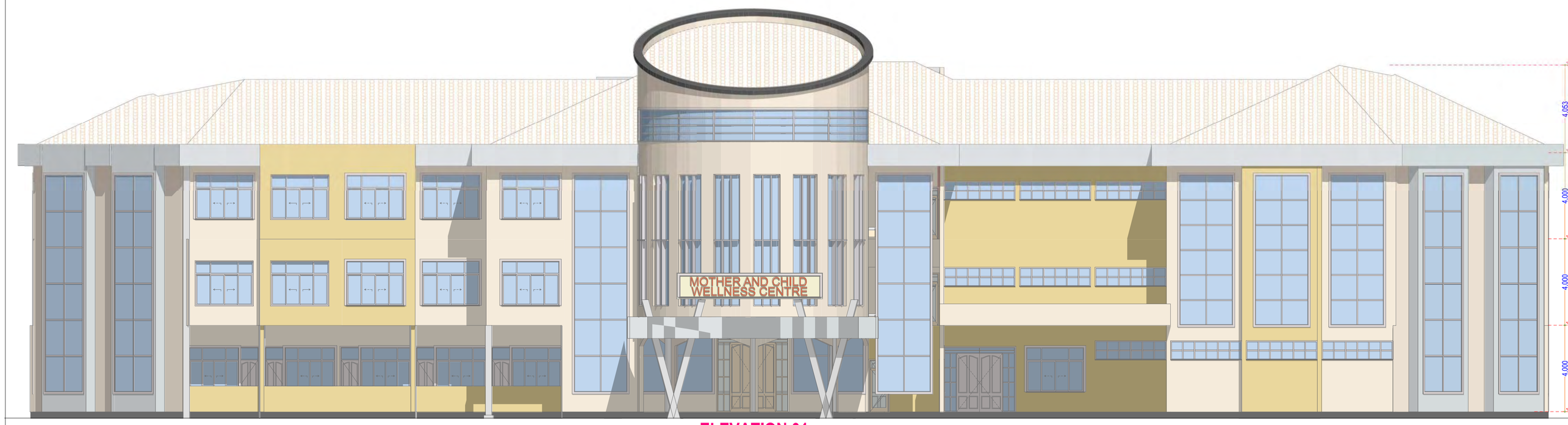
PROJECT:
PROPOSED MOTHER AND CHILD WELLNESS CENTRE.

Title:
FLOOR PLANS LAYOUT

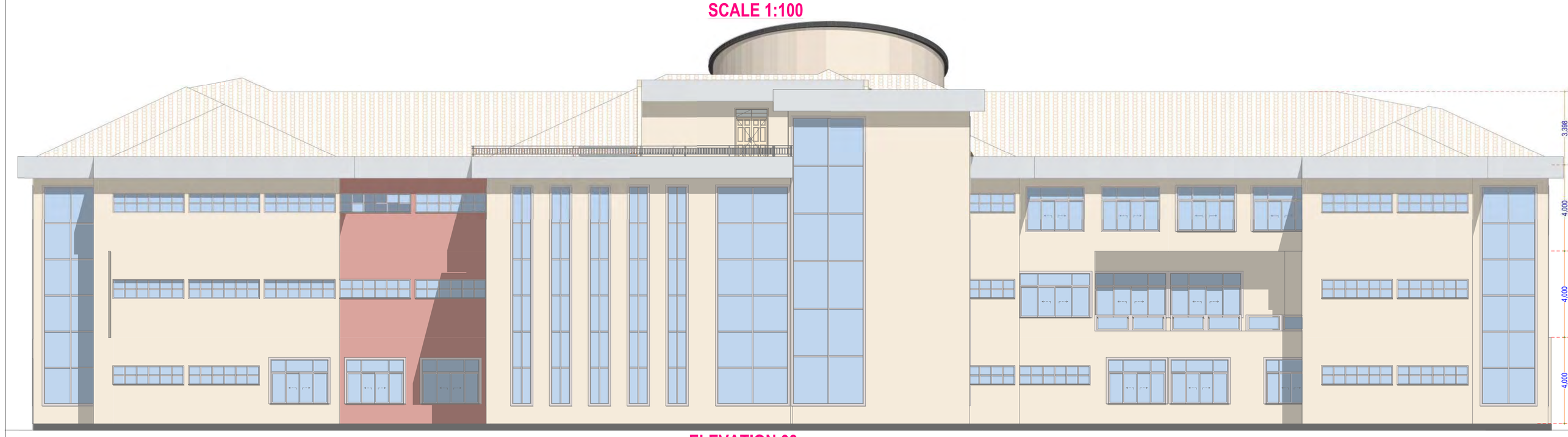
DRAWN	C.K
CHECKED	K.M
APPROVED	G.K
Scale	As shown
Date	APRIL. 2021
PRJ. NO	A/10
DRW. NO	01

N

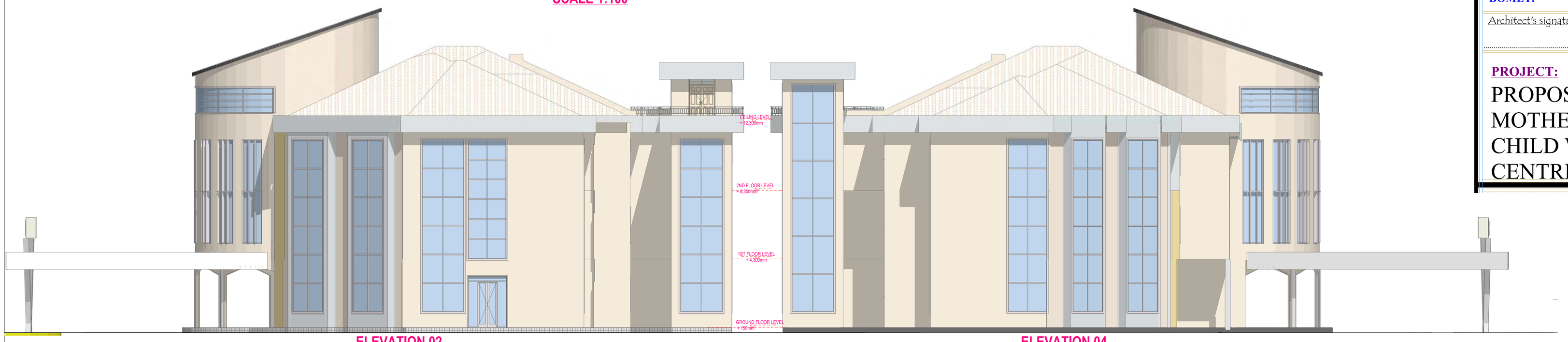
DR. JOYCE LABOSO MEMORIAL MOTHER & CHILD WELLNESS CENTRE.



ELEVATION 01
SCALE 1:100



ELEVATION 03
SCALE 1:100



ELEVATION 02
SCALE 1:100

ELEVATION 04
SCALE 1:100

ROOF SPECIFICATIONS:

i)
- PITCH 25 degrees
- 30 gauge pre-painted normal corrugated Roof covering sheets at 25 degreesfrom MRM or any other equal or approved by P.M on steel members to S.E details.

ii)
-600mmx1000mm high vibrated reinforced concrete gutter to later details.

iii)
-Flat roof to be fixed with Atactic polypropylene membrane with proper workmanship

WALL SPECIFICATIONS:

i)
- 200mm thick masonry superstructure wall; cement/sand;morta (mix1:3), 150mm thick internal superstructure wall; cement/sand;morta (mix1:3.

ii)
-X, ray, mri, ct scan and ultra roomss to have vibrated Reinforced Concrete wallings.

iii)
-Provide external wall finish as indicated on building elevations.

iv)
-450mm deep Vibrated Reinforced concrete ring beam to S.E details plastered and painted to approval.

FOUNDATIONS SPECIFICATIONS:

i)
- Foundation to S.E details.
450mm deep ground beam, 150mm thick conc. floor salb (mix 1:1:4), plus B.R.C A142 laid on 1000 gauge polythebne sheeting, plus anti-termite treatment on 50mm murram blinding on welll compacted hardcore.

ii) -200mm thick natural stone substructure wall. 600x200mm conc. pad foundation on soil substratum with adequate withsatnding strength of transmitted foundation loads.

STRUCTURAL SPECIFICATIONS:

i)
- Beam= 450mmx200mm.

ii)
-slab = 150mm thick.

iii)
-R.C staircase+=300mm threads & 150mm Risers.

FLOOR SPECIFICATIONS:

i)
Terrazo floor finish with proper workmanship

NOTES

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03 All r.c. works to structural engineer's detail

04 All windows and doors to have permanet vents as indicated

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06 All manhole covers in drive and parkings to be provided with heavy duty covers

07 All drain pipes under buildings, parkings and driveways to be encased into 150 mm thick concrete

REVISIONS

no.	date	description

CLIENT:

DEPARTMENT OF PUBLIC HEALTH AND MEDICAL SERVICES
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

Client's signature ..... Date .....

CONSULTANTS:

DEPARTMENT OF PUBLIC WORKS,
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

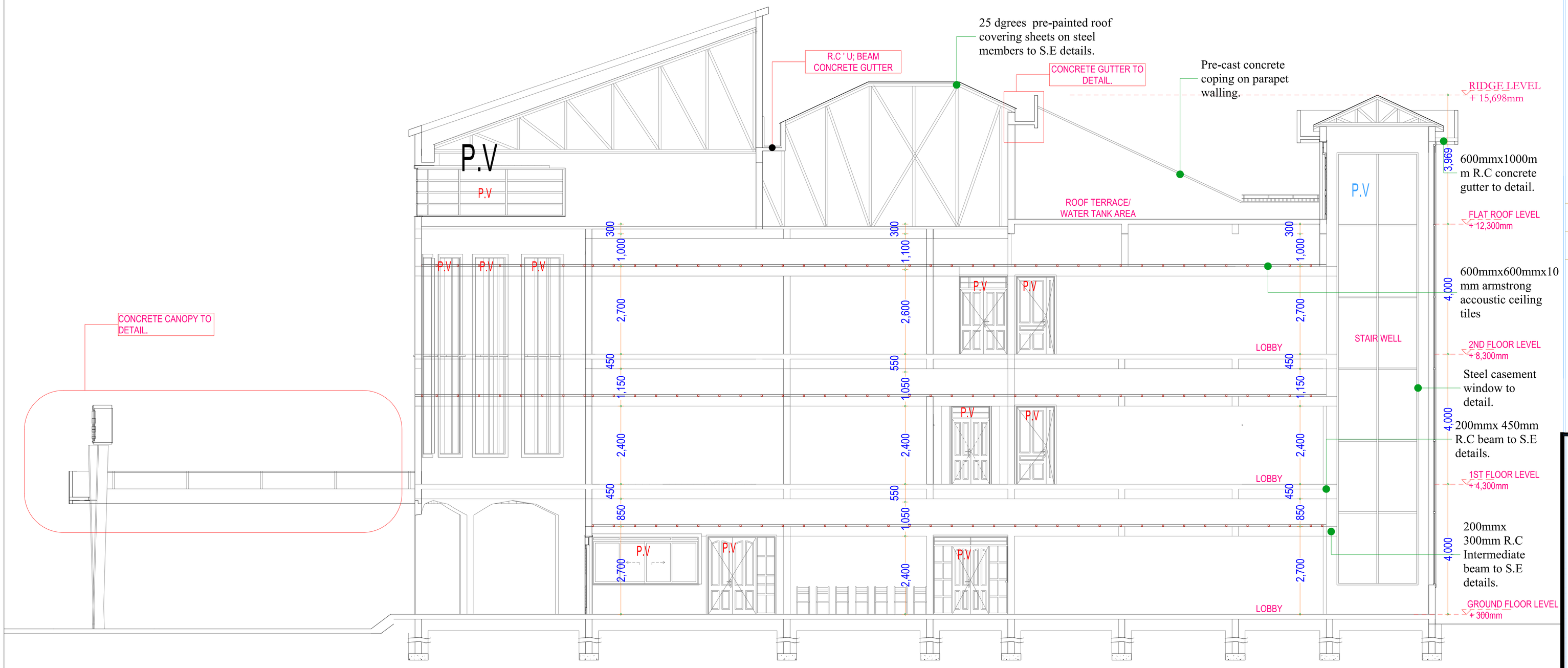
Architect's signature ..... Date .....

PROJECT:

PROPOSED MOTHER AND CHILD WELLNESS CENTRE.

PRJ. NO A/10 DRW. NO 01

DR. JOYCE LABOSO MEMORIAL MOTHER & CHILD WELLNESS CENTRE.



FOUNDATION NOTES:
600mmx200mm R.C strip foundation to S.E details

SITE PREPARATION NOTES :
Vegatable/loose & black cotton soils to be excavated and cart away.

SUB-STRUCTURE NOTES:
100mm R.C floor slab on 1000 gauge dpc membrane on 50mm sand/murram blinding on ateast 300mm thick well compacted hardcore to S.E details.

SECTION X-X
SCALE 1:100

NOTES

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REVISIONS

no.	date	description

CLIENT:
DEPARTMENT OF PUBLIC HEALTH AND MEDICAL SERVICES
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

Client's signature ..... Date .....

CONSULTANTS:
DEPARTMENT OF PUBLIC WORKS,
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

Architect's signature ..... Date .....

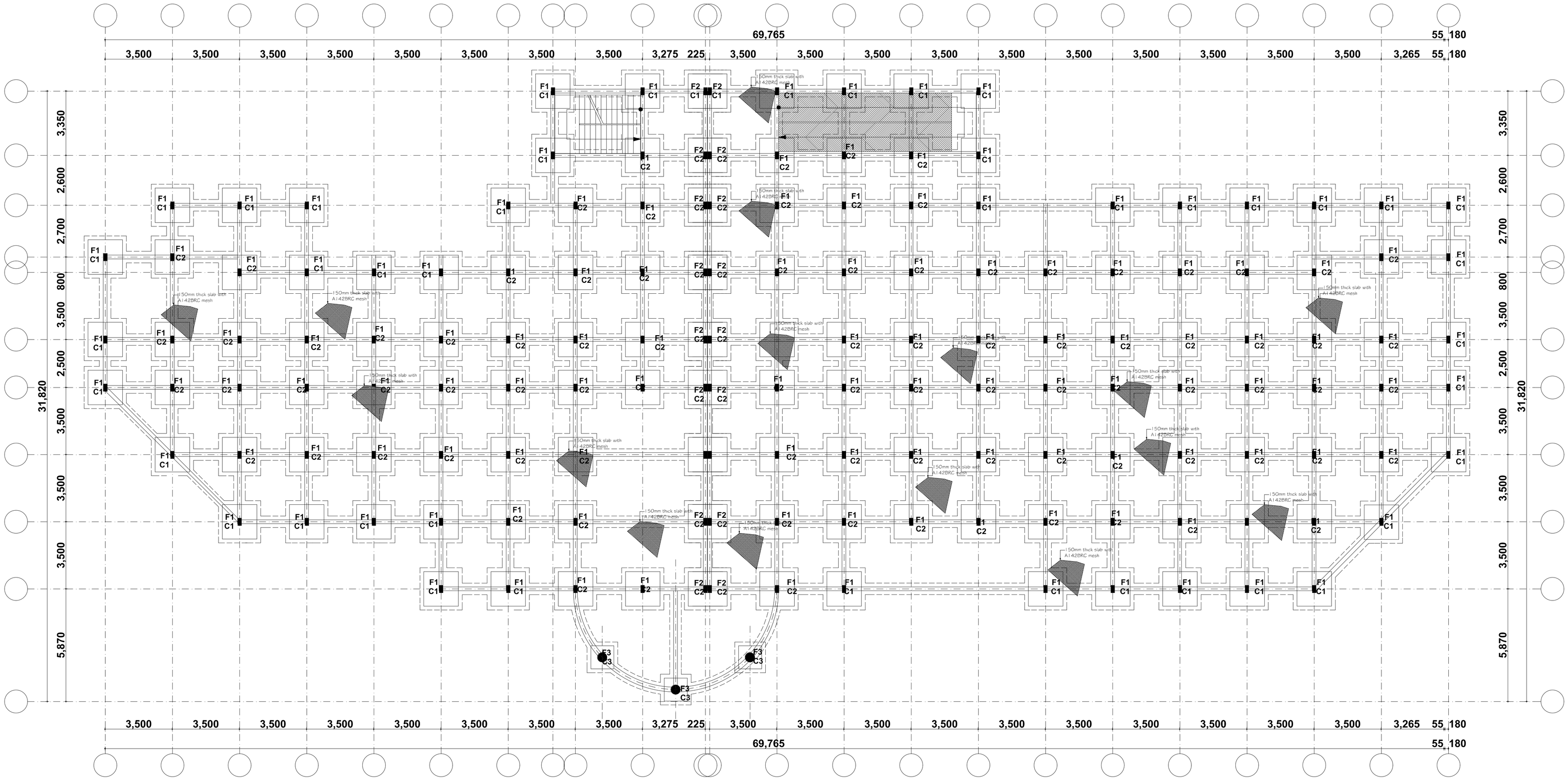
PROJECT:
PROPOSED MOTHER AND CHILD WELLNESS CENTRE.

Title:
FLOOR PLANS LAYOUT

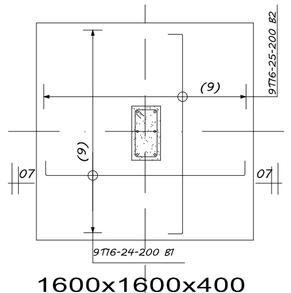
DRAWN	C.K
CHECKED	K.M
APPROVED	G.K
Scale	As shown
Date	APRIL. 2021
PRJ. NO	A/10
DRW. NO	01

N

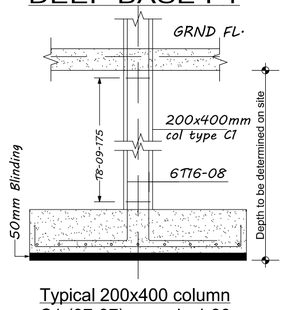
DR. JOYCE LABOSO MEMORIAL MOTHER & CHILD WELLNESS CENTRE.



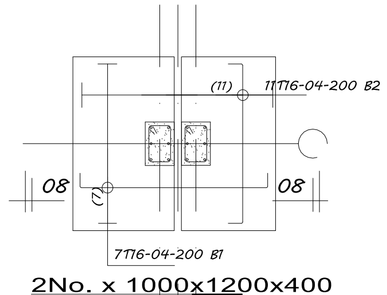
FOUNDATION LAYOUT AND SUBSTRUCTURE DETAILS Scale 1:110



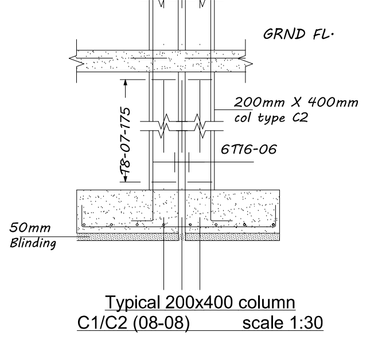
1600x1600x400
DEEP BASE F1



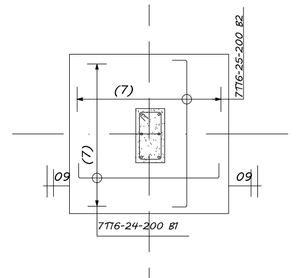
Typical 200x400 column
C1 (07-07) scale 1:30



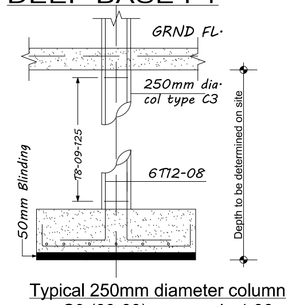
2No. x 1000x1200x400
DEEP BASE F3



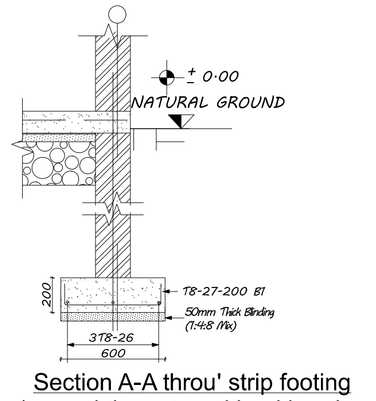
Typical 200x400 column
C1/C2 (08-08) scale 1:30



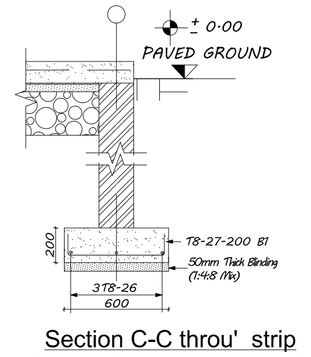
1200x1200x400
DEEP BASE F1



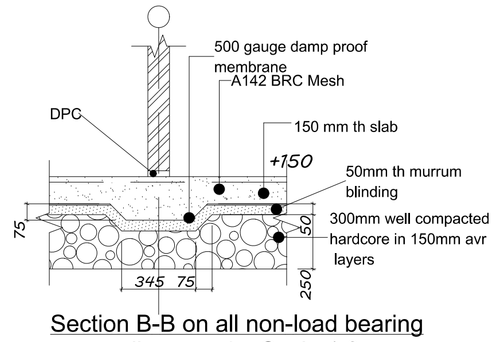
Typical 250mm diameter column
C3 (09-09) scale 1:30



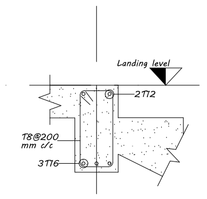
Section A-A throu' strip footing (around the external load bearing walls) Scale 1:25



Section C-C throu' strip footing (around verandah) Scale 1:35



Section B-B on all non-load bearing walls around Scale 1:35



TYPICAL 200X400mm Landing beam, BM04 Scale 1:20

1. All dimensions are in millimeters, unless otherwise stated.
2. This drawing must not be scaled ,only figured dimensions should be used.
3. This drawing must be read in conjuction with relevant Architectural drawings.
4. Reinforced concrete to be grade 20/20 to BS 8110.
5. Cover to main reinforcement to be as follows:
   (a) Foundation = 50mm
   (b) Columns = 40mm
   (c) Beams = 30mm
   (d) Slabs = 20mm
6. "T" Denotes Ribbed bars to BS 4461.
7. All Reinforcements must be inspected by the Engineer before being enclosed in the formwork.
9. All masonry walls must be reinforced with 25mm hoop iron after every two alternate courses. The hoop iron must be extended through the column sections.
10. To ensure enhanced bonding between the masonry and the R.C. columns, the masonry walling must be raised first before the columns are casted.
11. All mortar used to be of cement sand mix 1:3, with all the stone walling being laid in 200mm courses with 12mm mortar joints.
12. A minimum of 7.0N/mm2 average compressive strength of masonry in accordance with BS5390 should be used for all wall sections.
13. Foul water drainage to drain to septic tank and to structural details.
14. Mass concrete to be grade 15

REVISIONS

Date	Suffix	Descriptions

PROJECT
PROPOSED MOTHER AND CHILD WELLNESS CENTRE ON PLOT LR. NO. .....
.....

CLIENT
DEPARTMENT OF PUBLIC HEALTH AND MEDICAL SERVICES
COUNTY GOVERNMENT OF BOMET
P.O. BOX 19-20400, BOMET

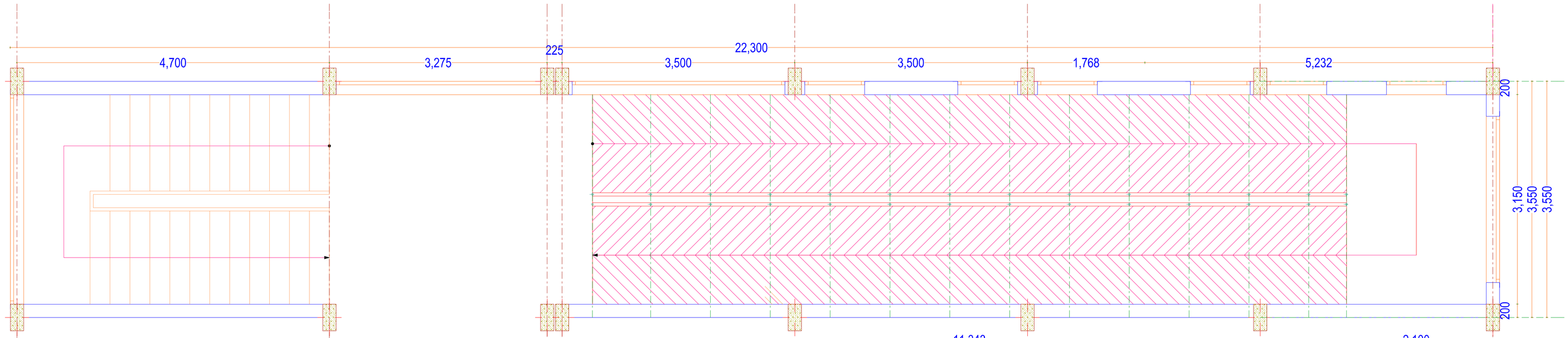
TITLE STRUCTURAL DRAWINGS

DRAWINGS DETAILS

SLAB REINFORCEMENT DETAILS
BEAMS DETAILS
COLUMNS DETAILS
STAIR CASES STRUCTURAL DETAILS
FOUNDATION LAYOUT
FOOTING DETAILS
BEAMS AND COLUMNS LAYOUT
FOUNDATION PROFILE

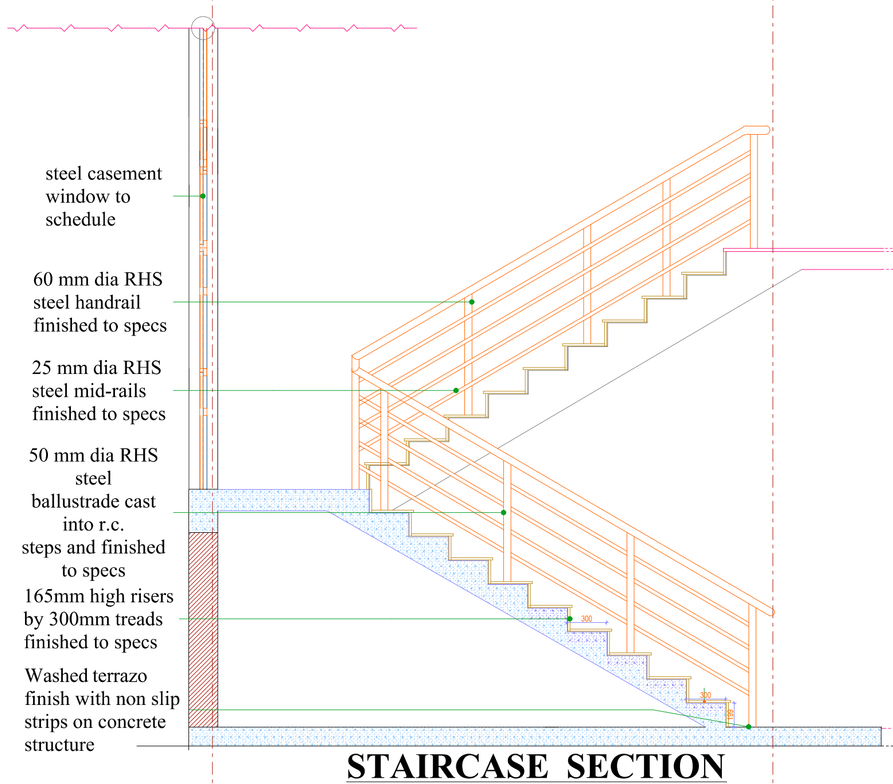
Designed	PUBLIC WORKS, BOMET COUNTY	Scale(s)	As indicated below each drawing
Drawn		Date	JUL., 2021
Checked			
JOB No.		DRG No.	

CIVIL & STRUCTURAL ENGINEER APPROVAL

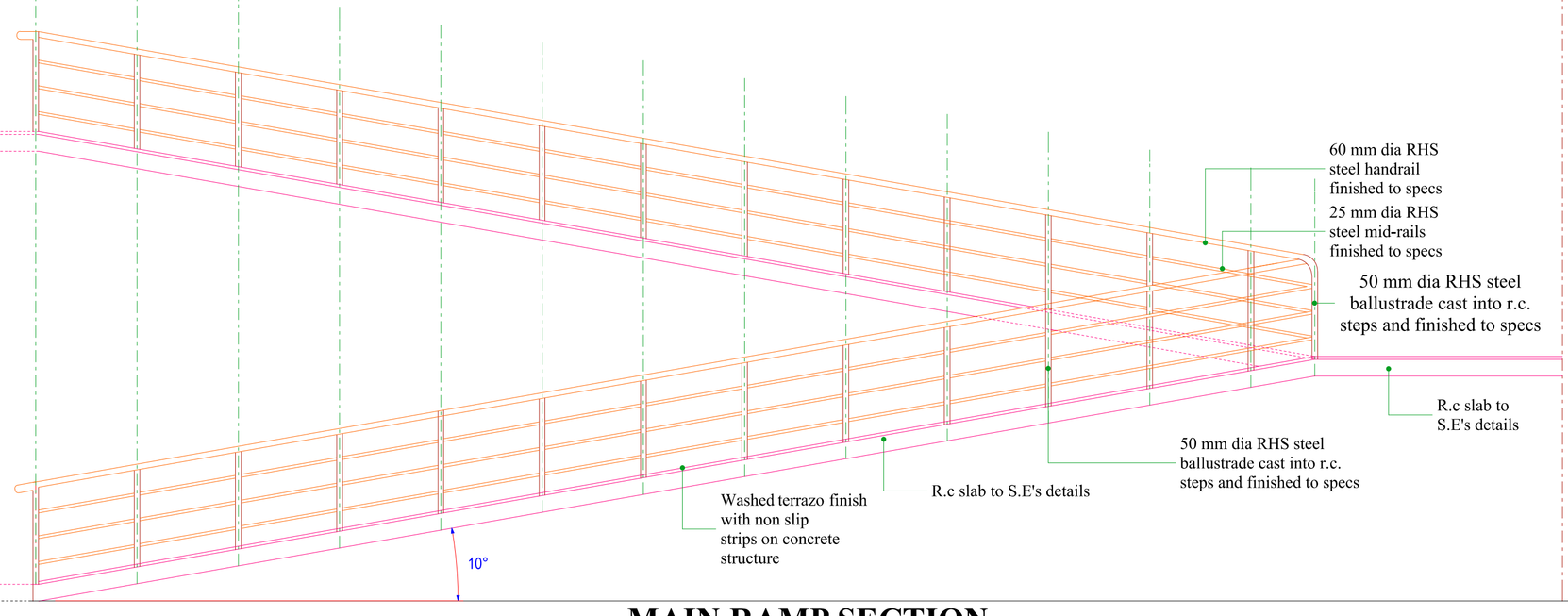


STAIRCASE FLOOR PLAN
SCALE 1:20

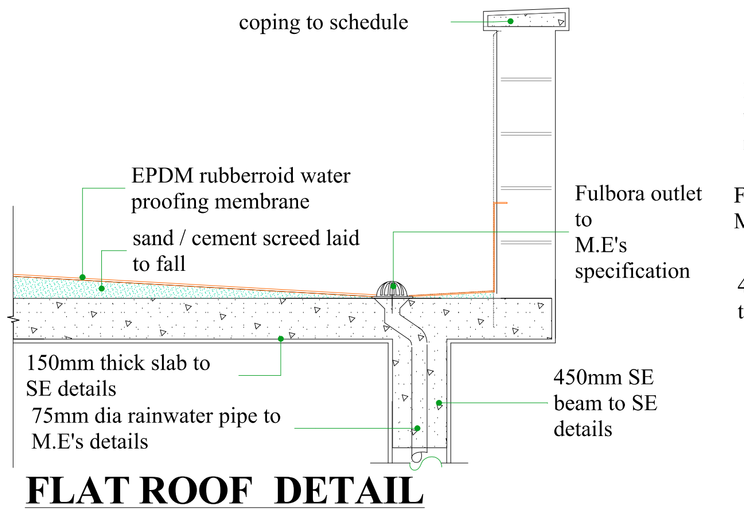
MAIN RAMP FLOOR PLAN
SCALE 1:20



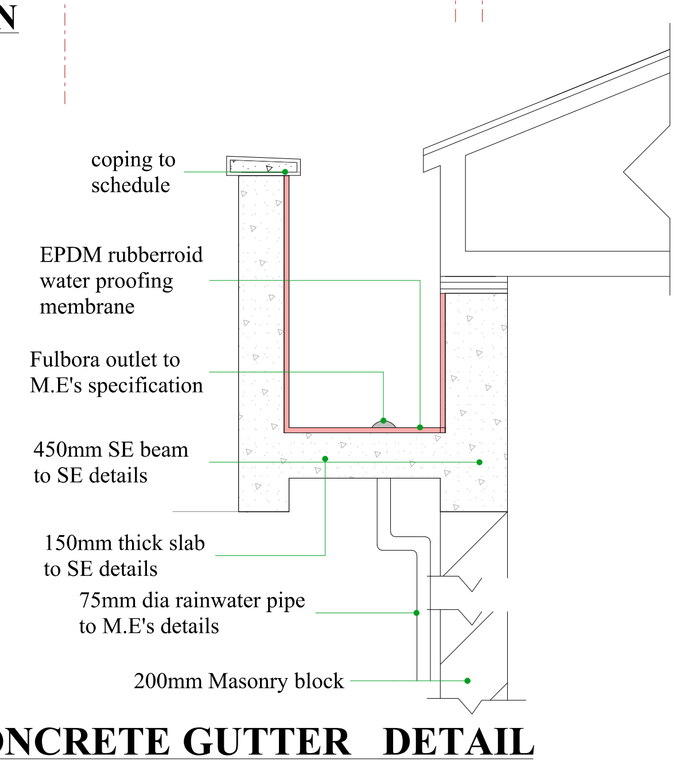
STAIRCASE SECTION
SCALE 1:20



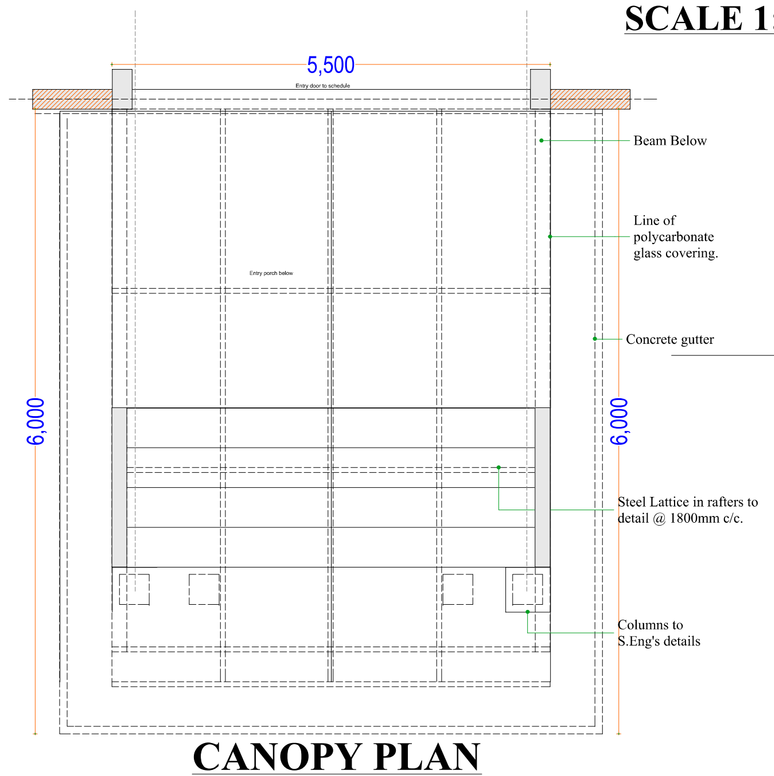
MAIN RAMP SECTION
SCALE 1:20



FLAT ROOF DETAIL
SCALE 1:10



CONCRETE GUTTER DETAIL
SCALE 1:10



CANOPY PLAN
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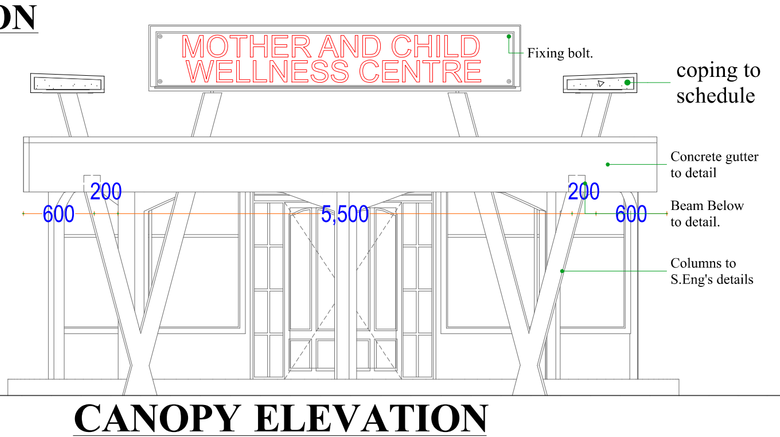

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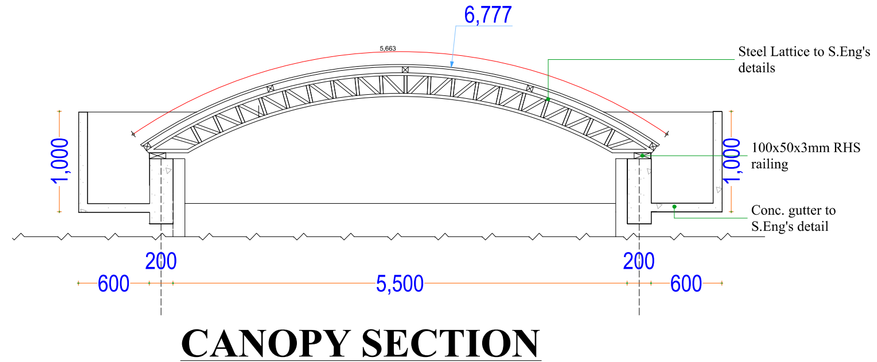

CANOPY SECTION
SCALE 1:10

NOTES

01 This drawing shall be read in conjunction with the Engineer's drawings, any discrepancies MUST be reported to the Architect

02 Figured dimensions only to be taken from this drawing and all dimensions are in millimeters unless otherwise indicated

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04 All windows and doors to have permanet vents as indicated

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06 All manhole covers in drive and parkings to be provided with heavy duty covers

07 All drain pipes under buildings, parkings and driveways to be encased into 150 mm thick concrete

REVISIONS

no.	date	description

DR. JOYCE LABOSO MEMORIAL MOTHER & CHILD WELLNESS CENTRE.

CLIENT:
DEPARTMENT OF PUBLIC HEALTH AND MEDICAL SERVICES
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

Client's signature ..... Date .....

CONSULTANTS:
DEPARTMENT OF PUBLIC WORKS,
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

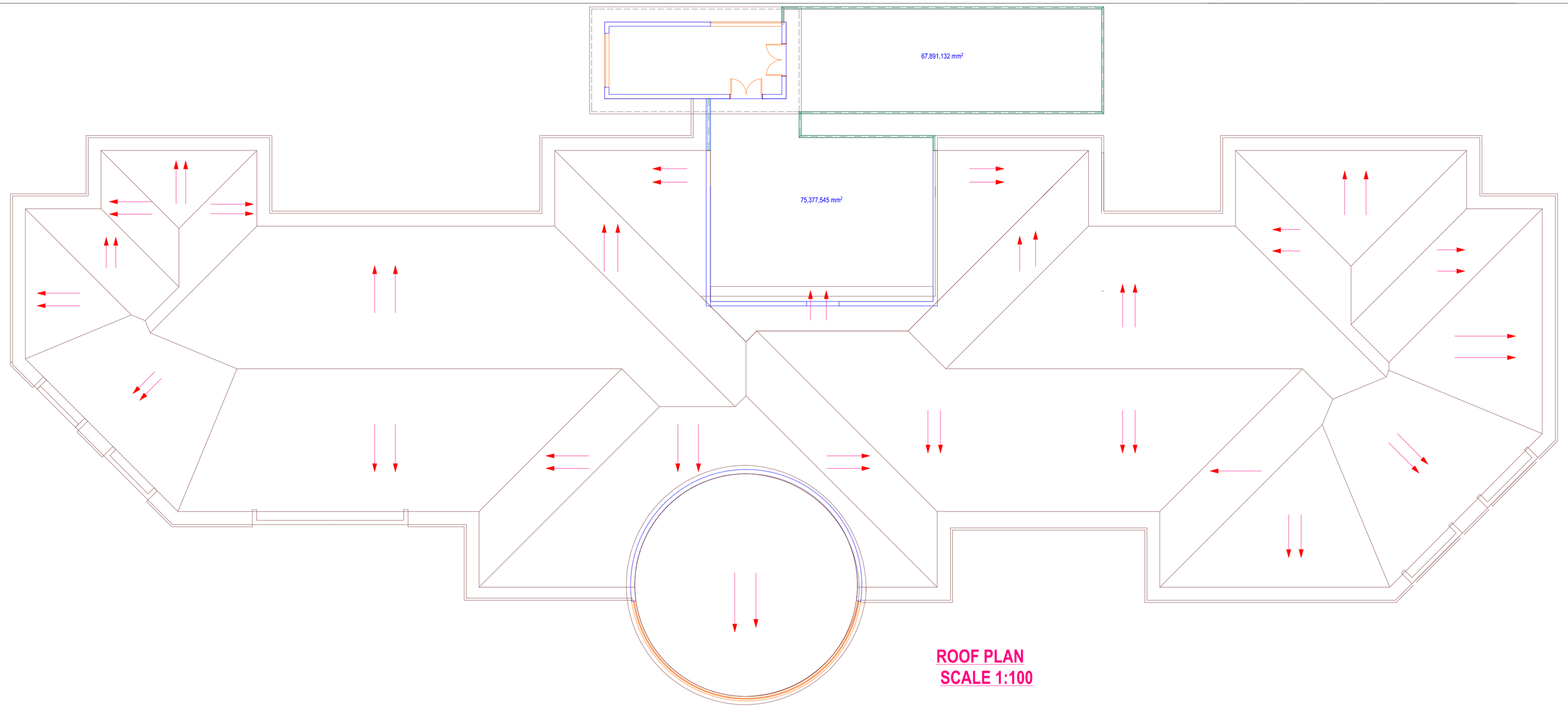
Architect's signature ..... Date .....

PROJECT:
PROPOSED MOTHER AND CHILD WELLNESS CENTRE.

Title:
FLOOR PLANS LAYOUT

DRAWN	C.K
CHECKED	K.M
APPROVED	G.K
Scale	As shown
Date	APRIL. 2021
PRJ. NO	A/10
DRW. NO	01

N



ROOF PLAN
SCALE 1:100

FLAT ROOF
FLAT ROOF
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VALLEY TRUSS 3
VALLEY TRUSS 2
VALLEY TRUSS 1
HIP TRUSS 14
HIP TRUSS 13
HIP TRUSS 12
HIP TRUSS 11
HIP TRUSS 10
HIP TRUSS 9
HIP TRUSS 8
HIP TRUSS 7
HIP TRUSS 6
HIP TRUSS 5
HIP TRUSS 4
HIP TRUSS 3
HIP TRUSS 2
HIP TRUSS 1
TRUSS 1A
TRUSS 1B
TRUSS 1C
TRUSS 1D
TRUSS 1E
TRUSS 1F
TRUSS 1G
TRUSS 1
TRUSS 2A
TRUSS 2B
TRUSS 2C
TRUSS 2D
TRUSS 2E
TRUSS 2F
TRUSS 2G
TRUSS 2H
TRUSS 2I
TRUSS 2J
TRUSS 2K
TRUSS 2L
TRUSS 2M
TRUSS 2N
TRUSS 2O
TRUSS 3A
TRUSS 3B
TRUSS 3C
TRUSS 3D
TRUSS 3E
TRUSS 3F
TRUSS 3G
TRUSS 3H
TRUSS 3I
TRUSS 3J
TRUSS 3K
TRUSS 4A
TRUSS 4B
TRUSS 4C
TRUSS 4D
TRUSS 4E
TRUSS 4F
TRUSS 4G
TRUSS 4H
TRUSS 4I
TRUSS 4J
TRUSS 4K
TRUSS 5A
TRUSS 5B
TRUSS 5C
TRUSS 6A
TRUSS 6B
TRUSS 6C
TRUSS 6D
TRUSS 6E
TRUSS 6F
TRUSS 6G
TRUSS 7A
TRUSS 7B
TRUSS 7C
TRUSS 7D
TRUSS 7E
TRUSS 8A
TRUSS 8B
TRUSS 8C
TRUSS 8D
TRUSS 8E
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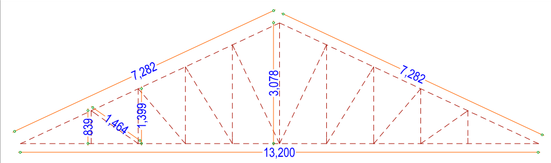
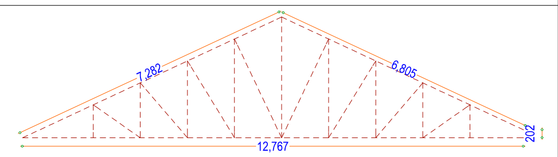
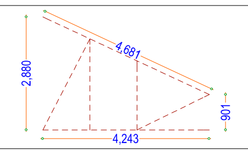
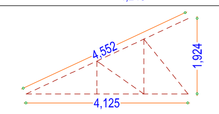
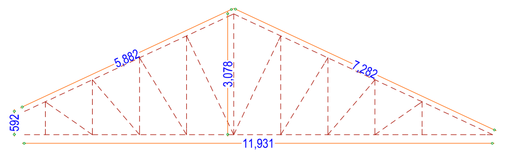
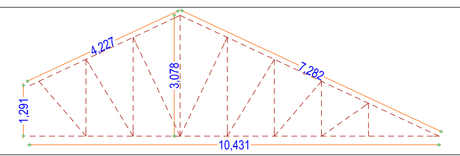
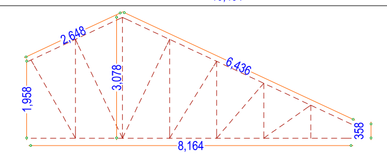
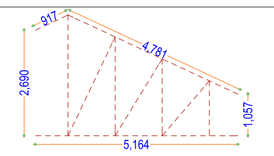
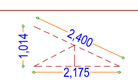
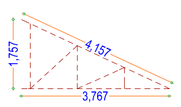
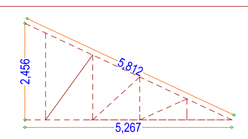
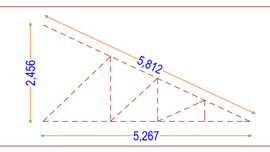
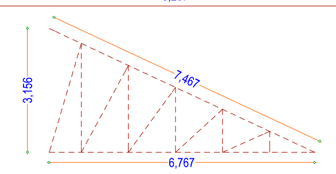
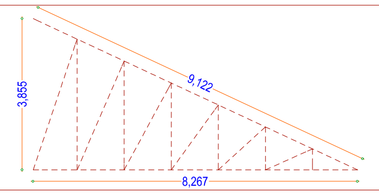
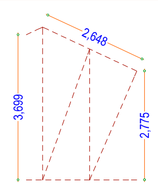
TRUSS 1		9
TRUSS 1 A		1
TRUSS 1 B		1
TRUSS 1 C		1
TRUSS 1 D		1
TRUSS 1 E		1
TRUSS 1F		1
TRUSS 1G		1
TRUSS 2A		1
TRUSS 2B		2
TRUSS 2B		2
TRUSS 2C		2
TRUSS 2D		2
TRUSS 2E		2
TRUSS 2F		2

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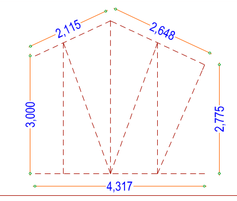
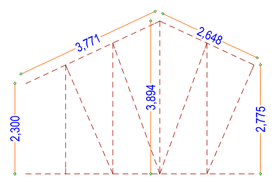
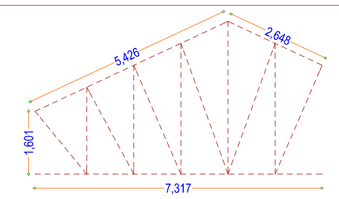
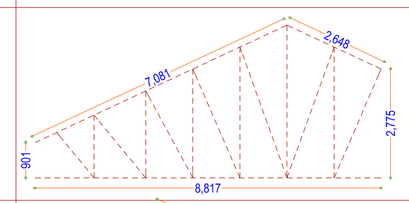
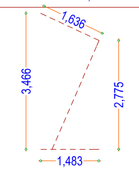
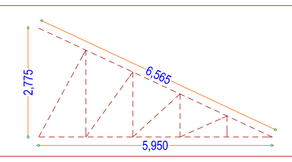
TRUSS 2G		1
TRUSS 2H		1
TRUSS 2I		1
TRUSS 2J		1
TRUSS 2K		1
TRUSS 2L		1
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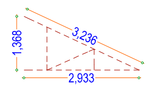
TRUSS 2N		1
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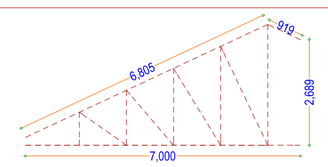
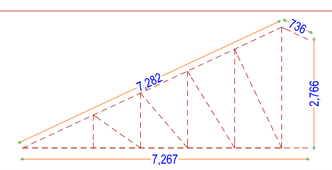
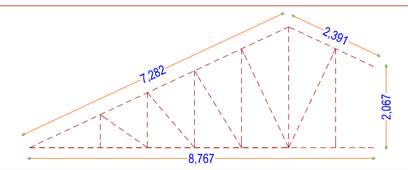
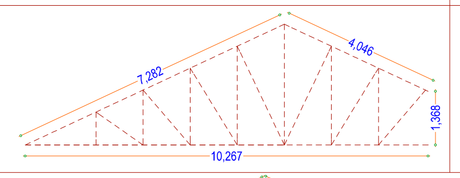
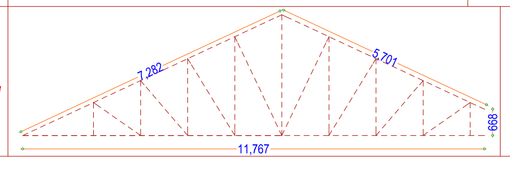
TRUSS 3 A		1
TRUSS 3 B		1
TRUSS 3 C		1
TRUSS 3 D		1
TRUSS 3 E		1

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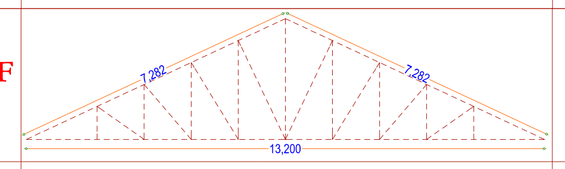
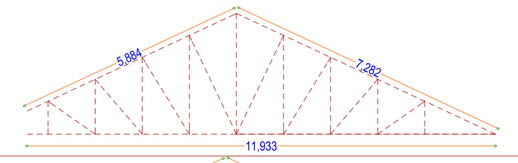
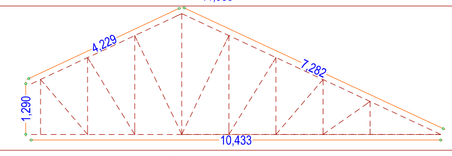
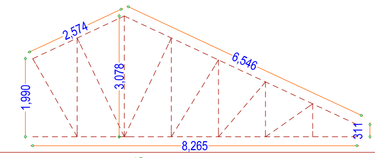
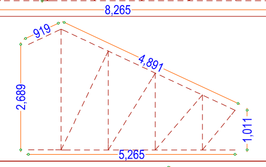
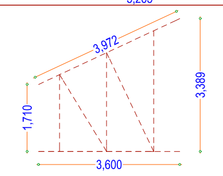
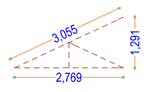
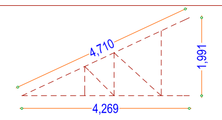
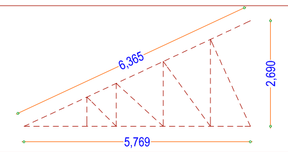
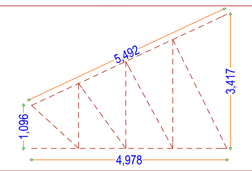
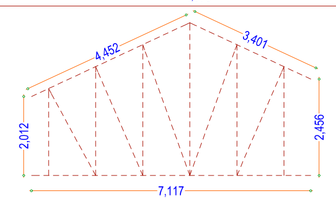
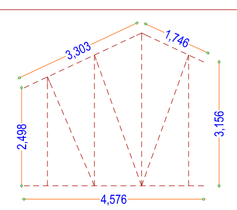
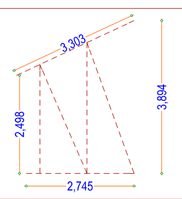
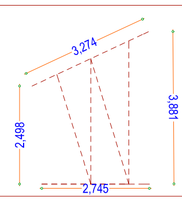
TRUSS 3 F		1
TRUSS 3 G		1
TRUSS 3 H		1
TRUSS 3 I		1
TRUSS 3 J		1
TRUSS 3 A		1
TRUSS 4 A		1
TRUSS 4 B		1
TRUSS 4 C		1
TRUSS 4 D		1
TRUSS 4 E		1
TRUSS 4 F		1
TRUSS 4 G		1
TRUSS 4 H		1

NOTES

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07 All drain pipes under buildings, parkings and driveways to be encased into 150 mm thick concrete

REVISIONS

no.	date	description

CLIENT:

DEPARTMENT OF PUBLIC HEALTH AND MEDICAL SERVICES
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

Client's signature | Date

CONSULTANTS:

DEPARTMENT OF PUBLIC WORKS,
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

Architect's signature | Date

PROJECT:

PROPOSED MOTHER AND CHILD WELLNESS CENTRE.

Title:

FLOOR PLANS LAYOUT

DRAWN	C.K
CHECKED	K.M
APPROVED	G.K
Scale	As shown
Date	APRIL. 2021
PRJ. NO	A/10
DRW. NO	01

N

DR. JOYCE LABOSO MEMORIAL MOTHER & CHILD WELLNESS CENTRE.

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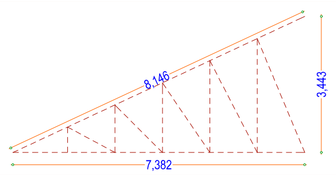
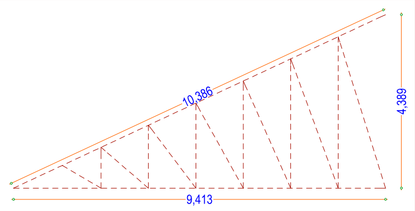
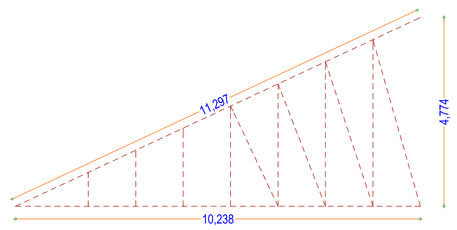
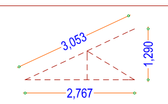
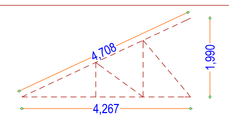
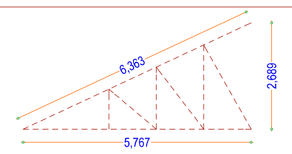
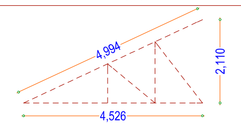
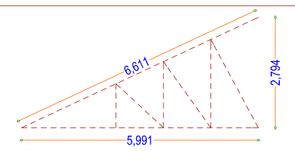
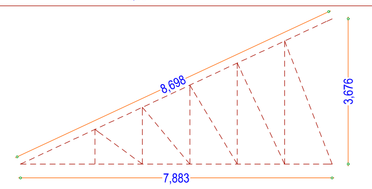
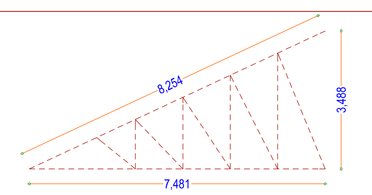
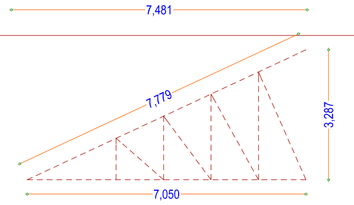
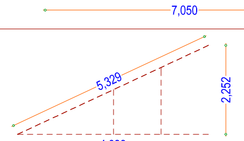
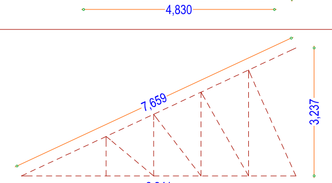
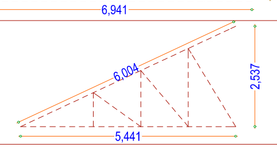
TRUSS 5 A		1
TRUSS 5 B		1
TRUSS 5 C		1
TRUSS 6 A		2
TRUSS 6 B		1
TRUSS 6 C		1
TRUSS 6 D		1
TRUSS 6 E		1
TRUSS 6 F		1
TRUSS 6G		1
TRUSS 6H		2
TRUSS 7A		1
TRUSS 7B		1
TRUSS 7C		1

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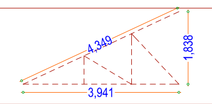
TRUSS 7 D		1
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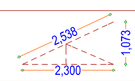
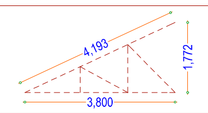
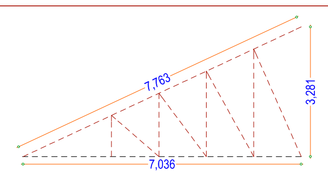
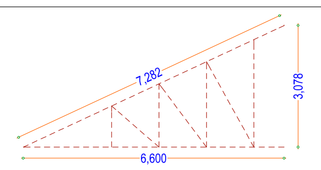
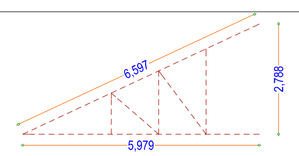
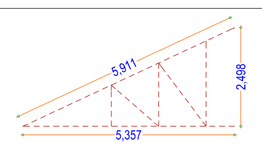
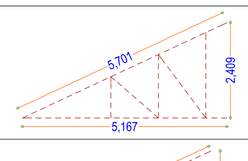
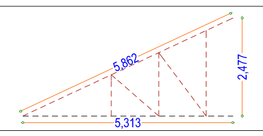
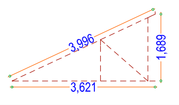
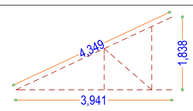
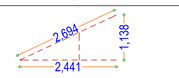
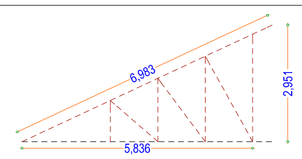
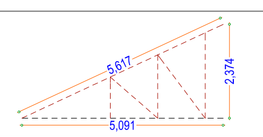
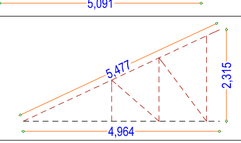
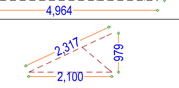
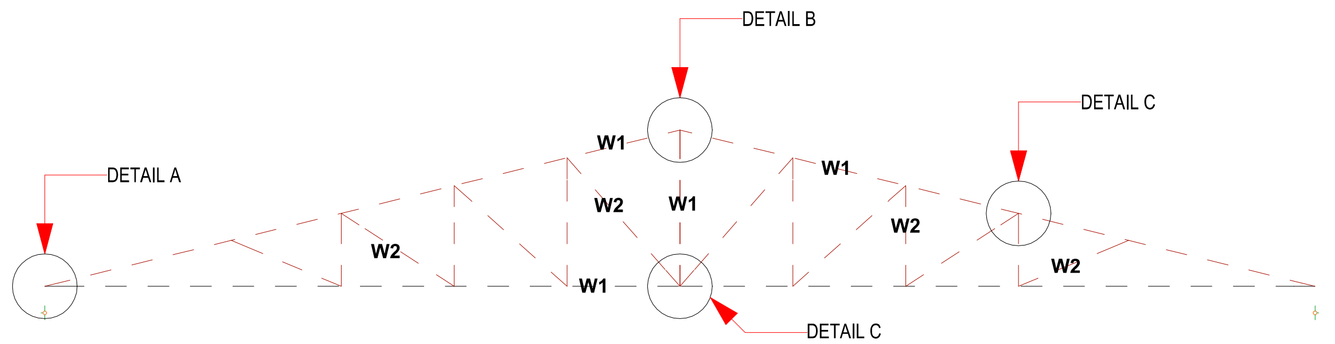
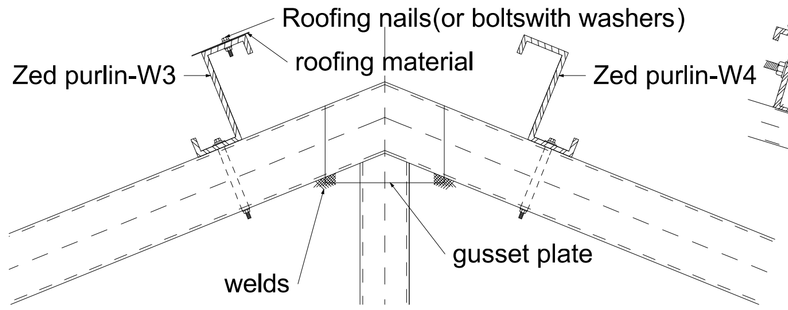
TRUSS 8A		2
TRUSS 8B		2
HIP TRUSS 1		2
HIP TRUSS 2		2
HIP TRUSS 3		2
HIP TRUSS 4		2
HIP TRUSS 5		2
HIP TRUSS 6		2
HIP TRUSS 7		2
HIP TRUSS 8		2
HIP TRUSS 9		2
HIP TRUSS 10		2
HIP TRUSS 11		2
HIP TRUSS 12		2
HIP TRUSS 13		2





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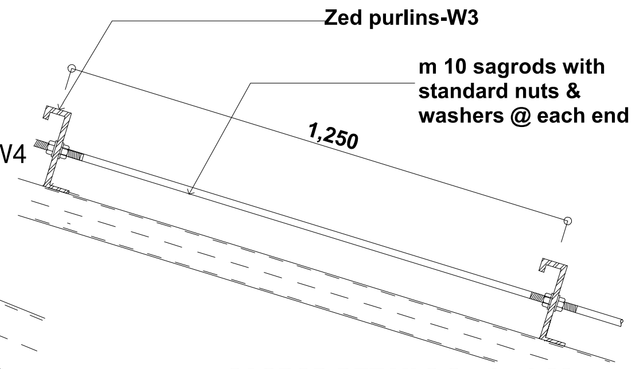
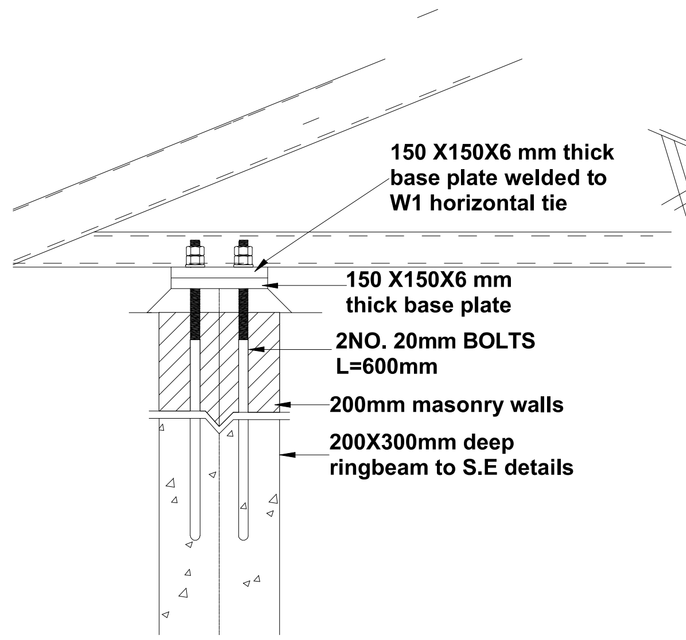
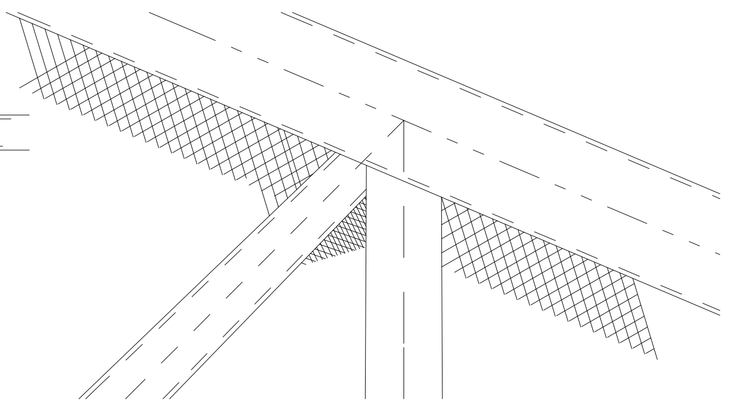


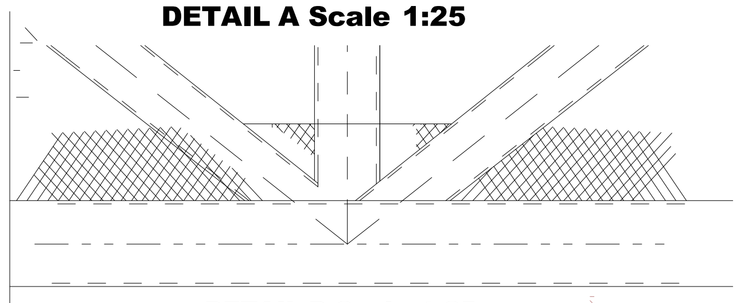
SAGROD DETAILS Scale 1:30



DETAIL A Scale 1:25



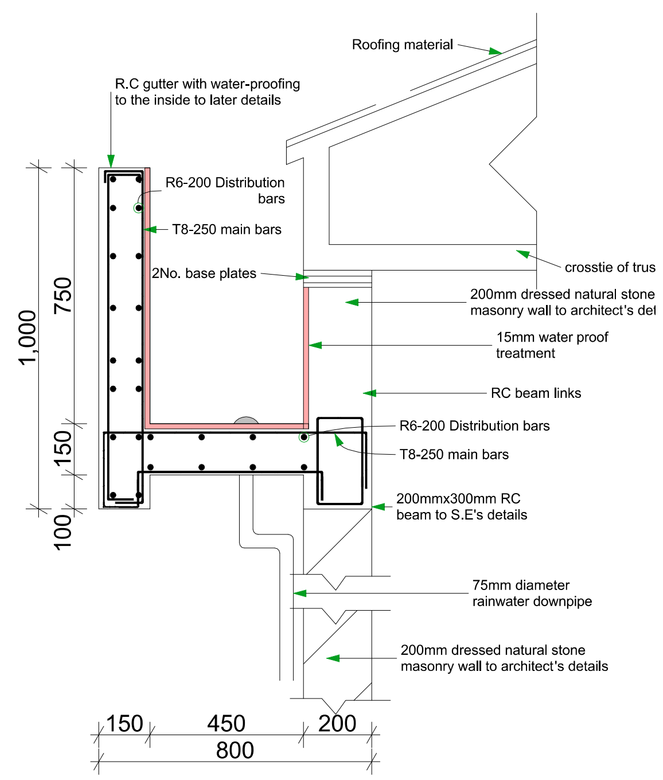
DETAIL C Scale 1:25



DETAIL D Scale 1:25

MEMBER SCHEDULE

MARK	DESCRIPTION	SIZE(mm)
W1	TOP RAFTERS, KINGPOST & HORIZONTALTIE	75X75X4 SHS
W2	-WEB MEMBERS(STRUTS AND TIES) -TOP AND BOTTOM CHORD -HORIZONTAL TIE	50X50X3 SHS
W3	WEB MEMBERS (STRUTS AND TIES)	25X25X2.5 SHS
W4	LC- PURLINS	Z-10020 (i.e. 102x53x49x14x2.0)
Sagrods	Sagrods	M10



SECTION A-A Scale 1:25

NOTES

01 This drawing shall be read in conjunction with the Engineer's drawings, any discrepancies MUST be reported to the Architect

02 Figured dimensions only to be taken from this drawing and all dimensions are in millimeters unless otherwise indicated

03 All r.c. works to structural engineer's detail

04 All windows and doors to have permanet vents as indicated

05 All vent pipes and flue pipes to be 1000 mm above eaves

06 All manhole covers in drive and parkings to be provided with heavy duty covers

07 All drain pipes under buildings, parkings and driveways to be encased into 150 mm thick concrete

REVISIONS

no.	date	description

CLIENT:

DEPARTMENT OF PUBLIC HEALTH AND MEDICAL SERVICES
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

Client's signature ..... Date .....

CONSULTANTS:

DEPARTMENT OF PUBLIC WORKS,
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

Architect's signature ..... Date .....

PROJECT:

PROPOSED MOTHER AND CHILD WELLNESS CENTRE.

Title:

FLOOR PLANS LAYOUT

DRAWN	C.K
CHECKED	K.M
APPROVED	G.K
Scale	As shown
Date	APRIL. 2021
PRJ. NO	A/10
DRW. NO	01

N

DR. JOYCE LABOSO MEMORIAL MOTHER & CHILD WELLNESS CENTRE.

NOTES

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REVISIONS

no.	date	description

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Client's signature ..... Date .....

CONSULTANTS:

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P.O BOX 19-20400
BOMET.

Architect's signature ..... Date .....

PROJECT:

PROPOSED MOTHER AND CHILD WELLNESS CENTRE.

Title:

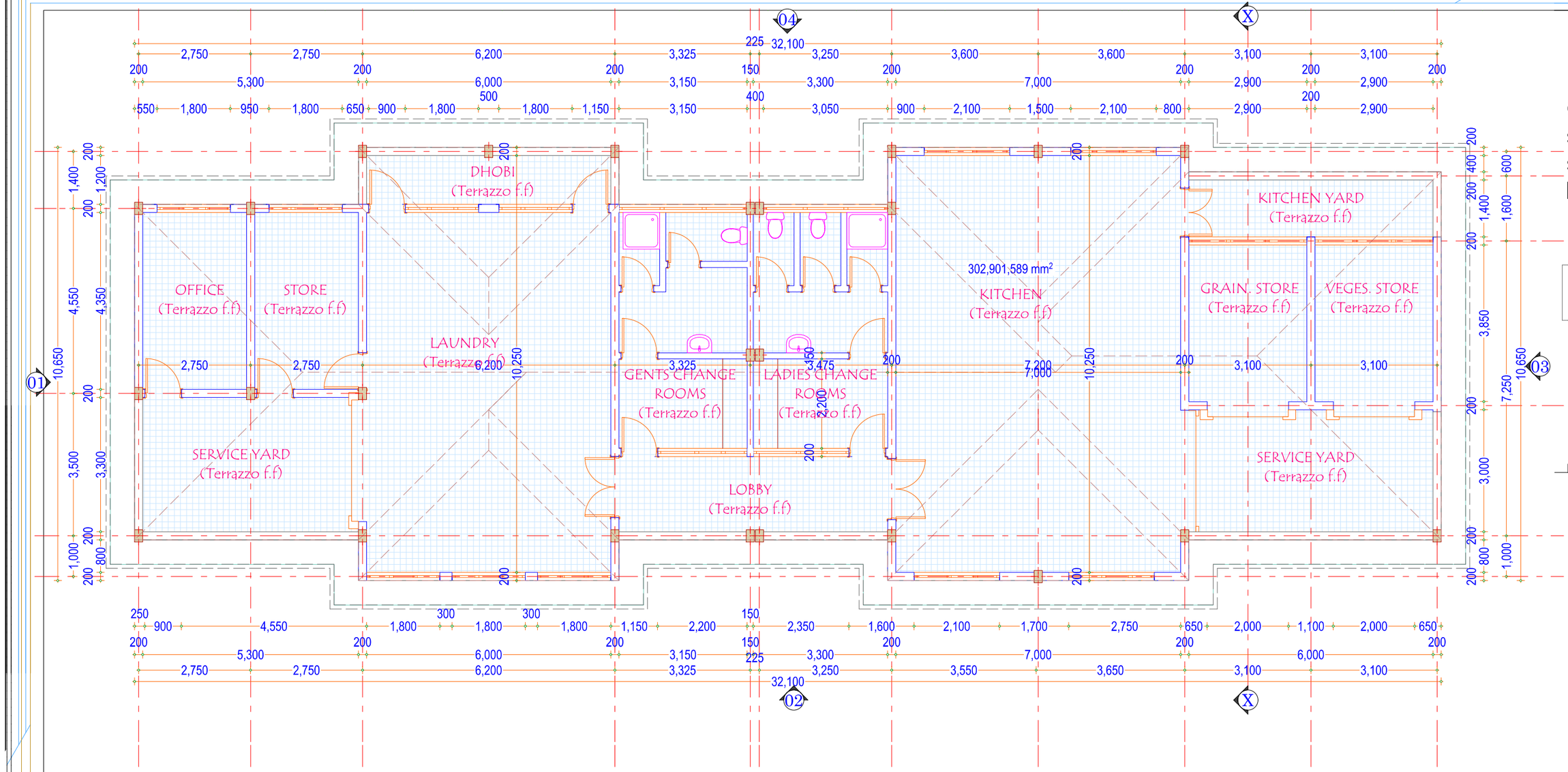
FLOOR PLANS LAYOUT

DRAWN	C.K
CHECKED	K.M
APPROVED	G.K
Scale	As shown
Date	APRIL. 2021

N

PRJ. NO A/10 DRW. NO 01

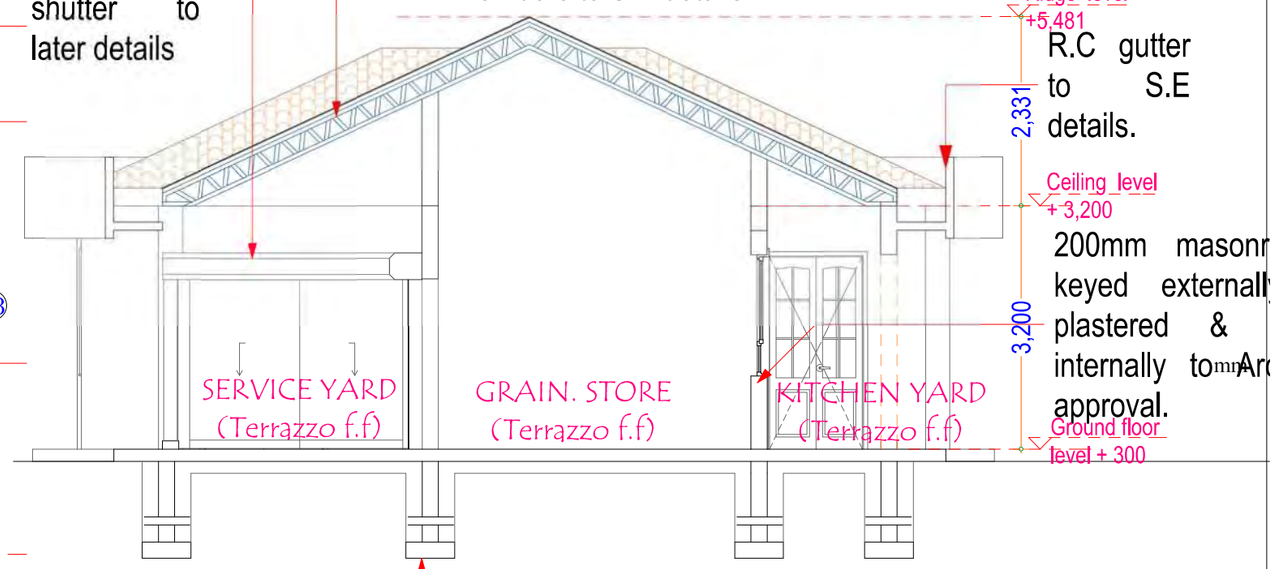
DR. JOYCE LABOSO MEMORIAL MOTHER & CHILD WELLNESS CENTRE.



GROUND FLOOR PLAN LAYOUT
SCALE 1:100

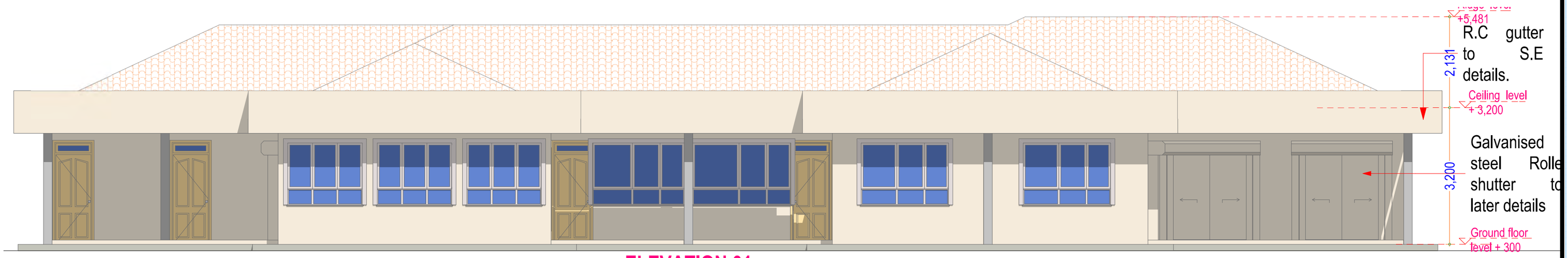
Galvanised steel Rolle shutter to later details

ROOF NOTES:
- PITCH 25 degrees
- IT5 roofing sheets on steel members to S.E details.

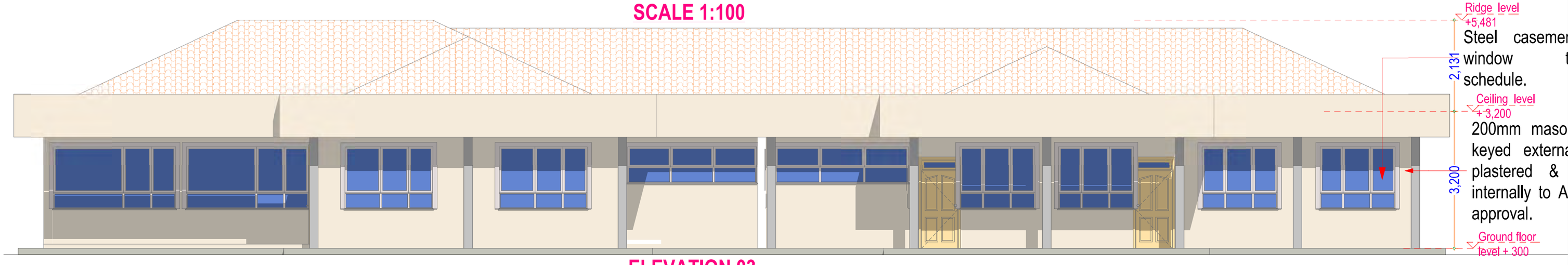


FOUNDATION NOTES
100mm thick concrete floor slab on
50mm thick murrum binding on minimum
450mm thick well compacted hardcore filing
600x200mm mass concrete strip foundation 1:2:4 mix

SECTION X-X
SCALE 1:100



ELEVATION 01
SCALE 1:100



ELEVATION 03
SCALE 1:100

DR. JOYCE LABOSO MEMORIAL MOTHER & CHILD WELLNESS CENTRE.

CLIENT:
DEPARTMENT OF PUBLIC HEALTH AND MEDICAL SERVICES
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

Client's signature | Date

CONSULTANTS:
DEPARTMENT OF PUBLIC WORKS,
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

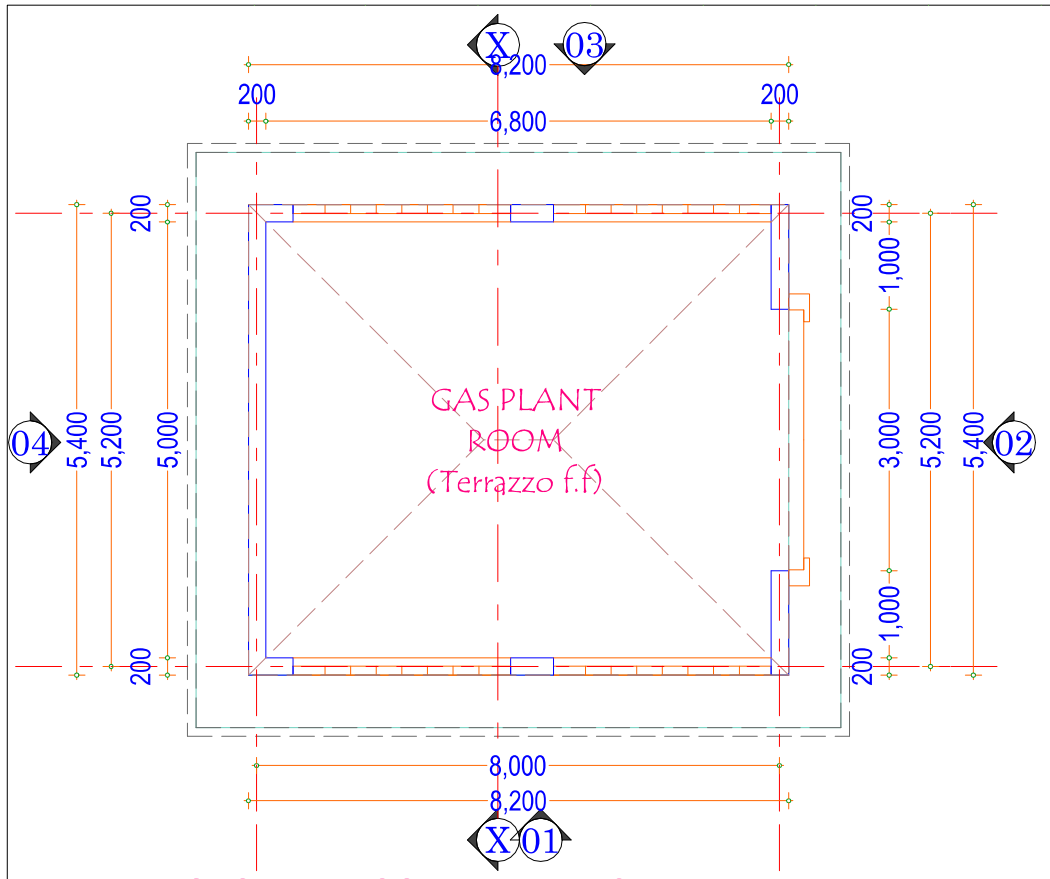
Architect's signature | Date

PROJECT:
PROPOSED KITCHEN AND LAUNDRY-M.C.H

Title:
FLOOR PLANS LAYOUT

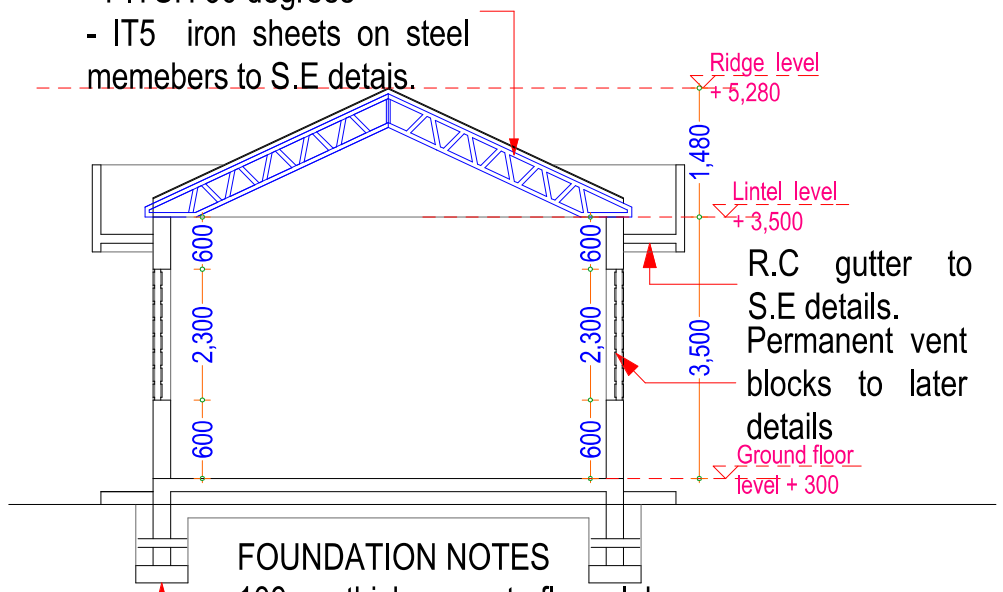
DRAWN	C.K
CHECKED	K.M
APPROVED	G.K
Scale	As shown
Date	APRIL. 2021
PRJ. NO	A/10
DRW. NO	01

N



GROUND FLOOR PLAN LAYOUT
SCALE 1:100

ROOF NOTES:
- PITCH 30 degrees
- IT5 iron sheets on steel memebers to S.E detais.

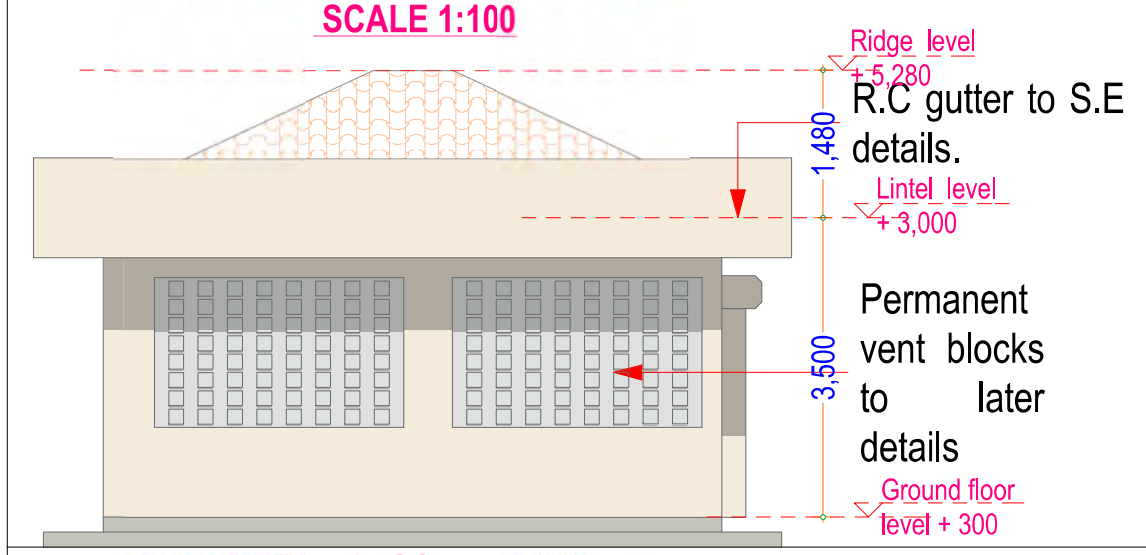


R.C gutter to S.E details.

Permanent vent blocks to later details

FOUNDATION NOTES
100mm thick concrete floor slab on
50mm thick murrum binding on minimum
450mm thick well compacted hardcore filing
600x200mm mass concrete strip foundation 1:2:4 mix

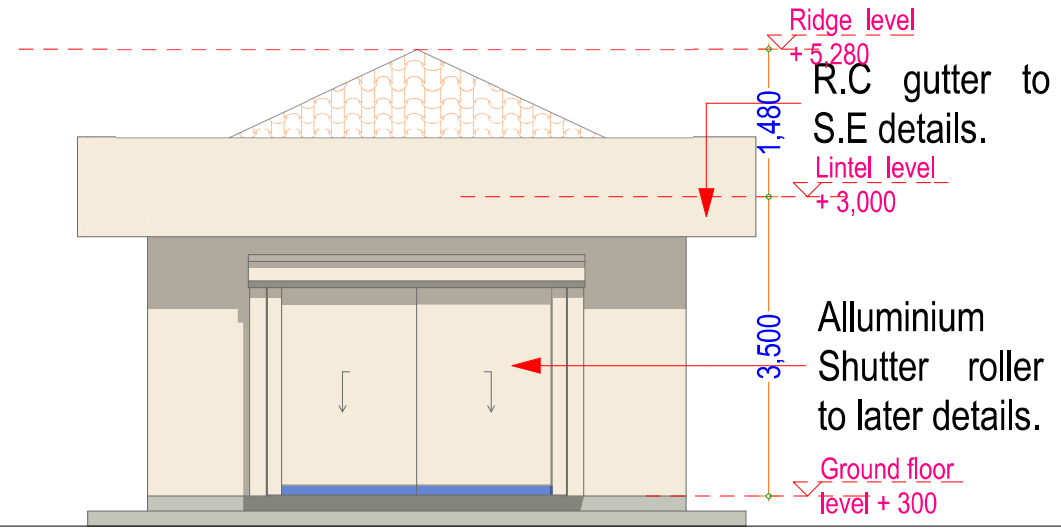
SECTION X-X SCALE 1:100



R.C gutter to S.E details.

Permanent vent blocks to later details

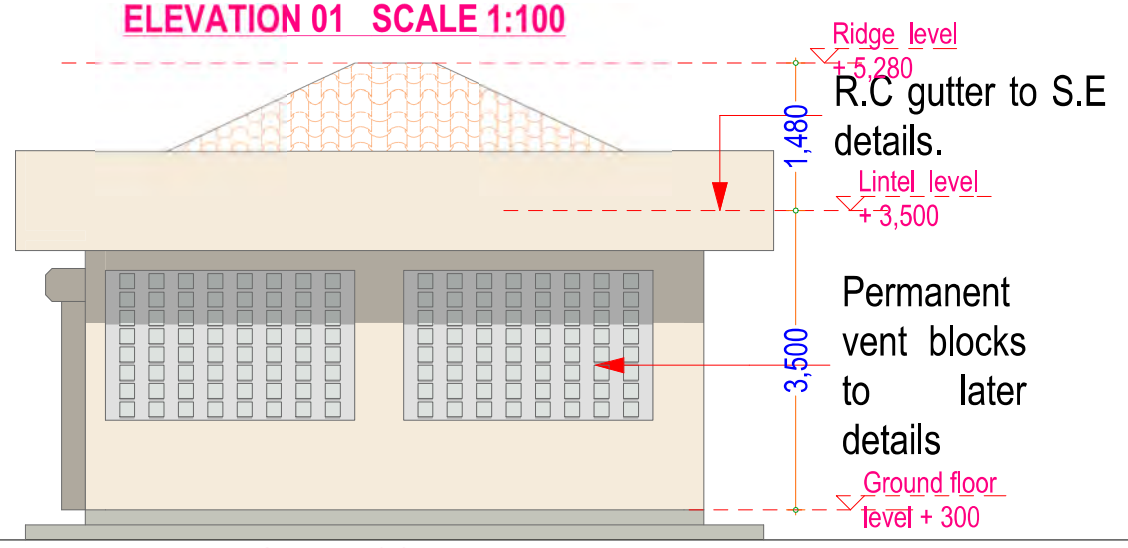
ELEVATION 01 SCALE 1:100



R.C gutter to S.E details.

Alluminium Shutter roller to later details.

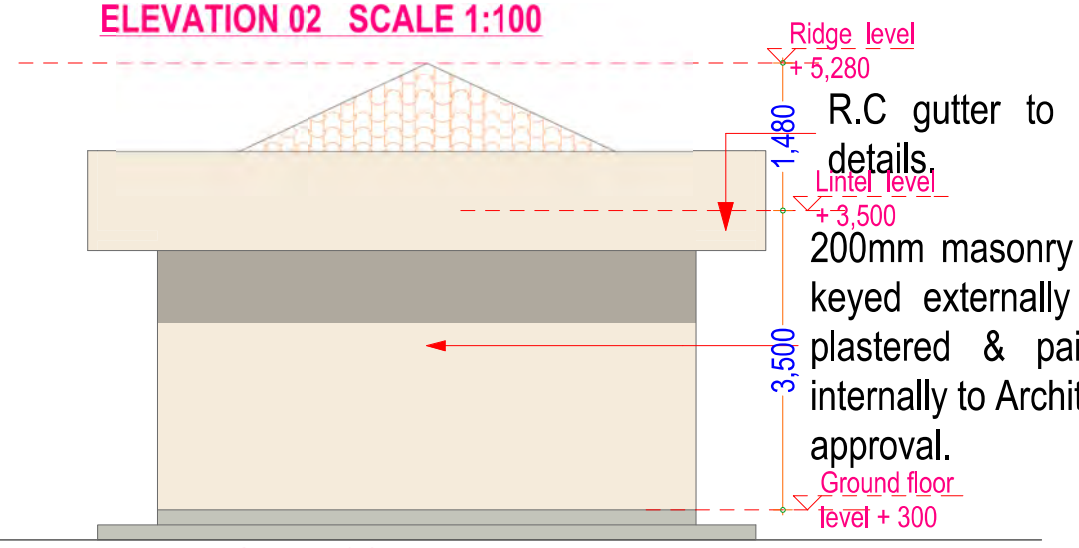
ELEVATION 02 SCALE 1:100



R.C gutter to S.E details.

Permanent vent blocks to later details

ELEVATION 03 SCALE 1:100



R.C gutter to S.E details.

200mm masonry wall keyed externally and plastered & painted internally to Architects approval.

ELEVATION 04 SCALE 1:100

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REVISIONS

no.	date	description

DR. JOYCE LABOSO MEMORIAL MOTHER & CHILD WELLNESS CENTRE.

CLIENT:
DEPARTMENT OF PUBLIC HEALTH AND MEDICAL SERVICES
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

Client's signature | Date

CONSULTANTS:
DEPARTMENT OF PUBLIC WORKS,
COUNTY GOVERMENT OF BOMET.
P.O BOX 19-20400
BOMET.

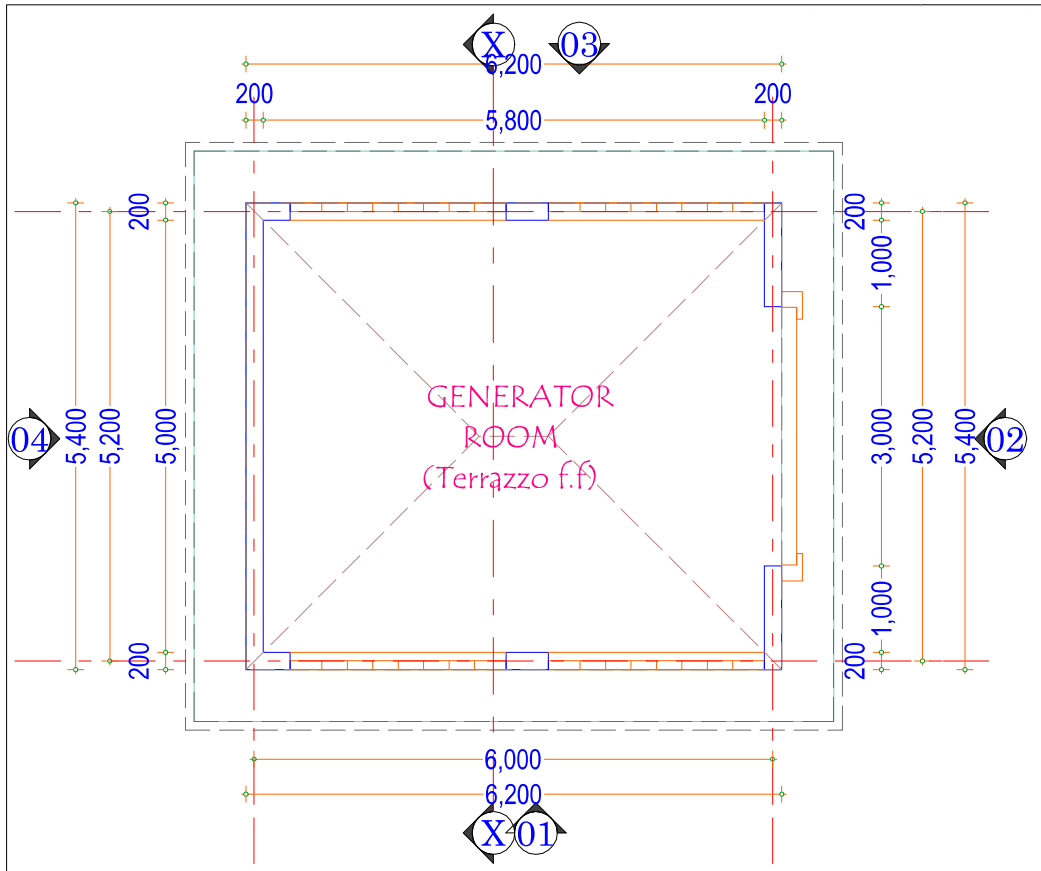
Architect's signature | Date

PROJECT:
PROPOSED GAS PLANT
-M.C.H

Title:
FLOOR PLANS LAYOUT

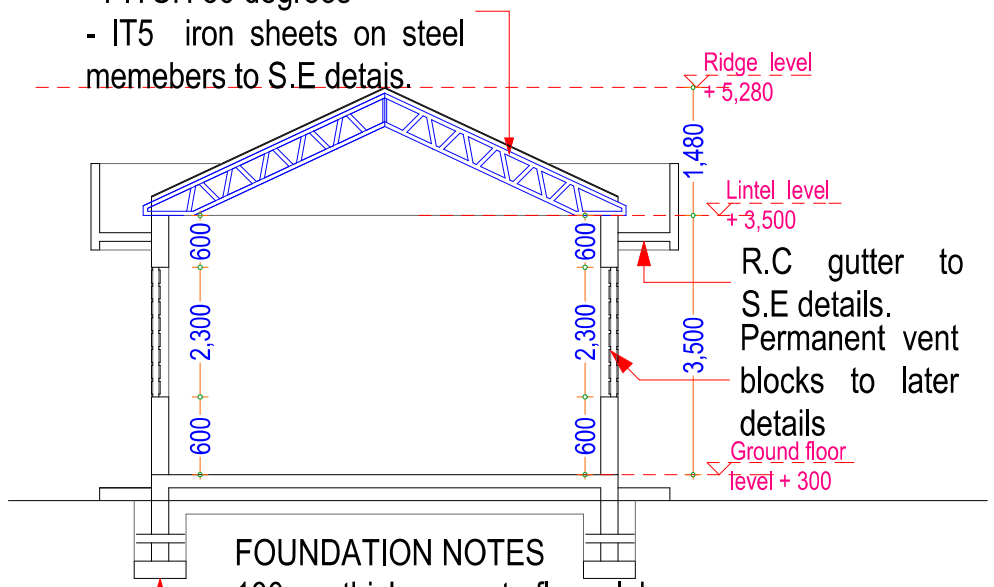
DRAWN	C.K
CHECKED	K.M
APPROVED	G.K
Scale	As shown
Date	APRIL. 2021
PRJ. NO	A/10
DRW. NO	01

N



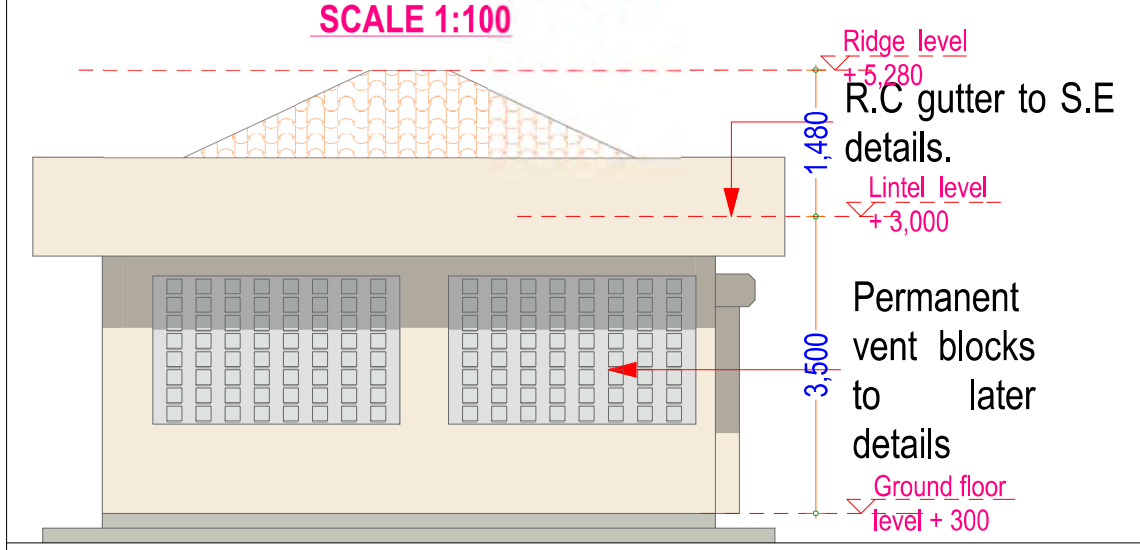
GROUND FLOOR PLAN LAYOUT
SCALE 1:100

ROOF NOTES:
- PITCH 30 degrees
- IT5 iron sheets on steel memebers to S.E detais.

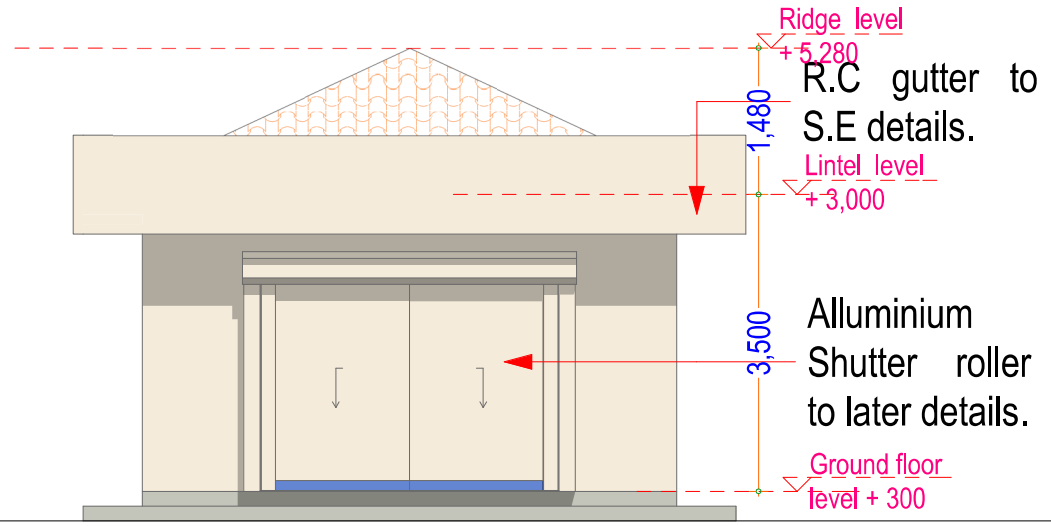


FOUNDATION NOTES
100mm thick concrete floor slab on
50mm thick murrum binding on minimum
450mm thick well compacted hardcore filing
600x200mm mass concrete strip foundation 1:2:4 mix

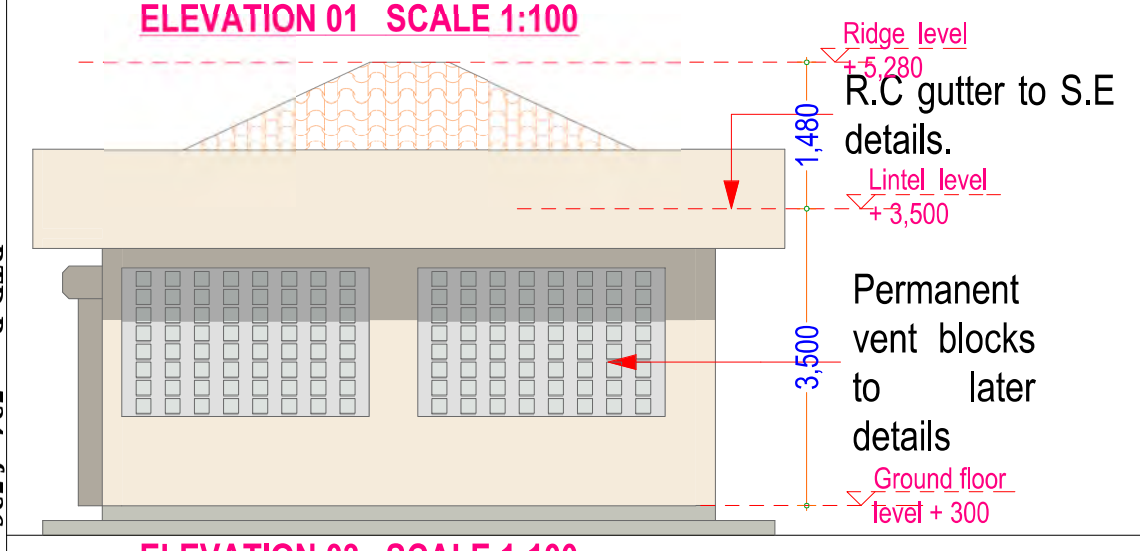
SECTION X-X SCALE 1:100



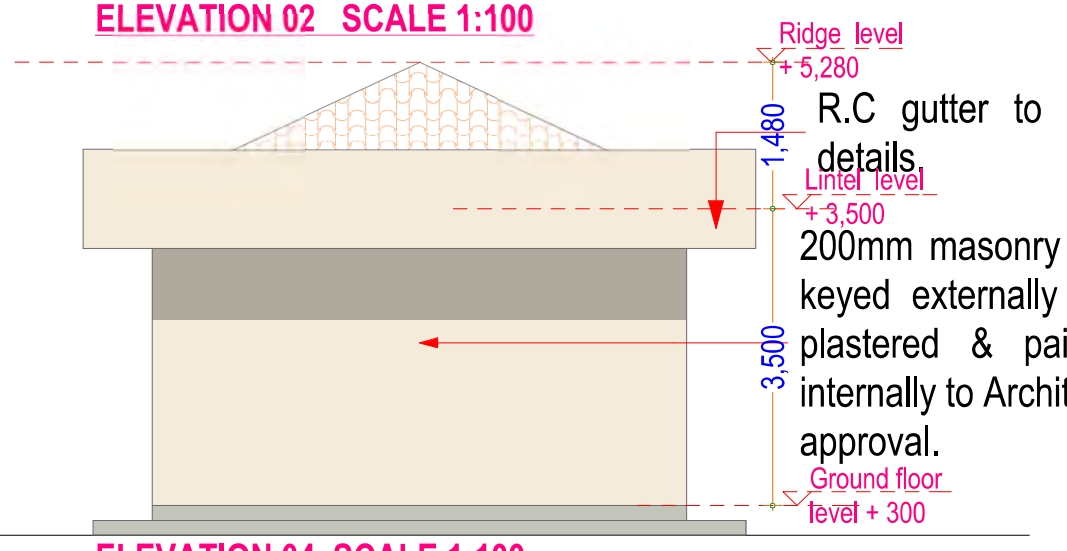
ELEVATION 01 SCALE 1:100



ELEVATION 02 SCALE 1:100



ELEVATION 03 SCALE 1:100



ELEVATION 04 SCALE 1:100

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COUNTY GOVERMENT OF BOMET.
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Architect's signature | Date

PROJECT:
PROPOSED GENERATOR ROOM -M.C.H

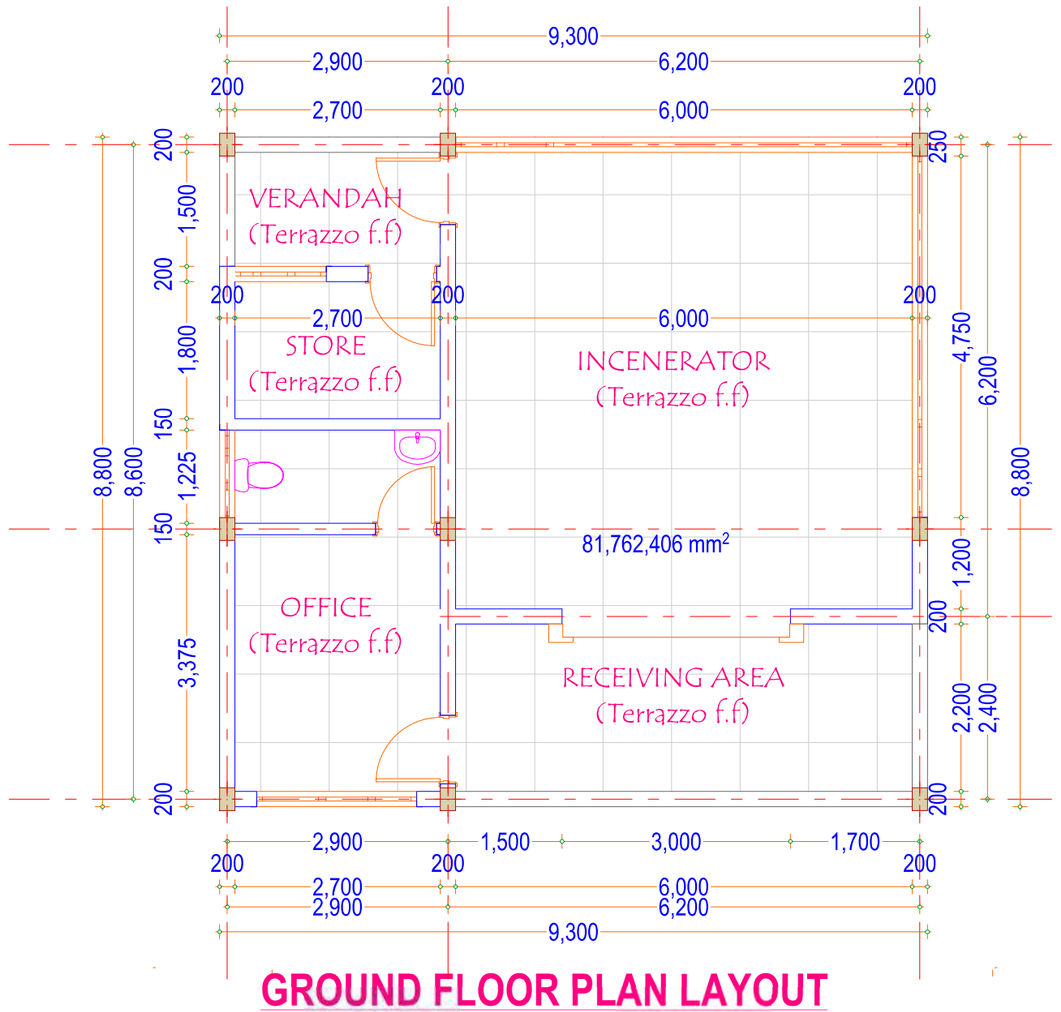
Title:
FLOOR PLANS LAYOUT

DRAWN	C.K
CHECKED	K.M
APPROVED	G.K
Scale	As shown
Date	APRIL. 2021

N

PRJ. NO A/10 DRW. NO 01

DR. JOYCE LABOSO MEMORIAL MOTHER & CHILD WELFARE CENTRE.



GROUND FLOOR PLAN LAYOUT
SCALE 1:100

ROOF NOTES:
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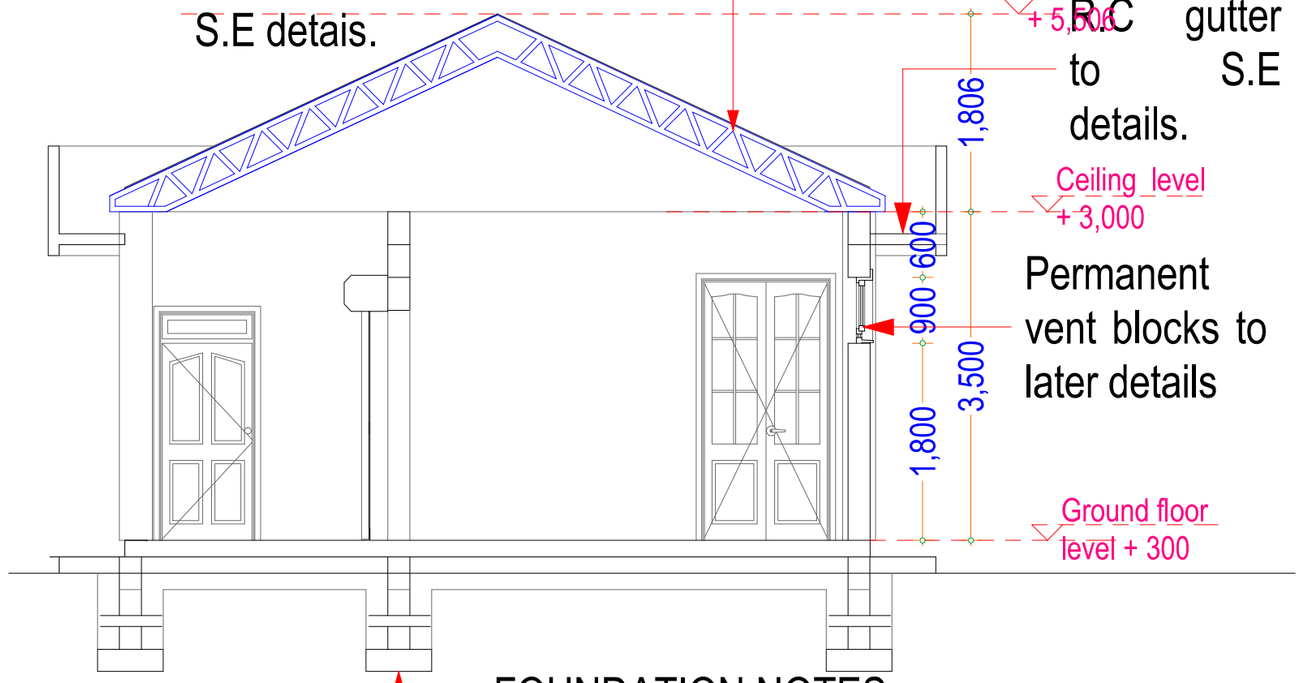
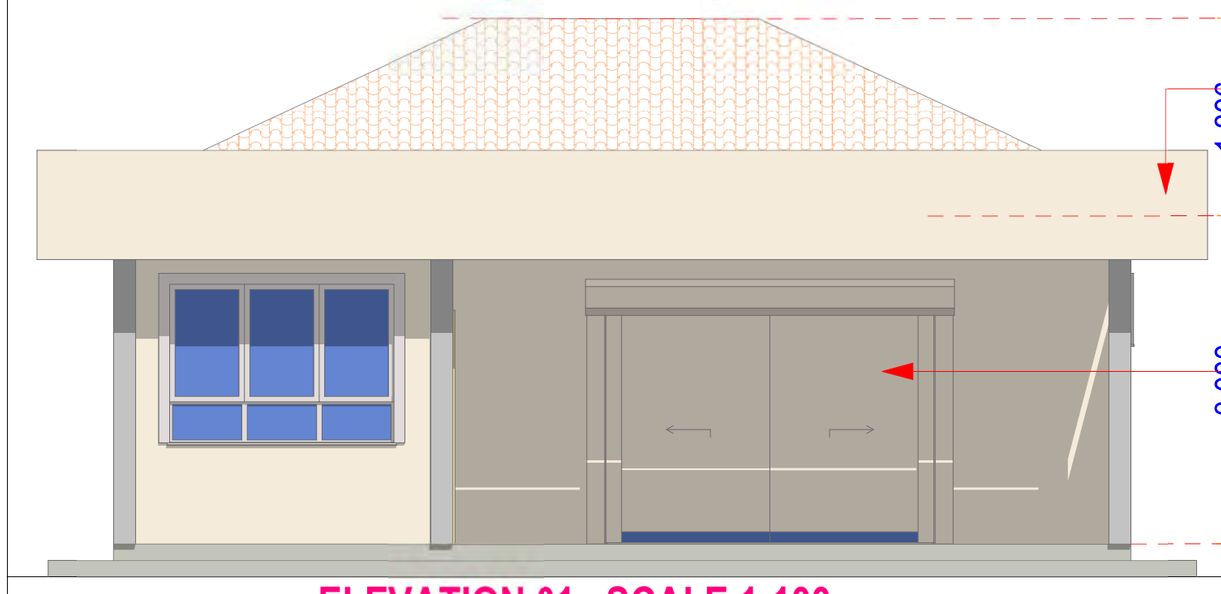
- IT5 iron sheets on steel members to S.E detais.

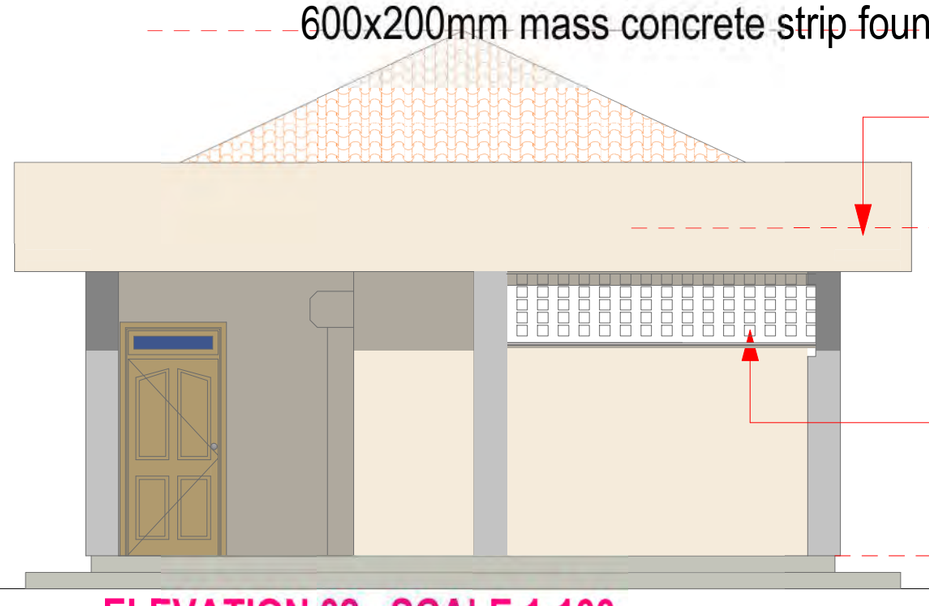


SECTION X-X SCALE 1:100

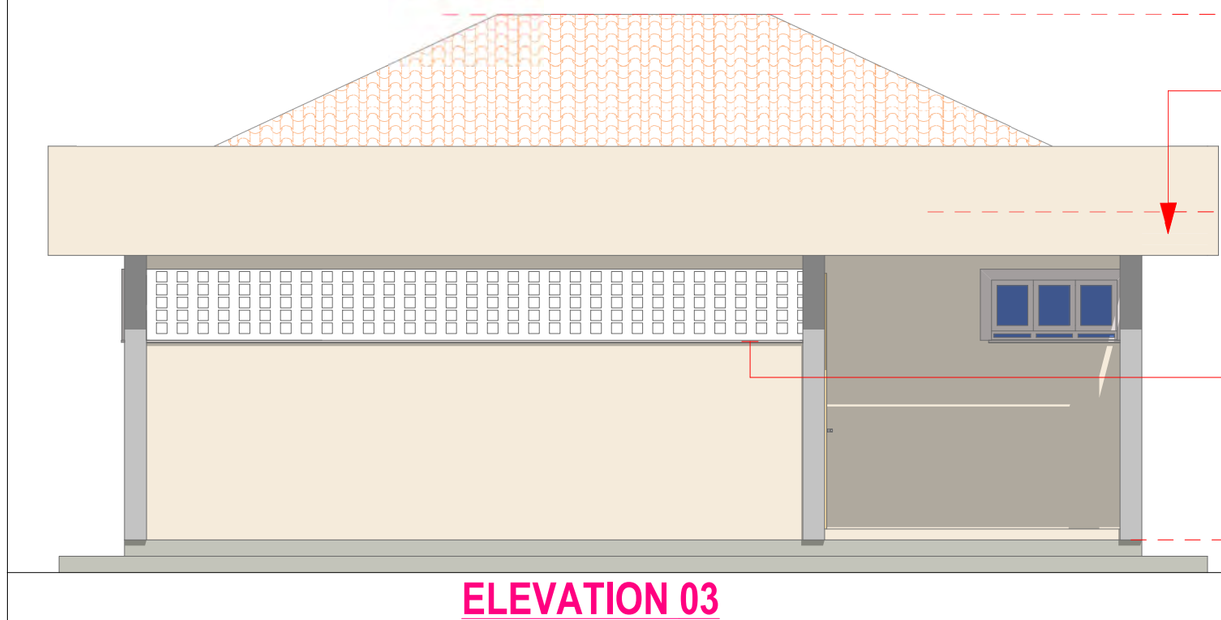
FOUNDATION NOTES
100mm thick concrete floor slab on
50mm thick murrum binding on minimum
450mm thick well compacted hardcore filing
600x200mm mass concrete strip foundation 1:2:



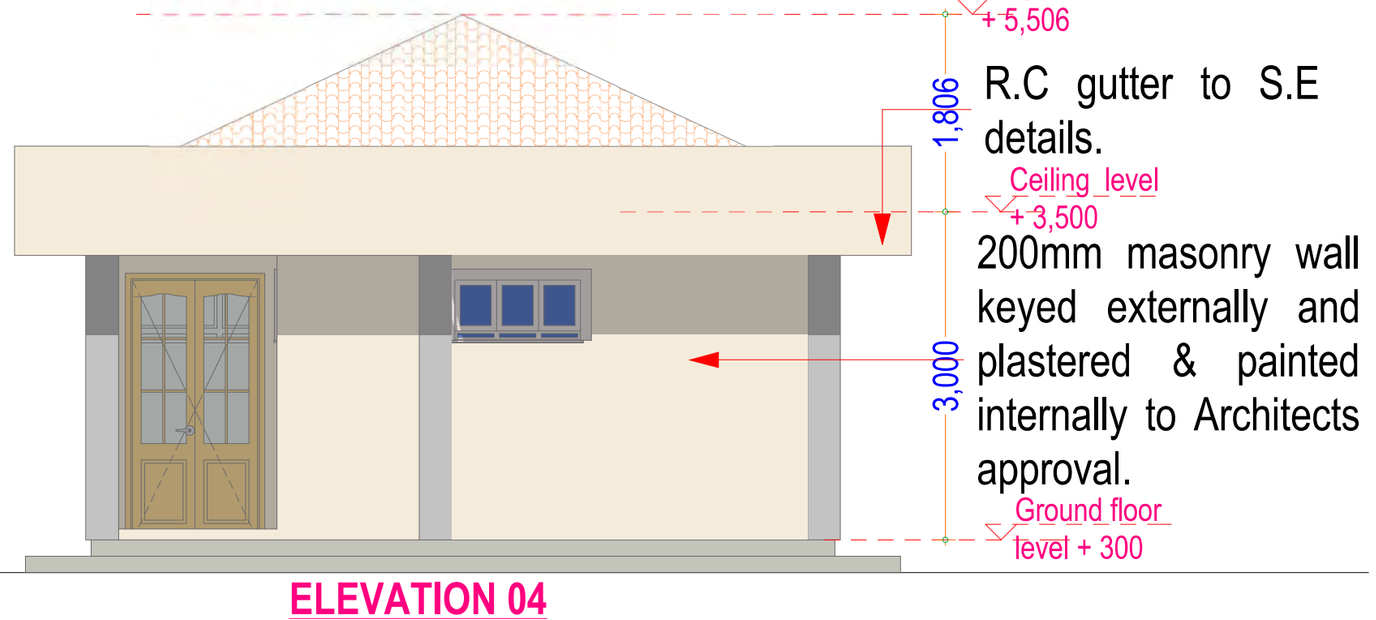
ELEVATION 01 SCALE 1:100



ELEVATION 02 SCALE 1:100



ELEVATION 03
SCALE 1:100



ELEVATION 04
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Architect's signature | Date

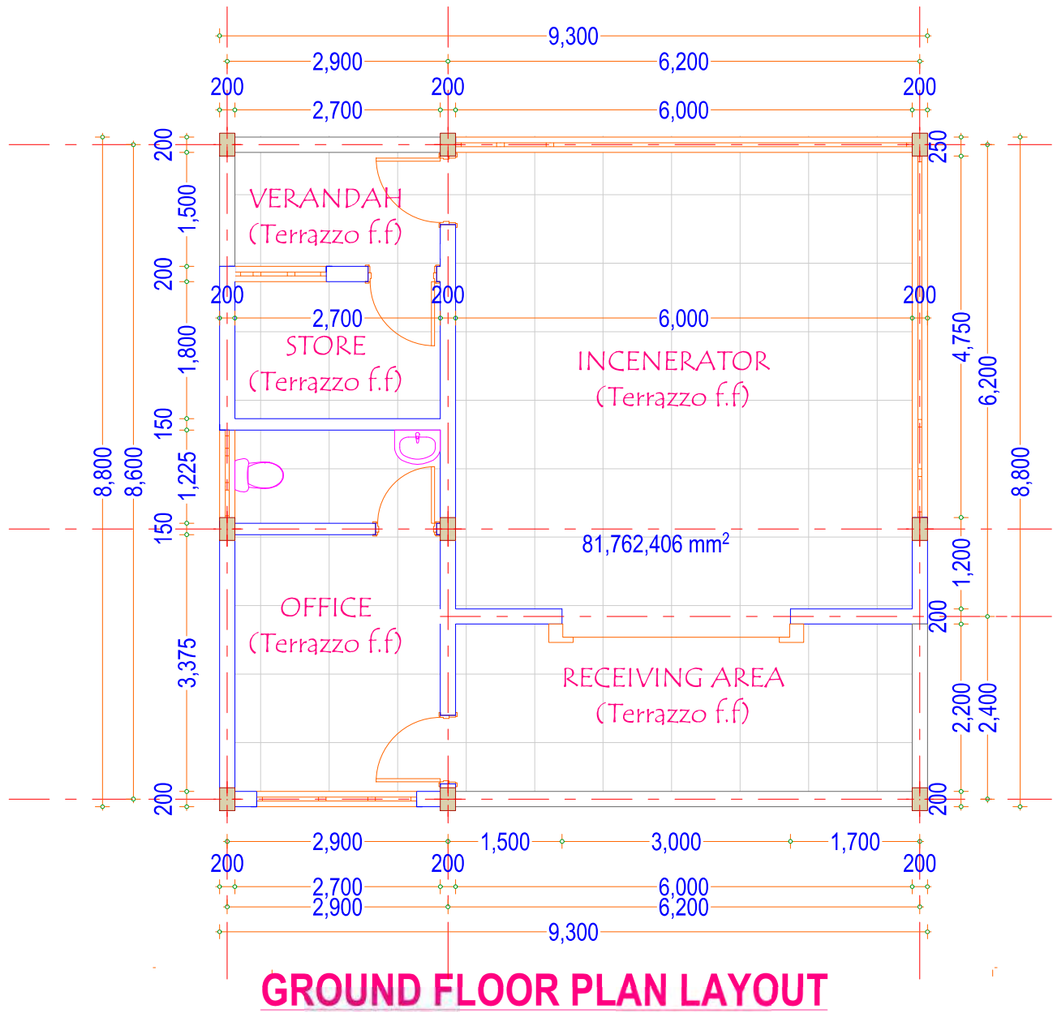
PROJECT:
PROPOSED INCENERATOR ROOM -M.C.H

Title:
FLOOR PLANS LAYOUT

DRAWN	C.K
CHECKED	K.M
APPROVED	G.K
Scale	As shown
Date	APRIL. 2021
PRJ. NO	A/10
DRW. NO	01

N

DR. JOYCE LABOSO MEMORIAL MOTHER & CHILD WELLNESS CENTRE.



GROUND FLOOR PLAN LAYOUT
SCALE 1:100

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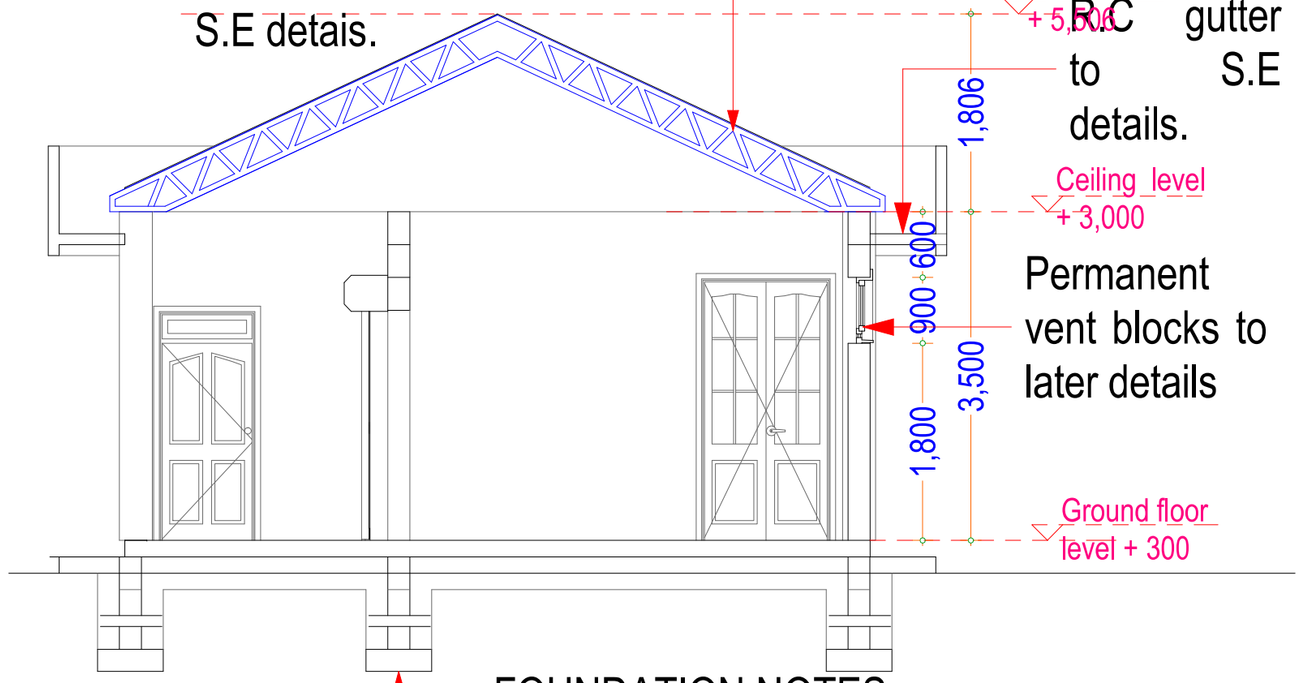

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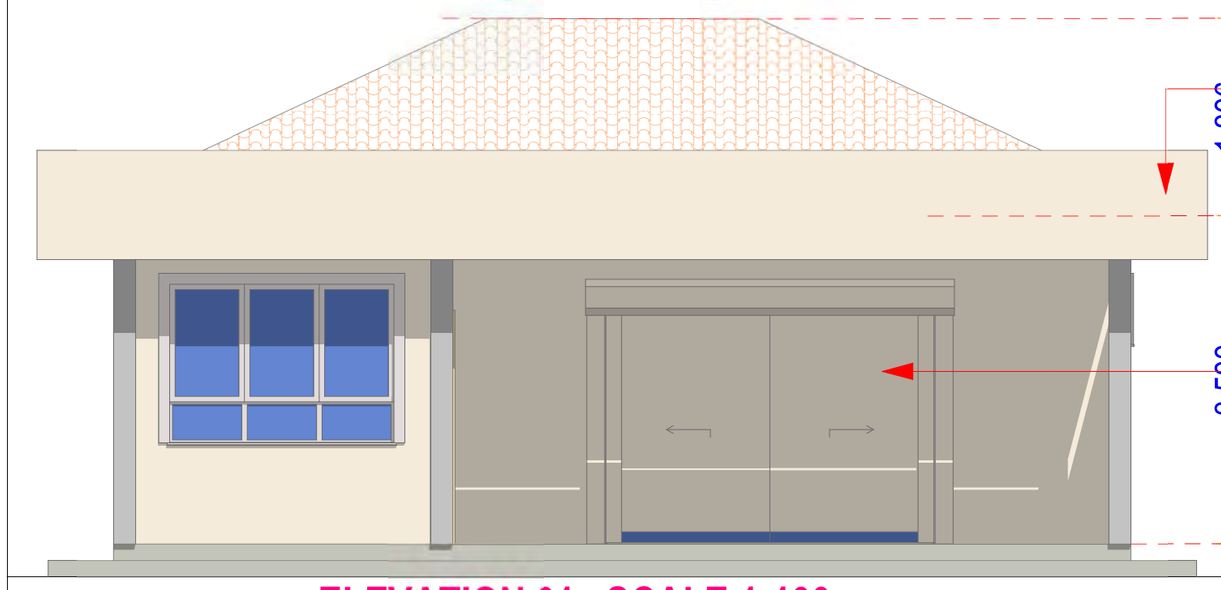

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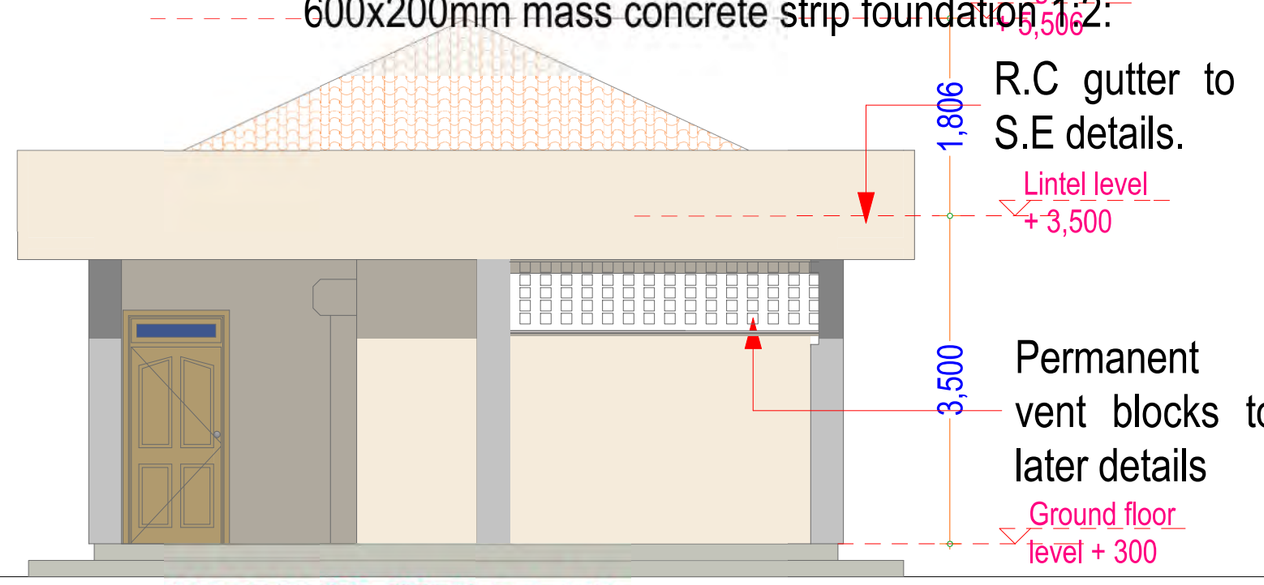
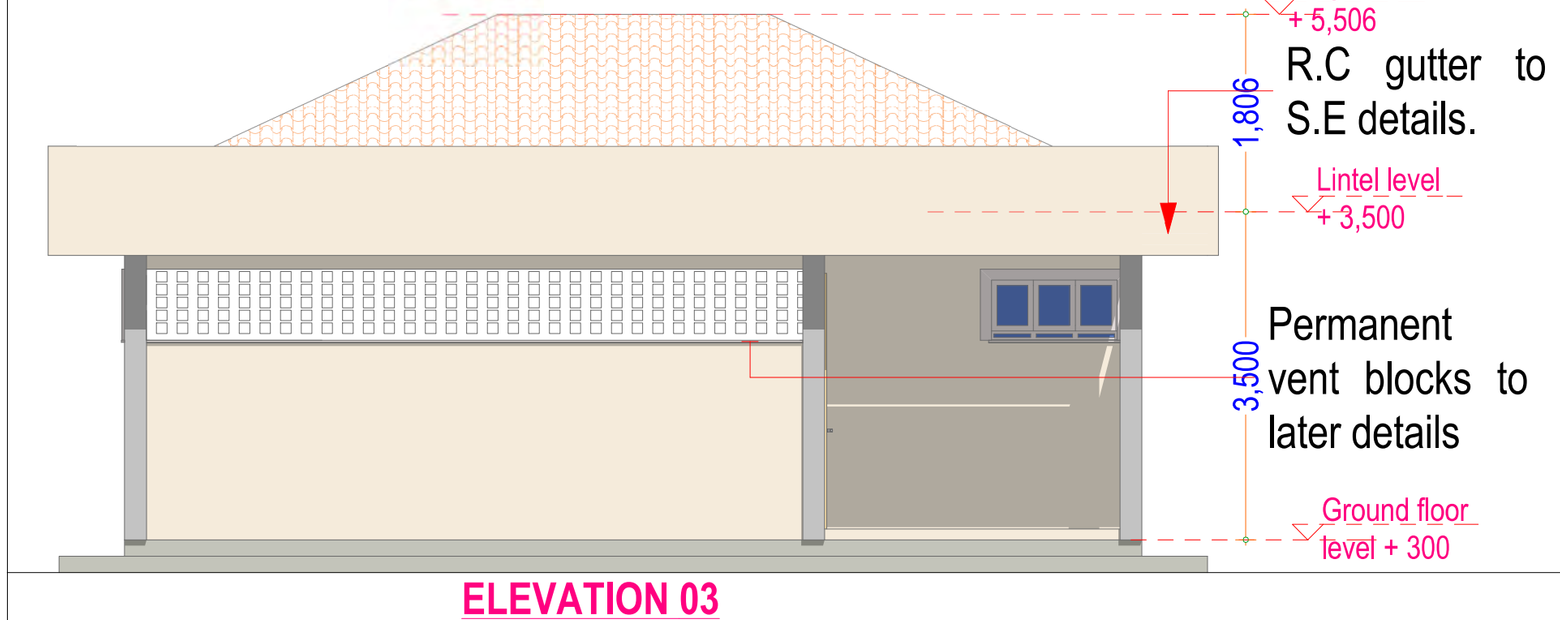
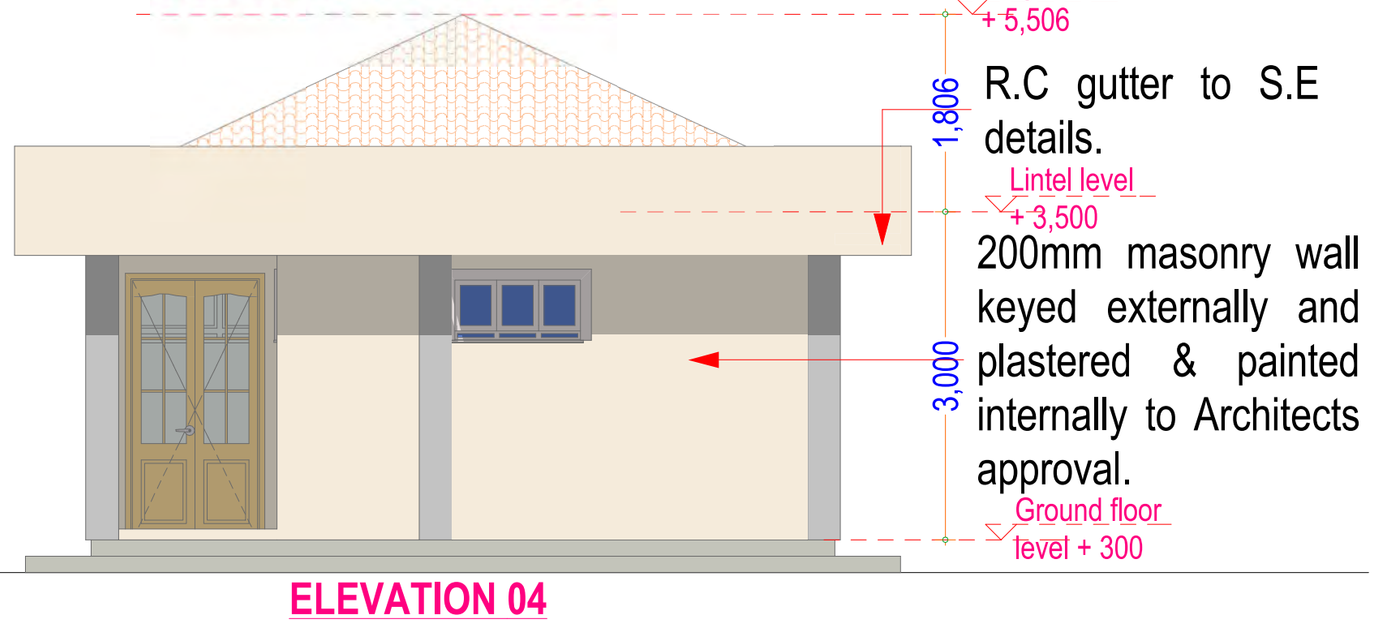


ELEVATION 02 SCALE 1:100



ELEVATION 03
SCALE 1:100



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Title:
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Scale	As shown
Date	APRIL. 2021
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