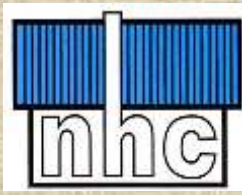


NATIONAL HOUSING CORPORATION



PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT PHASE ONE SECTOR A HOMABAY COUNTY

- PART 'A' - FINANCIAL PROPOSAL/FORM OF
TENDER AND AGREEMENT
- PART 'B' - INSTRUCTIONS TO TENDERERS
AND CONDITIONS OF CONTRACT
- PART 'C' - BILLS OF QUANTITIES

NHC / H - AHP / 007 / 2022 - 2023

PARTNERS

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EMPLOYER/PROJECT MANAGER

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2. COUNTY GOVERNMENT OF HOMABAY,
P.O. BOX 469-40300 ,
HOMABAY.

OCTOBER 2022

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INVITATION TO TENDER

TENDER No: TENDER NO. NHC / H-AHP/007/2022-2023

TENDER NAME: PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT PHASE ONE-SECTOR A. HOMABAY COUNTY

1. The **National Housing Corporation** invites sealed tender for the Proposed Construction of Homabay Affordable Housing Project -Sector A. Homabay County
2. Tendering will be conducted under open competitive method **National** using a standardized tender document. Tendering is open to **Contractors Registered in the appropriate Category for Builders Works NCA 1**
3. Qualified and interested bidders may obtain further information and inspect the Tender Documents during office hours between **0800hrs-0400hrs** at the address given below.
4. A complete set of tender documents may be obtained by interested tenderers at tender's address given below. Tender documents may be obtained electronically from the Website www.nhckkenya.go.ke
5. Tender documents may be viewed and downloaded for free from the website www.nhckkenya.go.ke Tenderers who download the tender document **must** forward their particulars immediately to *Managing Director, National Housing Corporation* to facilitate any further clarification or addendum.
6. Tenders shall be quoted in Kenya Shillings and shall include all taxes. Tenders shall remain valid for **120** days from the date of opening of tenders.
7. Bidders should attach a dully filled, signed and stamped Tender securing declaration form.
8. The Tenderer shall chronologically serialize all pages of the tender documents submitted. Tender Document must be tape bound and not Spiral bound. Spiral bound documents shall be automatically disqualified. In addition, bidders **MUST** submit a soft copy in PDF format during bid opening which is a replica of the Original bid document.
9. Completed tenders must be delivered to the address below on or before **4TH November at 11:00am**. Electronic Tenders will **not** be permitted.
10. Tenders will be opened immediately after the deadline date and time specified above or any deadline 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.
11. Late tenders will be rejected.
12. The addresses referred to above are

A. Address for obtaining further information

Managing Director
National Housing Corporation
Agha Khan Walk, Nairobi
P.O.Box 30257 00100
Nairobi
procurement@nhckkenya.go.ke

B. Address for Submission of Tenders.

Managing Director
National Housing Corporation
Agha Khan Walk, Nairobi
P.O.Box 30257 00100
Nairobi
NHC Building Ground Floor
info@nhckenya.go.ke

C. Address for Opening of Tenders.

Managing Director
National Housing Corporation
Agha Khan Walk, Nairobi
P.O.Box 30257 00100
Nairobi
NHC Building 10th Floor
info@nhckenya.go.ke

Head of Procurement

For: Ag. Managing Director

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. At 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

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 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 anonymized (*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 19 establishing the Tenderer's qualification 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 then 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 be priced 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 ITT16;
- 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 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 twenty-one (21) 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 areas 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 HOMABAY AFFORDABLE HOUSING PROJECT PHASE ONE SECTOR A. HOMABAY COUNTY . The reference number of the Contract is: TENDER NO. NHC/H-AHP/007/2022-2023
	B. Contents of Tender Document
ITT 8.2	The Tenderer will submit any questions in writing, to reach the Procuring Entity 7 days before the date of tender opening.
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: National Housing Corporation (2) Physical address for hand Courier Delivery to an office: NHC House Harambee Avenue off Aga Khan Walk , Ground floor P.o Box 30257 00100 Nairobi officer to be contacted: Head, Procurement Email: info@nhckenya.go.ke
	C. Preparation of Tenders
ITT 15.1	Alternative Tenders <i>shall not be</i> considered.
ITT 15.2	Alternative times for completion <i>shall not be</i> permitted.
ITT 20.1	The Tender validity period shall be 180 days.
ITT 21.1	Bidders should attach a dully filled, signed and stamped Tender securing declaration form.
ITT 22.1	In addition to the original of the Tender, the number of copies is: One Soft copy in PDF
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	<p>(A) For <u>Tender submission purposes</u> only, the Procuring Entity's address is:</p> <p>(1) Name of Procuring Entity: National Housing Corporation</p> <p>(2) Postal Address Ag. Managing Director, National Housing Corporation P.o Box 30257 00100 Nairobi</p> <p>(3) Physical address for hand Courier Delivery to an office or Tender Box NHC House Harambee Avenue off Aga Khan Walk , Ground floor Tender Box P.o Box 30257 00100 Nairobi</p> <p>(4) Date and time for submission of Tenders: 4th November, 2022 at 11.00 a.m.</p>
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ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
	(5) Tenderers shall not submit tenders electronically.
ITT 27.1	<p>The Tender opening shall take place at the time and the address for Opening of Tenders provided below:</p> <p>Name of Procuring Entity: National Housing Corporation</p> <p>Physical address for the location NHC House 10th Floor Board Room</p> <p>(3) State date and time of tender opening 4th November, 2022 at 11.00 a.m</p>
ITT 27.6	The number of representatives of the Procuring Entity to sign is: as guided by the Public Procurement and Asset Disposal Act, 2015 and attendant Regulations.
E. Evaluation, and Comparison of Tenders	
ITT 32.3	The adjustment shall be based on the <i>highest</i> 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.
ITT35.2	A margin of preference shall not apply.
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 Nairobi Centre for International Arbitration at an hourly fee to be determined guided by fees guidelines.
ITT 52.2	Other documents required are : None
ITT 54.1	<p>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:</p> <p>For the attention: Director General Title/position: Director General</p> <p>Procuring Entity: Public Procurement Regulatory Authority</p> <p>Email address: complaints@ppra.go.ke.</p> <p>In summary, a Procurement-related Complaint may challenge any of the following:</p> <p>(i) the terms of the Tender Documents; and</p> <p>(ii) the Procuring Entity’s decision to award the contract.</p>

SECTION III - EVALUATION AND QUALIFICATION CRITERIA

1. General Provisions

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.

The following mandatory requirements shall be used for determination of Responsiveness at the preliminary evaluation

1. Registration/Incorporation Certificate
2. Valid Tax Compliance Certificate
3. CR12 valid for last 12months
4. Bid security from a reputable tier One Commercial bank of Kshs. 5,000,000.00
5. National Construction Authority (NCA) Registration category 1 for Building Works
6. Current annual practicing license from the NCA
7. Audited accounts for each of the last three years (i.e. 2018,2019-2020)
8. Dully Filled, signed and stamped form of Tender and Tender securing declaration form
9. Bidders shall chronologically and sequentially serialize their bid document from cover page including all attachments in numerical format. Tender Document must be tape bound and not Spiral bound. Spiral bound documents shall be automatically disqualified. In addition, bidders **MUST** submit a soft copy in PDF format during bid opening which is a replica of the original biddocument.
10. Dully Filled, signed and stamped Business Questionnaire
11. Completeness of the tender document as instructed in the Instruction to Tender

3. Margin of Preference is not applicable

4. 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 **Sixty million Kenya Shillings (Kshs60,000,000)**

- ii) At least **three (3)** of contract(s) of a similar nature executed within Kenya, or the East African Community or abroad, that have been satisfactorily and substantially completed as a prime contractor, or joint venture member or sub-contractor each of minimum value **Kenya shillings Five Hundred Million (Kshs.500,000,000) equivalent for the last Ten (10) years.**

- iii) Contractor's Representative and Key Personnel, which are specified as:

No.	Position	Total Work Experience (years)	Experience In Similar Works (years)
1	Project Manager (Bachelor of Architecture OR Bachelor of Quantity Surveying OR Civil Engineering OR BSc. Construction Management, all registered with relevant professional bodies)	10	5
2	Site Agent (Bachelor of Architecture OR Bachelor of Quantity Surveying OR BSc. Construction Management OR Civil Engineering all registered with relevant professional bodies)	10	5
3	General Foreman (Diploma in Building Construction OR Construction Management OR Civil Engineering)	10	5

- iv) Contractors' key equipment listed on the table "Contractor's Equipment" below and morespecifically listed as:

No.	Equipment Type and Characteristics	Minimum Number required
1	Concrete Mixer Type 5/3.5	2
2	Concrete dumper 0.5 cu.m	2
3	Concrete vibrator poker type N.D. 50 mm	2
4	Tipper Truck 15 ton.	2
5	Plate Compacter	1
6	10 Tone Roller	

- v) Further Evaluation shall be conducted after Preliminary examination for Determination of Responsiveness. The said further evaluation shall comprise of the detailed technical examination and technical evaluation.
- vi) Finally, tenders attaining the minimum score of **70 points** in detailed technical evaluation shall be subjected to financial evaluation and comparison to determine the lowest evaluated price of the tender

Detailed Technical Examination

Award of points for the **Technical Evaluation** will be as follows: -

No	Parameter	Maximum Points
1	Key personnel	20
2	General Experience	10
3	Specific Construction Experience	15
4	Schedules of contractor's equipment	15
5	Audited Financial Report for the for the last 3 years	15
6	Evidence of Financial Resources	10
7	Detailed works program and methodology	15
Total		100

Item	Description	Points Scored	Max. Points
1	Key Personnel as detailed under clause 4 b (iv) of the Evaluation Criteria NB: Attach Curriculum Vitae and certificates		
	Project Manager for the firm <ul style="list-style-type: none"> With relevant qualification and over 10 years general experience in similar works(8 marks) With relevant qualification and experience below 10 years (4 marks) With no relevant experience 		8
	Site Agent with the relevant Qualifications <ul style="list-style-type: none"> With relevant qualification and over 10 years general experience in similar works (7 marks) With relevant qualification and experience below 10 years the requirements(3 marks) With no relevant experience 		7
	General Foreman/Site Surveyor <ul style="list-style-type: none"> With relevant qualifications and experience for 10 years (5 marks) With relevant qualifications and experience for less than 10 years (2marks) With no relevant experience 		5
2.	General Experience		
	<ul style="list-style-type: none"> Has been practicing as a Contractor for the last 10 years.(10 marks) Experience as Contractor below 10 years(5marks) No Experience as a Contractor 		10

3.	Specific Experience (a max of 3No. Projects for a period of 10 years) <ul style="list-style-type: none"> Project of similar nature, complexity and magnitude (15 marks) Project of similar nature but of lower value than the one in consideration. (10marks) Not undertaken/completed project of similar nature. 		15
4.	Schedules of contractor's equipment For each specific equipment required in the construction work being tendered for. (All the categories listed to be considered and 3 points will be awarded for meeting eachcategory)		15
5.	Financial report Audited financial report last Three [3] years (2018,2019, 2020) <ul style="list-style-type: none"> Certified Audited Financial report for the year 2018,2019 and 2020 by a licensed auditors (15 Marks) 		15
6.	Evidence of financial resources (cash in hand, lines of credit, over draft facility etc.) <ul style="list-style-type: none"> Evidence of a line of credits and or cash from a reputable bank (tire 1)(10 marks) Evidence of lines of credit from other financial institutions(5 marks) Has not demonstrated/given evidence for the financial resources(0 Marks) 		10
7.	Detailed works program outlining the methodology of implementing the project to completion including the defects liability period. <ul style="list-style-type: none"> Adequacy of the proposed Works program and methodology within 12months completion .(15 Marks) Beyond 12months of the project Completion(10 marks) No works program or methodology provided.(0 marks) 		15
	TOTAL POINTS		100
	MINIMUM POINTS		70

QUALIFICATION FORM SUMMARY

1	2	3	4	5
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 the Kenya Revenue Authority in accordance with ITT 3.14.	Form of Tender	
4	PPRA Eligibility	Not having been declared ineligible by the PPRA as described in ITT 3.8	Form of Tender	
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 2022	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 Sixty million K e n y a Shillings (Kshs60,000,000) equivalent for the subject contract(s) net of the Tenderer's	Form FIN – 3.1, with attachments	

1	2	3	4	5
Item No.	Qualification Subject	Qualification Requirement	Document To be Completed by Tenderer	For Procuring Entity's Use (Qualification met or Not Met)
		<p>other commitments.</p> <p>) The Tenderers shall also demonstrate, to the satisfaction of the Procuring Entity, that it has adequate sources of finance to meet the cash flow requirements on works currently in progress and for future contract commitments.</p> <p>) The audited balance sheets or, if not required by the laws of the Tenderer's country, other financial statements acceptable to the Procuring Entity, for the last Three years shall be submitted and must demonstrate the current soundness of the Tenderer's financial position and indicate its prospective long-term profitability.</p>		
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 Ten (10) years ,	Form EXP – 4.1	
	Specific Construction & Contract Management Experience	A minimum number of One (1) 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 2012 and tender submission deadline i.e. (number) contracts, each of minimum value Kenya shillings_ Five Hundred Million (Kshs.500,000,000) equivalent.	Form EXP 4.2(a)	

1	2	3	4	5
Item No.	Qualification Subject	Qualification Requirement	<i>Document To be Completed by Tenderer</i>	<i>For Procuring Entity's Use (Qualification met or Not Met)</i>
		The similarity of the contracts shall be based on the following: physical size, complexity, construction method, technology		

1. FORMEQU: EQUIPMENT

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

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

Omit the following information for equipment owned by the Tenderer.

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

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.

Contractor' Representative and Key Personnel

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

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

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

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

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

Declaration

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

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

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

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

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

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

Signature: _____

Date: (day month year): _____ Countersignature

of authorized representative of the Tenderer:

Signature: _____ Date: (day month

year): _____

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: <i>[indicate country of Constitution]</i>
Tenderer's actual or intended year of incorporation:
Tenderer's legal address [in country of registration]:
Tenderer's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____
1. Attached are copies of original documents of 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 <input type="checkbox"/> 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: <ul style="list-style-type: none">• 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.

4.2 **FORM ELI -1.2**

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

Date: _____

ITT No. and title: _____

Tenderer's JV name:
JV member's name:
JV member's country of registration:
JV member's year of constitution:
JV member's legal address in country of constitution:
JV member's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____
<p>1. Attached are copies of original documents of</p> <p><input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above, in accordance with ITT 3.6.</p> <p><input type="checkbox"/> In case of a state-owned enterprise or institution, documents establishing legal and financial autonomy, operation in accordance with commercial law, and that they are not under the supervision of the Procuring Entity, in accordance with ITT 3.8.</p> <p>2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.</p>

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 1 st January <i>[insert year]</i> specified in Section III, Evaluation and Qualification Criteria, Sub-Factor 2.1.			
Contract(s) not performed since 1 st January <i>[insert year]</i> 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)
<i>[insert year]</i>	<i>[insert amount and percentage]</i>	Contract Identification: <i>[indicate complete contract name/ number, and any other identification]</i> Name of Procuring Entity: <i>[insert full name]</i> Address of Procuring Entity: <i>[insert street/city/country]</i> Reason(s) for nonperformance: <i>[indicate main reason(s)]</i>	<i>[insert amount]</i>
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 2.3as 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)
<i>[insert year]</i>	<i>[insert percentage]</i>	Contract Identification: <i>[indicate complete contract name, number, and any other identification]</i> Name of Procuring Entity: <i>[insert full name]</i> Address of Procuring Entity: <i>[insert street/city/country]</i> Matter in dispute: <i>[indicate main issues in dispute]</i> Party who initiated the dispute: <i>[indicate "Procuring Entity" or "Contractor"]</i> Reason(s) for Litigation and award decision <i>[indicate main reason(s)]</i>	<i>[insert amount]</i>

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)					
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 statements¹ 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.

Average Annual Construction Turnover

Tenderer's Name: _____

Date: _____

JV Member's Name _____

ITT No. and title: _____

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

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

4.6 FORM EN – 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 FIN – 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 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 <input type="checkbox"/>	Member in JV <input type="checkbox"/>	Management Contractor <input type="checkbox"/>	Sub-contractor <input type="checkbox"/>
Total Contract Amount				Kenya Shilling
If member in a JV or sub-contractor, specify participation in total Contract amount				
Procuring Entity's Name:				
Address:				
Telephone/fax number				
E-mail:				

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	

4.11 1 **FORM EXP - 4.2(b)**

Construction Experience in Key Activities

Tenderer's Name: _____

Date: _____

Tenderer's JV Member Name: _____

Sub-contractor's Name² (as per ITT 34): _____


ITT No. and title: _____

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

I. Key Activity No One: _

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

² If applicable



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

2. Activity No. Two

3.

OTHER FORMS

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 SELFDECLARATION OF THE TENDERER attached to this Form of Tender.*
- iv) *The Form of Tender shall include the following Forms duly completed and signed by the Tenderer.*
 - *Tenderer's Eligibility- Confidential Business Questionnaire*
 - *Certificate of Independent Tender Determination*
 - *Self-Declaration of the Tenderer*

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

Request for Tender No.: *[insert identification]*

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

Alternative No.: *[insert identification No if this is a Tender for an alternative]*

To: *[insert complete name of Procuring Entity]* Dear Sirs,

1. In accordance with the Conditions of Contract, Specifications, Drawings and Bills of Quantities for the execution of the above named Works, we, the undersigned offer to construct and complete the Works and remedy any defects therein for the sum of Kenya Shillings *[[Amount in figures]* _____ Kenya Shillings *[amount in words]* _____.

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

The percentage or amount quoted above does not include provisional sums, and only allows not more than two foreign currencies.

2. We undertake, if our tender is accepted, commenced 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: *[Insert one of the options below as appropriate]*

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

Option 2, in case of multiple lots:

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

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

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

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

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

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

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

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

xiii) Suspension and Debarment: We, along with any of our subcontractors, suppliers, 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.

xiv) State-owned enterprise or institution: *[select the appropriate option and delete the other]* *[We are not a state-owned enterprise or institution]* / *[We are a state-owned enterprise or institution but meet the requirements of ITT 3.8]*;

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

Name of Recipient	Address	Reason	Amount

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

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

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

xviii) Fraud and Corruption: We 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;

- xix) Collusive practices: We hereby certify and confirm that the tender is genuine, non-collusive and made with the intention of accepting the contract if awarded. To this effect we have signed the “Certificate of Independent Tender Determination” attached below.
- xx) We undertake to adhere by the Code of Ethics for Persons Participating in Public Procurement and Asset Disposal, copy available from _____ (*specify website*) during the procurement process and the execution of any resulting contract.
- xxi) We, the Tenderer, have completed fully and signed the following Forms as part of our Tender:
- Tenderer's Eligibility; Confidential Business Questionnaire – to establish we are not in any conflict of interest.
 - Certificate of Independent Tender Determination – to declare that we completed the tender without colluding with other tenderers.
 - Self-Declaration of the Tenderer – to declare that we will, if awarded a contract, not engage in any form of fraud and corruption.
 - Declaration and commitment to the Code of Ethics for Persons Participating in Public Procurement and Asset Disposal

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

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

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

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

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

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

Date signed _____ day of _____, _____

Notes

* In the case of the Tender submitted by joint venture specify the name of the Joint Venture as Tenderer

** Person signing the Tender shall have the power of attorney given by the Tenderer to be attached with the Tender.

A. **TENDERER'S ELIGIBILITY- CONFIDENTIAL BUSINESS QUESTIONNAIRE**

Instruction to Tenderer

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

(a) **Tenderer's details**

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

General and Specific Details

b) **Sole Proprietor**, provide the following details.

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

c) **Partnership**, provide the following details.

	Names of Partners	Nationality	Citizenship	% Shares owned
1				
2				
3				

d) **Registered Company**, provide the following details.

i) Private or public Company _____

ii) State the nominal and issued capital of the Company _____

Nominal Kenya Shillings (Equivalent)..... Issued

Kenya Shillings (Equivalent).....

iii) Give details of Directors as follows.

	Names of Director	Nationality	Citizenship	% Shares owned
1				
2				
3				

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

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

If yes, provide details as follows.

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

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 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;
the intention or decision to submit, or not to submit, a tender; or
 - c) 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 PROCUREMENT AND ASSET DISPOSAL ACT 2015.

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

1. THAT I am the Company Secretary/ Chief Executive/Managing Director/Principal Officer/Director of (*insert name of the Company*) who is a Bidder in respect of Tender No. for (*insert tender title/description*) for (*insert name of the Procuring entity*) and duly authorized and competent to make this statement.
2. THAT the aforesaid Bidder, its Directors and subcontractors have not been debarred from participating in procurement proceeding under Part IV of the Act.
3. THAT what is deponed to 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 (*insert name of the Company*) who is a Bidder in respect of Tender No for (*insert tender title/description*) for (*insert name of the Procuring entity*) and duly authorized and competent to make this statement.
2. THAT the aforesaid Bidder, its servants and/or agents /subcontractors will not engage in any corrupt or fraudulent practice and has not been requested to pay any inducement to any member of the Board, Management, Staff and/or employees and/or agents of (*insert name of the Procuring entity*) which is the procuring entity.
3. THAT the aforesaid Bidder, its servants and/or agents /subcontractors have not offered any inducement to any member of the Board, Management, Staff and/or employees and/or agents of (name of the procuring entity)
4. THAT the aforesaid Bidder will not engage /has not engaged in any corrosive practice with other bidders participating in the subject tender
5. THAT what is deponed therein 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 sanctions 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 award¹ of a contract if PPRA determines that the firm or individual recommended for award, any of its personnel, or its agents, or its sub-consultants, sub-contractors, service providers, suppliers and/ or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;
 - d) Pursuant to the Kenya's above stated Acts and Regulations, may 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 inspect² all accounts, records and other documents relating to the procurement process, selection and/or contract execution, and to have them audited by auditors appointed by the PPRA or any other appropriate authority appointed by Government of Kenya; and
 - f) Pursuant to Section 62 of the above Act, requires Applicants/Tenderers to submit along with their Applications/Tenders/Proposals a “Self-Declaration Form” as included in the procurement document declaring that they and all parties involved in the procurement process and contract execution have not engaged/will not engage in any corrupt or fraudulent practices.

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 individual's financial records and information, and making copies thereof as relevant; accessing and examining any other documents, data and information (whether in hard copy or electronic format) deemed relevant for the investigation/audit, and making copies thereof as relevant; interviewing staff and other relevant individuals; performing physical inspections and site visits; and obtaining third party verification of information.

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

Beneficiary: _____

Request for Tenders No: _____

Date: _____

TENDER GUARANTEE No.: _____

Guarantor: _____

1. We have been informed that _____ (here in after called "the Applicant") has submitted or will submit to the Beneficiary its Tender (here in after called "the Tender") for the execution of _____ under Request for Tenders No. _____ ("the ITT").
2. Furthermore, we understand that, according to the Beneficiary's conditions, Tenders must be supported by a Tender guarantee.
3. At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (_____) upon receipt by us of the Beneficiary's complying demand, supported by the Beneficiary's statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Applicant:
 - (a) has withdrawn its Tender during the period of Tender validity set forth in the Applicant's Letter of Tender ("the Tender Validity Period"), or any extension thereto provided by the Applicant; or
 - b) having been notified of the acceptance of its Tender by the Beneficiary during the Tender Validity Period or any extension there to 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.

FORMAT OF TENDER SECURITY [Option 2–Insurance Guarantee]

TENDER GUARANTEE No.: _____

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

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

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

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

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

[Date]

[Witness]

[Signature of the Guarantor]

[Seal]

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

PART II - WORK REQUIREMENTS

SECTION V - DRAWINGS

To be provided during implementation of the project

SECTION VI - SPECIFICATIONS

As per detailed in the bills of quantities.

GENERAL PREAMBLES AND PRICING NOTES**A. GENERAL PREAMBLES**

The General Specification as prepared by the National Housing Corporation is issued to the Contractor with the Bills of Quantities.

All items in the Bills of Quantities shall conform to the full Specification for similar items in the General Specification.

All materials and workmanship shall conform to relevant standards and requirements stipulated by Kenya Bureau of Standards.

Where the wording “as described” is included in the Bills of Quantities this wording shall be construed as either an abbreviation of a detailed description for similar items in the General Specification or as a reference to the preambles.

Where detailed descriptions in the Bills of Quantities differ in any respect to similar descriptions in the General Preambles, then such descriptions in the Bills of Quantities shall be deemed to take precedence.

B. EXCAVATION

Shall be to the widths and depths indicated on the drawings or to such lesser or greater depth as the Engineer may deem necessary and so instruct the contractor in order to obtain satisfactory foundations.

C. STARTING LEVEL

Unless otherwise described the starting level of all excavations has been measured from the level remaining after completion of reduced level excavation, generally taken as the underside of 200 surface strips.

D. CLASSIFICATION OF EXCAVATED MATERIAL CLASS I ROCK OR HEAD MATERIAL

This class shall consist of all materials which cannot be removed except by blasting, by the use of metal wedges and sledgehammers or by ripper with heavy tractor and rear mounted hydraulic single type heavy –duty ripper.

Boulders greater than 0.5CM; when their nature and size is such that they cannot be removed without recourse to one or more of the methods described above shall also be in class one.

**EXCAVATION TRADE
PREAMBLES**

EXCAVATION (CONT'D)

Where the boulders constitute 50% or more of a particular part of the excavation, such part shall be considered as class 1 material throughout.

A. CLASS 2 NORMAL OR SOFT MATERIAL

This class shall constitute all materials which can be removed without recourse to the methods described for class I above, and/or class 3 below.

B. CLASS 3-COMPACTED GRAVEL OR DECOMPOSED ROCK

This class shall constitute of all materials such as consolidated murram gravel decomposed or stratified rock, stone and boulders less than 0.5CM, harder than class 2, but which can be excavated by ripping or which in confined spaces, requires excavation by hand using compressor tools.

C. EXCAVATION WORK

Excavation work is measured net as before digging and the Contractor must allow for increases in bulk after digging.

D. FILLING

Filling is measured net after consolidation. Filling obtained from surplus excavated materials is to be free from all weeds, roots, vegetable soil or other unsuitable materials and is to be filled in layers each of not more than 225mm finished thickness. Each layer shall be well wetted and consolidated as described hereafter.

E. NO BORROW PITS

No borrow will be allowed to be opened on the site.

F. REMOVAL OF SURPLUS MATERIALS

All surplus excavated material, where so directed, and all rubbish, is to be carried away from the site and the Contractor shall find his own dump and pay all charges.

A FOUNDATIONS NOT TO BE COVERED

No excavations or foundations work shall be filled in or covered up until all measurements necessary for the adjustment of variations have been made by the Surveyor.

B HARDCORE FILLING

Hardcore for filling under floors, etc, shall be hard broken quarry waste to the approval of the Engineer 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 lesser 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 225mm and well watered and rolled with a vibrating roller where rolling is impossible, compaction shall be by hand or mechanical tampers.

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 50mm layer of stone dust or murram, well watered and rolled to receive concrete or paving.

CONCRETE WORK**A. NOTES CONCERNING MEASUREMENT AND PRICING**

The Contractor must allow for all costs incurred during progress of the contract for complying with the provisions concerning the preparation and use of graded mixes.

Prices for concrete shall include for mixing and depositing as described or indicated and for hoisting and depositing at the various levels required throughout the building and shall also include for forming or hacking a satisfactory key for all faces receiving asphalt and plaster work. Prices for slabs shall also include for levelling off the surface as described under "Compaction" and all temporary formwork to form construction joints at bay edges.

Prices for reinforced concrete shall, in addition, include for filling into, between or on formwork, and thoroughly compacting between and around rods or fabric reinforcement and for forming all additional construction joints between varying mixes. Where described as 'vibrated', prices must include for fully vibrating as described.

Prices for formwork shall include for extra material at joints, extra labour and waste for narrow widths, small quantities, overlaps, passing at angles straight cutting and waste, splayed edges, notching, etc and for fixing at the various levels including battens, struts, and supports for bolting, wedging, easing, striking and removal. Prices for linear items such as boxing shall include for angles and ends.

Prices for steel rod reinforcement shall include for cutting to lengths and all labour in bending and cranking, forming hooked ends, handling, hoisting and fixing in position and for providing all necessary tying wire and supports. Prices for fabric reinforcement shall include for all straight cutting and waste, handling, hoisting and fixing in position, producing all necessary tying wire supports and all extra material laps.

Prices of all precast concrete shall include for all moulds, finishing 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.

CONCRETE WORK TRADE
PREAMBLE

A. ARCHITECT/ENGINEER

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

B. CODE OF PRACTICE

All workmanship, materials, tests and performance in connection with the reinforced concrete work are to be in conformity with the latest edition of the British Standard Code of Practice (BS 8110 of 1997 "The Structural Use of Reinforced Concrete in Buildings") where not inconsistent with these Preambles.

C. 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.

D. 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, 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 Preambles, the Bills of Quantities or the Drawings require specific procedures to be followed, such requirements are not to be construed as prohibiting the 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.

CONTRACOR'S PLANT, EQUIPMENT AND CONSTRUCTION PROCEDURES(CONT'D)

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

A. LEVELS AND FOUNDATIONS

The foundations of the works shall be carried down to depths as 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 the solid ground, except whereotherwise 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.

B. TOLERANCE

All insitu concrete work shall be dimensionally accurate to within the followingtolerances:-

.01 between the centre line of principal member's columns or beams

+/- 5mm up to 15 metres c/c

+/- 10mm over 15 metres c/c

Note the +/- 10mm tolerance shall not be accumulative.

.02 In storey height

+/- 5mm floor to floor

.03 In plumpness of columns and walls

+/- 10mm on any storey or overall the structure

TOLERANCE (CONT'D)

.04 In level of floors

+ 5mm /- 3mm of the true prescribed horizontal surface level

.05 In cross sectional dimensions of column beams and walls

+ 5mm/- 3mm in any dimensions up to 2 metres overall

+10mm/- 3mm in any dimension over 2 metres.

.06 Cover to reinforcement

+5mm/5 of the stated covers

The Contractor shall be responsible for the cost of all corrective measures required by the Engineer to rectify work which is not construed within the tolerances set out above.

A. MATERIALS GENERALLY

All materials which have been damaged, contaminated or have deteriorated or do not comply in any way with the requirements of these Preambles 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.

B. 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 and construction do not comply with the requirements of these Preambles, the Contractor will be responsible for the costs of the tests and the replacement of defective materials and/or construction.

A. CEMENT

Cement unless otherwise specified shall be ordinary Portland Cement of a brand approved by the Engineer and shall comply with the requirements of B.S. 12, with the exceptions that it may contain reactive volcanic ash of not more than 10 per cent of the total weight and the quality of insoluble residue permitted in B.S. 12 may be exceeded on this account only. A manufacturer's Certificate of Test in accordance with B.S. 12 shall be supplied for each consignment delivered to the site.

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 it is to be stored in a weather proof 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 1.5m in height.

B. AGGREGATES

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

The grading of aggregates shall be one 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 not varied without the approval of the Engineer. Fine aggregate shall be clean, coarse, 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 1 or 2 of Table 2 of B.S. 882.

Coarse aggregate shall be good, hard, clean, approved black trap or similar stone, free from dust, decomposed stone, clay, and earth matter, foreign substances of 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.

CONCRETE WORK TRADE PREAMBLES

AGGREGATES (CONT'D)

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 at the Contractor's expenses.

Aggregates shall be delivered to the site in their prescribed sizes or grading and shall be stocked-piled on paved areas or boarded platforms in separate units to avoid intermixing. **On no account shall aggregates be stock-piled 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. All such testing be carried out at the Contractor's expense.

A. WATER

The water used for mixing concrete shall be from an approved source, clean, fresh and free from impurities and comply with the requirements of B.S.3148.

B. EXPANSION JOINT FILLER

Expansion joint filler shall be "Flexcel" as manufactured by Expedite Ltd, "Resilex" as manufactured by Evomastics Ltd or equivalent and approved filler.

C. CONCRETE STRENGTHS

Grade "35", "30", "25" and "20" concrete shall have minimum strengths as given by Works Cube Tests shown on Page 2/9

	MINIMUM CRUSHING STRENGTHS	DITTO	DITTO	DITTO
	Grade 35	Grade 30	Grade 25	Grade 20
7 days	23.5 N/mm ²	20.00 N/mm ²	16.5 N/mm ²	13.5 N/mm ²
28 days	35.0 N/mm ²	30.0 N/mm ²	25.0 N/mm ²	20.0 N/mm ²

CONCRETE STRENGTHS (CONT'D)

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

Grades lower than those given shall be of nominal mixes and may be measured by volume or weight. Unless the Engineer directs so, no cube tests will be required for these grades.

Nominal mix by column	-	1:3:6	1:4:8
Cube metres of Fine Aggregate Per 50Kgs bag of cement	-	0.12	0.16
Cubic metres of Fine Aggregate Per 50Kgs bag of cement	-	0.24	0.32
Max size of Coarse Aggregate	-	20mm	20mm

A. CEMENT

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

AGGREGATE

- (i) For grades "35", "30", "25" concrete aggregates shall be measured by weight in a weight batching machine as described hereafter.
- (ii) For lower grade concrete, aggregates may be measured by weight or by volume, where approved gauge boxes of such a size as will give the correct proportions shall be used.

B. WEIGHT BATCHING MACHINES

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

A. CONCRETE MIXES

The weights of fine and coarse aggregate to be used in concrete mixes "35", "30" 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 each of the mixes 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 at least 25 per cent higher than the strengths specified for work cube test. If contractor is unable to produce specified cube strengths he will be required at his own cost to increase the cement contents of the mix until satisfactory results are produced.

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 strengths or improved workability and providing that the total proportions of aggregate to cement remain unchanged, no claim for additional cost will be considered.

GRADE	Grade 35	Grade 30	Grade 25	Grade 20
Minimum cement Content by weight to Combined total	Design Mix	1:1:2	1:1½:3	1:2:4
Weight of aggregate	1 to 4	1 to 4	1 to 5	1 to 6

Work cubes are to be made at intervals 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 Code of Practice.

Six cubes shall be made on each occasion, from different batches, the concrete being taken from the point of deposit.

CONCRETE MIXES (CONT'D)

Each cube shall be marked with a distinguishing number (number 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:.....

- (e) 28-day Test

Date:.....

Strength:.....

Cubes shall be forwarded, carriage paid to an approved Testing Authority in time to be tested three at 7-days and three at 28-days. No cube shall be dispatched within three (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 aggregate so as to find concrete which does comply with the requirement 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.

CONCRETE MIXES (CONT'D)

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 and testing of test cubes and no claim in respect of his failure to do so will be entertained.

A. MAKING 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 0.5/0 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 threeminutes** 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 per cent 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 BS. 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.

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.

MAKING AND PLACING OF CONCRETE (CONT'D)

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 for placing concrete is subject to the prior approval of the Engineer.

Concrete shall be placed from a height not exceeding 1.500m. 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 1.500m. deep in walls and similar members.

Concrete in columns may be placed to a height of 4.000m. 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 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 position 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 wirebrushing before further concrete is placed.

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

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

MAKING AND PLACING OF CONCRETE (CONT'D)

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

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

A. 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 or 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, spacing, slicing and vibration. **Vibration is required for concrete of Grades "35", "25" and "20".**

Care shall be taken to fill every part of the forms, to work the concrete under and around 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 is removed.

Internal vibrations shall be of a frequency of not less than 7,000 cycles per minute and shall have a rotating eccentric weight of at least 0.75Kg with an eccentricity of not more than 15mm. Such vibrators shall visibly affect the concrete within a radius of 250mm from the vibrator.

Internal vibrators shall not be inserted between layers of reinforcement less than one 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 500mm centres and shall constantly be moved from place to place.

COMPACTION (CONT'D)

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 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 two cubic metres of concrete placed per hour and at least one spare vibrator shall be maintained on site in case of breakdown 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 1.200mm 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 aptitude type operating ata speed of not less than 3.000 r.p.m.

A. CONSTRUCTION JOINTS

Construction joints shall be permitted only at the positions predetermined on the Drawings or as instructed on the sites by the Engineer. In general they shall be perpendicular to the lines of principal stresses and shall be located at points of minimum shear, viz. vertically at, or near mid-spans of slabs, ribs and beams.

CONSTRUCTION JOINTS (CONT'D)

Suspended concrete slabs are generally to be cast using alternate bay construction in bays not exceeding 15.00m 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 already hardened, the face of the old concrete shall be thoroughly hacked, roughened and cleaned and laitance and loose material removed there from, and immediately before placing the new concrete the surface shall be saturated with water and covered with a coat of mortar at least 25mm in thickness composed of cement and fine aggregate in the proportions used in the concrete.

A. CURING AND PROTECTION

Care must be taken 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 width obtainable and shall be secured against wind. **The Contractor will not be permitted to use bags, hessian or other material in small places.**

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 periods than those specified hereafter.

A. FAULTY CONCRETE

Any concrete which fails to comply with these Preambles 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 whatever, which may be occasioned by the need to remove faulty concrete, shall be borne by the Contractor.

B. ROD REINFORCEMENT

The steel reinforcement shall comply with the latest requirements of the following British Standards:-

4449:	1988	Specification for bars for the reinforcement of concrete.
4466:	1989	Bending dimensions and scheduling of bars for the reinforcement of concrete
4483:	1985	Steel fabrics for the reinforcement of concrete

The Contractor shall submit a test certificate of the rolling. Reinforcement shall be stored on racks above ground level. All reinforcement shall be free from loose mill scales or rust, grease, paint or other substances likely to reduce the bond between the steel and concrete.

C. FABRIC REINFORCEMENT

Fabric reinforcement shall be electrically cross-welded steel wire mesh reinforcement to B.S. 4483 and of the size and weight specified.

A. 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 cut and bent cold and no welded joints will be permitted unless so detailed.

No concreting shall be commenced until the reinforcement in position and until his approval has been obtained. The Contractor shall give two clear day's notice of his intention to concrete to the Engineer.

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 concretos to adjust and correct the positions of any reinforcement which may be displaced. The vibrators are not to come into contact with the 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 bending schedules and is fixed exactly in the positions shown therein and in the positions to give the prescribed cover.

B. COVER TO ROD REINFORCEMENT

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 bending schedules.

Spacing blocks of approved size and shape of concrete similar to that used in the surrounding construction and fixed to the reinforcement on 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 providing sufficient such spacer blocks in his prices for steel reinforcement.

COVER TO ROD REINFORCEMENT (CON'TD)

Unless otherwise directed the concrete cover to rod reinforcement over mainbars in any face shall be:-

Foundations against earth face	75mm
Foundations against blinding	50mm
Columns	40mm
Beams	25mm
Slabs	20mm
Walls	25mm

A. 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. appealed iron wire.

Where reinforcement projects from a concrete section of the structure and this reinforcement is expected to remain exposed for some time, it is to be coated with 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.

B. FIXTURES AND INDENTATIONS IN CONCRETE

No openings, chases, holes or other voids shall be formed in the concrete without the approval of the Engineer. Details of any fixtures to be permanently build into the concrete including the proposed positions of all conduits 25mm andover in diameter shall be submitted to the Engineer for his approval before beingplaced.

A. CHASES, HOLES ETC IN CONCRETE

The Contractor shall be responsible for the co-ordination with the Electrical and other Sub-Contractors for incorporating electrical conduits, pipes, fixing blocks, chases, holes and the like in concrete members as required and must ensure thatadequate notice is given to such Sub-Contractors informing them when concrete members incorporating the above are to be poured. The Contractor shall submitfull 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.

Unless otherwise instructed by the Engineer, all electrical conduits to be positioned within the reinforced concrete shall be **fixed inside** the steel cages ofbeams and columns and **between the top and bottom** steel layers in slabs and similar members.

B. FORMWORK

The method and systems of formwork which the Contractor proposes to use shallbe 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 of good sound, clean, sawn, well seasoned timber, free from warps and loose knots and of scantlings sufficiently strong for their purpose.

C. 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 preventdisplacement, vibration or movement by the weight of materials, men and plant on same and so wedged and clamped as to permit of casing and removal of the formwork without jarring the concrete.

CONSTRUCTION OF FORMWORK (CONT'D)

Where formwork is supported on previously constructed portions of the reinforced concrete structural frame, the Contractor shall by consultation with the Engineer 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 4.000m of 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 particular 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 beams 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 formwork.

**CONCRETE WORK TRADE
PREAMBLES**

CONSTRUCTION OF FORMWORK (CONT'D)

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, casing, striking and removing of all formwork must be done under the personal supervision of competent foremen, 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 at the Contractor's expense. Any voids or honeycombing shall be treated as described under "Faulty concrete".

A. 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, wall and columns (unloaded)	-	2 days
Slab soffits (props left under)	-	3 days
Beam soffits (props left under)	-	7 days

Removal of props (partly subject to 7 days concrete cube strength being satisfactory)

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.

STRIPPING FORMWORK (CONT'D)

The above times may be reduced in certain circumstances, at the discretion of the Engineer provided an approved method is adapted at the Contractor's expense to ensure that the required concrete strength is attained before the forms are stripped.

The tops of retaining walls shall be adequately supported with stout raking props at intervals required by the Engineer. These props are not to be removed until after 7 days after casting of the floor slab.

A. FAIR FACE FINISHED

Where fair face finish is specified the concrete shall be brought to a perfectly true smooth and even surface by rubbing with carborundum stone dipped in cement grout. Such work must be commenced within one hour of removing the formwork and actively and rapidly pursued until completed, the objective being to complete the finish as soon as possible after removal of 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, joints 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.

B. PRECAST CONCRETE

Unless otherwise approved by the Engineer, all precast concrete construction shall be carried out on the site and shall conform to requirements given elsewhere in these Preambles.

The minimum size of coarse aggregate in precast concrete shall not exceed 20mm and for thicknesses less than 75mm it shall not exceed 15mm.

PRECAST CONCRETE (CONT'D)

The compacting of precast concrete shall conform with requirements given elsewhere in these preambles 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.

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 into position.

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 unit shall be replaced by the Contractor at his own expense.

Except where precast work is described as "fair face" or as having an "exposed aggregate" or terrazzo finish, the moulds shall be made of suitable strong sawn timber true in form to the shapes required. Unless otherwise described, faces are to be left rough from the moulds.

Where precast concrete work is described as "fair face" the moulds 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, pinnacles 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.

CONCRETE WORK TRADE PREAMBLES

PRECAST CONCRETE (CONT'D)

Where precast work is to have an “exposed aggregate” or terrazzo finish the moulds shall be constructed to the requirements given for moulds for “finished fair” work. The method of achieving the exposed aggregate finish shall be the “aggregate transfer” or other approved methods.

The precast units shall be installed to the lines, grades and dimensions shown on the Drawings or as directed by the Engineer.

A. 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 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 and the start of compaction of the top 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 hand or mechanical tamper weighing not less than 10 Kgs per metre run and having a tamping edge shod with a steel strip 75mm wide fixed to the tamper by countersunk screws. Immersion vibrator with “spade” attachment will be permitted. Compaction shall be continued until a dense, scaled surface finish is achieved. Over compaction causing an excessive amount of lines to be brought to the surface shall be avoided.

CONCRETE SURFACE BEDS (CONT'D)

The surface of the concrete shall be finished to the surface texture specified to the levels, falls and cross-falls, as directed or shown on the drawings and shall be subject to the following tolerances:-

The level be within + to – 6mm of the levels specified The falls shall be within 10% of the falls specified

The smoothness shall be such that departures 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.

As soon as the surface has been finished, it shall be protected against too rapid drying by means of polythene sheeting or other approved means placed carefully on the surface and kept damp and in position for 7 days and the concrete shall be kept wet for a further 21 days. The most critical period is the first 24 hours after placing or curing during that time shall be very thorough. The Contractor is to obtain the Engineer's approval to the material and method he proposes to use for curing and no concreting will be permitted until sufficient such material is on site.

Forms shall not be removed from freshly placed concrete until it is at least 24 hours old. Care shall be taken that in their removal no damage is done to the concrete, but should any damage occur the Contractor shall be responsible for making it good.

MASONRY AND BLOCKWORK**A. GENERALLY**

- (i) Prices for all walling shall include for normal rough and **straight cutting**, plumbing angles, all cutting and waste and split courses necessary for bond, bonding at angles, intersections and junctions of walling of all thicknesses, split courses, cutting and pinning up to columns, beams, slabs, etc., hoisting and building at any level, forming all openings and reveals to same and all cutting and waste to walling in short lengths such as mullions unless specifically measured.
- (ii) Prices for hollow block walling must further include for all necessary solid blocks or fine concrete filling to open ends of blocks at intersections, ends and angles of walling.
- (iii) Prices for damp-proof courses, which are measured the net area covered, shall include for all cutting and waste and extra material in laps at joints, angles, etc.

B. CEMENT

All cement used for making mortar shall be Portland cement as described in "Concrete Work".

C. SAND

All sand used for making mortar shall be clean, well graded siliceous sand of good sharp quality, equal to sample, 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.

D. LIME

- (i) Lime for mortar shall be non-hydraulic or semi-hydraulic quick lime or hydrated lime in accordance with B.S. 890, Class 'B'.
- (ii) Quick lime shall be run to putty immediately after delivery to the site in a pit dug on the site or in an approved container. 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.

LIME (CONT'D)

- (iii) 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.

A. CEMENT MORTAR

Cement mortar shall be composed of Portland cement and sand in 1:4 ratio by volume, measured in specially prepared gauge boxes and thoroughly mixed in an approved mechanical mixer or mixed dry on a clean and approved mixing platforms, with added afterward until all parts are completely incorporated and brought to a proper consistency. The use of re-tampering of wholly or partially set mortar will not be allowed.

B. CONCRETE BLOCKS

- (i) Concrete blocks shall be solid, hard, true to size and shape with sharp arises in accordance with B.S 2028 type 'A', and approved by the Architect.
- (ii) They shall be obtained from an approved manufacturer or manufactured on site in approved block making machines. The cement aggregate mix used shall be not less than 1:9 by volume and the maximum size of aggregate shall not exceed 12mm.
- (iii) All solid and hollow concrete blocks used in walling must be capable of withstanding a crushing pressure of not less than 2.80 N/mm² after 28 days.
- (iv) The blocks on removal from the machine shall be carefully deposited on edge on racks under sheds erected by the Contractor and left for 3 days during which period they shall be kept constantly wet after which they shall be placed on edge in the open on racks and protected by sacking or other approved covering and kept wet for further 5 days. Thereafter the blocks shall be left in the same position without wetting for a further 20 days.
- (v) No blocks will be allowed to be used in the work until 28 days old and until samples have been taken and approved by the Architect.

CONCRETE BLOCKS (CONT'D)

- (vi) They shall be laid dry except for the top surface which shall be wetted immediately before mortar is spread on. After laying no further water shall be applied.
- (vii) The concrete blocks shall be 200mm. high to bond satisfactory with all other walling.

A. STONE WALLING

- (i) 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. It shall be chisel dressed into true rectangular blocks, with each surface even and at right angles to all adjoining surfaces.
- (ii) The contractor shall if necessary re-dress the beds of stones on the site to the minimum extent required to obtain uniformity of coursing, and his Tender shall be deemed to include for such re-dressing.
- (iii) Stone block for general walling shall nominally be 200mm. high, 90mm. 140mm or 190mm. thick as required for the works, the maximum permissible variations of any of the foregoing dimensions being 12mm.
- (iv) Stone shall not be less than 400mm. long but a proportion of 20% will be permissible in lengths between 300mm. and 400mm long. Samples shall be submitted to the Architect for approval and when so approved shall become the standard for the works.

B. STABILIZED EARTH

These shall consist of cement mixed with selected approved red soil in a proportion not less than 1:20 by volume.

The manufacture and curing of the blocks shall generally be as described for concrete block above.

C. BEDDING AND JOINTING

The blocks shall be bedded and joined in cement and sand mortar as described with beds and joints not more than 12mm. or less than 6mm. thick, all flushed up and grouted solid as the work proceeds.

A. REINFORCED WALLING

Walls of less than 225mm. thickness shall be reinforced with one row of 20 gauge hoop iron 20mm. wide, built into every third course, well lapped at junctions and joints and carried at least 100mm. into abutting walls at intersections.

B. PROTECTION

All walling shall be properly protected while mortar is setting, as the Architect shall direct.

C. SETTING OUT RODS

The contractor shall provide proper setting out rods and set out all work on the same for courses, opening heights, etc., and shall build the walls, piers, etc., to widths, depths and heights indicated on the Drawings. Setting out rods to be gauged to allow an average height of 200mm. for each course.

D. CURING OF WORK

All walls shall be maintained in a damp condition for at least 24 hours after laying. Wall under construction shall be damped by applying water with a brush and no hoisting directly on the wall shall be permitted. When the work ceases on any section of the wall, polythene or hessian shall be draped over the wall, for at least 24 hours. If hessian is used it shall be maintained continuously wet.

E. WALL TIES

Wall ties shall be provided to connect walls to steel or concrete columns and beams to connect two unbonded leaves of wall.

Wall ties shall be provided at 450mm centres both vertically and 900mm centres horizontally. Wall ties shall be provided at 450 centres both vertically and 900mm centres horizontally. Wall ties shall be staggered when used to connect two leaves of unbonded walls.

ROOFING

A. GENERALLY

Bituminous felt, flashing, etc., have been measured the net area covered. Prices shall include for all straight cutting and waste and laps and in case of flashing, aprons, covering to kerbs, etc., where the net covered girth is measured and necessary overlaps for bond with adjoining areas.

BITUMINOUS FELT ROOFING

B. BUILT-UP ROOFING

The built-up roofing shall be in accordance with B.S 747 (classes 1,2, and 5) applied to a screeded base and shall comprise the following applications (see Clause 'E' below), laid strictly in accordance with the manufacturer's printed instructions and the Code of Practice 144.101.

C. STORAGE

Rolls must be transported and stored on end, one roll high, and adequately protected from the sun.

D. SCREED

The minimum fall for the screed on flat roofs be 1 in 30. The screed must be thoroughly dry and swept clean before commencing laying operations.

E. SEQUENCE

- | | |
|--|--|
| <p>(i) <u>Jointing Compound</u>: -</p> <p>16.3 Kgs per 10 square metres.</p> | <p>One application of hot bituminous compound weighing not less than</p> |
| <p>(ii) <u>First Layer</u>:</p> <p>(class 1A)</p> <p>Kgs per Sq. m.</p> | <p>One layer of self finished felt weighing not less than 13.6</p> |
| <p>(iii) <u>Jointing Compound</u>:</p> | <p>As described in (i) above.</p> |

ROOFING (CONT'D)

- | | | |
|--|---|--|
| Kgs per Sq. m. | (iv) <u>Second Layer:</u>
(class 1A) | One layer of self finished felt weighing not less than 13.6 |
| | (v) <u>Jointing Compound:</u> | As described in (i) above. |
| per 10 Sq m. (Colour to be decided by the Architect) | (vi) <u>Third Layer:</u>
(Class E) | One layer of mineral surfaced roofing felt weighing not less than 36.2 Kgs |

RESIN COT PROFILED OR CORRUGATED GALVANISED SHEETS**A. MATERIALS:**

Resin cot galvanised corrugated sheeting and accessories shall be of approved manufacture in accordance with B.S 3083 and of an approved colour. The thickness of the sheeting shall be as specified and shall be laid and fixed strictly in accordance with the manufacturer's printed instructions.

Resin cot galvanized profiled sheeting and accessories shall be approved manufacture in accordance with BS 3083 and of an approved colour. The thickness of the sheeting shall be as specified and shall be laid and fixed strictly in accordance with manufacturer printed instructions.

B. LAPS:

Sheeting shall be laid with ends laps of 150mm. and side laps of one corrugation on the side away from the prevailing wind.

C. FIXING TO PURLINS:

The sheets shall be fixed to 150 x 50mm timber purlins with 8mm. galvanised gimlet pointed screws 114mm. long. All screws and bolt fixings shall have "Selawasher" plastic washers or other equal and approved.

D. HOLES:

Holes shall be drilled through the ridges of corrugations, not in the hollows.

E. RIDGES ETC.

Ridges and other accessories shall be supplied as shown on the Drawing and shall be fixed to purlins as above described.

ROOFING**TRADE PREAMBLES**

CARPENTRY**A. TIMBER FOR STRUCTURAL WORKS**

All timber for structural works to be grade GS or SS cypress, seasoned to moisture content of almost 15%; and cell-cured or treated with approved preservative.

B. GENERALLY

All timber as it arrives on the site shall be inspected by the Contractor, and any timber brought on the site and not complying with the specification or not approved must be removed forthwith from the site and only timber as approved shall be used in the works.

The Contractor shall upon signing the contract, purchase sufficient supplies of specified hardwood to avoid possible shortage at a later date.

C. SPECIES OF TIMBER

The following timber shall be used: -

<u>Standard Common Name</u>	<u>Botanical Names</u>
Podocarpus	<i>Podocarpus spp.</i>
Cypress	<i>Cypress</i>
Cedar	<i>Juniperus Procera</i>
African Mahogany (munyama)	<i>Khay Anthotheca</i>

D. TOLERANCES IN THICKNESS

Shall conform with the following extracts from the Government of Kenya Grading Rules (or the metric equivalent).

(i) Hardwood Grading (First and Second Grades)

The following tolerances in thickness will be omitted:-

- (a) 1 ½ mm oversize on pieces up to 25mm in thickness
- (b) 3mm oversize on pieces over 25mm and up to 50mm in thickness
- (c) 6mm oversize on piece over 50mm in thickness.

TOLERANCES IN THICKNESS (CONT'D)

- (ii) Softwood grading: Strength Grades (for Carpentry) first and second Grades. Undersize not allowed.

Oversize. All timber to be sawn oversize by 1 ½ mm per 25mm thickness and width. Not more than 3mm in thickness and not more than 6mm in width.

- (iii) Softwood Grading Appearance, Grades (for Joinery) First and Second Grades. All as for Strength Grades above.

All timber 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 this own cost all work necessary to eradicate insect attack of timber which becomes evident including the replacement of timber attack or suspected of being attacked, notwithstanding that the timber concerned may have already been inspected and passed as fit for use.

A. SEASONING OF TIMBER

All timber shall be seasoned to a moisture content of not more than 15% for Carpentry.

B. PRESSURE IMPREGNATION TREATMENT

All carpentry timber, sawn joinery and timber groups for fixing shall be treated with pressure impregnated "Celcure" or "Tanalith" solution with a minimum net retention of 5.6 Kg of dry salt per cubic meter. If so required "Charge Sheets" issued after treatment with "Celcure" or "Tanalith" shall be submitted by the Contractor to the Architect for his retention. All cut ends and any other cut faces or timbers sawn after treatment shall be treated before fixing with "Celcure" B or "Wolmanol" solution brushed on. The contractor's prices for such timber hereinafter must allow for the above treatment.

C. INSPECTION AND TESTING

The Architect shall be given facilities for inspection of all works in progress whether in workshop or on site. The contractor is to allow for testing or prototypes of special construction and the Architect shall be at liberty to select any samples he may require for the purpose of testing i.e. for moisture content, or identification, species strength, etc., such test will be carried out by the Forestry Department.

A. CLEARING UP

The contractor is to clear out and destroy or remove all cut ends, shaving and other wood waste from all parts of the building and the site generally, as the work progress and at the conclusion of the work.

This is to prevent accidental borer infestation and to discourage termites and decay.

B. WORKMANSHIP

All carpenter's work shall be accurately set out strictly in accordance with the drawings and shall be framed together and securely fixed in the best responsible manner with properly made joints, all brands nails and screws shall be provided as necessary, directed, and approved, the contractor's prices shall allow for all the foregoing.

All workmanship shall be of the best quality.

C. DIMENSIONS

Dimensions of timber for carpentry left with sawn faces shall comply with the previous clause specifying tolerance in thickness. Dimensions for wrought members shall be as described in joinery.

D. JOINTING

All timber shall be as long as possible and practicable eliminate joints. Where joints are unavoidable surfaces shall be in contact over the whole area of the joint before fastenings are applied.

No nails, screws or bolts are to be fixed in any split. If splitting is likely, or is encountered in the course of the work, holes for nails are to be prebored at diameter not exceeding $\frac{4}{5}$ th of the diameter of the nails. Nails must be bent at right angles to the grain.

Lead holes are to be bored for all screws. When the use of bolts is specified the holes are to be bored from both sides of the timber and are to be of the diameter $D/16$ 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.

JOINERY**A. ALL TIME TIMBER**

All timber shall be First (OR PRIME) Grade. Species of timber tolerance shall be as defined under "Carpentry".

B. GENERALLY

All joiners' work shall be accurately set out on boards to full size for the information and guidance of the artisans before commencing the respective works, with all joints iron work and others connected therewith fully delineated. Such setting out must be submitted to the Architect and approved before such respective works are commenced.

All joiners' work shall be cut out and framed together as soon after the commencement of the building as is practicable, but not wedged up or glued until the building is ready for fixing same. Any portions that warp, twist or develop shakes or other defects within six months after completion of the works shall be removed and new fixed in their place together with all other work which may be affected thereby all at the contractor's own expense.

All work shall be properly mortised, tenoned, housed shouldered, dovetailed, notched, pinned branded, etc., as directed and to the satisfaction of the Architect and all properly glued up with the best quality glue.

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, sprig etc., are to be punched and putted. Loose joints are to be made where provision must be made for shrinkage, glued joints where shrinkage need not be considered and where scaled joints are required. Glued for load bearing joints or where conditions may be guaranteed casein or organic glues may be used.

All exposed surfaces of joinery work shall be wrought and all arises "cased off" by planing and sandpapering an approved finish suitable to the specified treatment.

C. INSECT DAMAGE

All timber shall be free of insect damage as defined under "Carpentry".

D. SEASONING OF TIMBER

All timber shall be seasoned to a moisture content of not more than 15%.

A. DIMENSIONS

3mm reduction of specified sizes will be allowed to each wrought face except where described as finished size in which joinery shall hold up to the full dimensions.

The contractor is to note that all joinery timber size nominal unless otherwise stated as finished sizes. The nominal sizes have been calculated in accordance with Standard method of Measurement of Building works for East Africa 1st Edition metric and no regard has been taken of metre sizes of timber at present being sold.

B. FIXING JOINERY

All beads, fillets and small members shall be fixed with round or oval brads or nails well punched in and stopped. All larger members shall be fixed with screws. Brass screw shall be used for fixing of all hardwoods, the heads let in and pelleted over with wood pellets to match the grain.

C. BEDDING FRAMES ETC.

The contractor's rates must include for bedding frames, sills, etc., in mortar or dressing surfaces of walls, etc. in lieu.

D. PLUGGING CONCRETE AND WALLS

Round wood plugs shall not be used, all work described as plugged shall be fixed with screws to plugs formed by drilling concrete walls, etc., with a proper tool of suitable size at 750mm spacings and filling the holes completely with "Philplug" rawl plastic or Rawlplugs in accordance with the manufacturer's instructions. Alternatively, and where so agreed by the Architect hardwood dovetailed fixing slips dipped in "Wolmanol" or "Celcure" solution and cut and pinned or bedded in cement (1:3) mortar may be used.

E. FIBREBOARD

Shall be 12mm "Celotex" or equal and approved.

F. PLYWOOD

Shall comply with B.S 145S (First Quality "interior type unless otherwise specified).

G. BLOCKBOARD

Shall be laminated board faced both sides with 4mm plywood. Exposed edges shall be lipped with 19mm hardwood and rates shall include for lipping.

JOINERY (CONT'D)**A. PLASTIC SHEETING**

Shall be "Formica" sheeting 1.5mm thick and securely fixed with approved type waterproof adhesive and in the colours approved by the Architects.

B. CHIPBOARD

Shall be resin bonded and shall comply with BS 2604.

C. PROTECT JOINERY

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

D. FLUSH DOORS

All flush doors shall be manufactured to the thickness specified and consists of 100mm. Wide fixing all around with horizontal core battens not more than 75mm. Centre pressure impregnated as described and bored with 12mm diameter ventilation holes at 300mm centres. Doors shall have two lock blocks and be faced both sides with 6mm ply and have 25mm mahogany twice rebated lipping all round or otherwise be equal to an approved sample. External flush doors shall be as described above but faced both sides with marine quality plywood, same should be for kitchen and bathroom.

E. PRICES TO INCLUDE

Prices of items hereafter shall included for the foregoing labours, etc., and in addition all prices for linear items are to include all internal and external angles, either mitred or tongued, all fair fitted, stopped, notched or returned ends all similar incidental labours and all the lengths.

F. BOTTOM EDGES

Bottom edges of doors shall be painted with one coat of approved primer before fixing.

G. IRONMONGERY

All locks ironmongery shall be fixed with screws etc. to match. Before the woodwork is painted, handles shall be removed. Carefully stored and refixed after completion of painting and locks oiled and left in project working order. All keys shall be labelled with the door reference marked on labels before handling to the Architect on completion.

IRONMONGERY**A. GENERALLY**

All ironmongery shall be fitted and fixed in accordance with the manufacturer's printed instructions. Rates for fixing are to include for all cutting, sinking, boringnoticing and fitting in hardwood or softwood and for supplying all necessary and matching screws.

All locks shall be provided with a master key system and prices shall include for this. The requirement must be obtained by the contractor before ordering. The keys of all locks shall have labels attached with door reference marked on beforehanding to the Architect.

B. MOVABLE PARTS

All locks, springs and other items of ironmongery with moveable parts shall be properly tested, cleaned and adjusted where necessary to ensure proper working order at the completion of the works and left in perfect working order by the Contractor.

C. SAMPLES

- (i) Samples of all ironmongery specified shall be submitted to the Architect for approval and the approved samples shall thereafter be regarded as the standard for the work. Ironmongery which in the opinion of the Architect does not conform to this standard shall be removed from the site.
- (ii) Alternatively, ironmongery of an equal standard will be acceptable providing samples are submitted to and approved by the Architect before orders for such ironmongery are placed.

METAL WORK**A. ALL MATERIALS**

Shall be of the best quality, free from defects. The materials in all stages of transportation, handling and piling shall be kept clean and injury from breaking, bending and distortion prevented.

B. NAILS, SCREWS AND BOLTS

Shall be of the best quality mild steel of lengths and weight approved by the Architect. Nails shall be to B.S. 1202 and bolt to B.S. 916.

C. WORKMANSHIP

All work shall be carried out in the most workmanlike manner and strictly as directed by the Architect.

Welding shall be neatly cleaned off and units shall be prefabricated in the workshop wherever possible, the minimum of site welding being employed.

All screwed work shall have full internal and external threads and holes shall have been cleaned off. Counter sinkings must be concentric.

D. NACO LOUVRES

Shall be of steel, aluminium-lacquered, single control type, unless otherwise described, carefully screwed into timber sub-frames or plugged and screwed to walling. Louvers of equal quality of other manufacture may be substituted on approval.

Prices shall include for oiling and adjusting and leaving clean and undamaged on completion.

E. MILD STEEL

For burglar bars and reinforcement shall comply with B.S. 19 No. work shall be fabricated until the site dimensions have been checked and no additional claim will be accepted should final dimension differ from these on the drawings.

All welds shall be ground smooth and the contractor shall ensure that the metalwork is prepared for painting as described in painting and decorating.

The contractor is to ensure that all work is erected plumb and true and be so maintained until properly secured by permanent fixings.

A. PAINTING

All steel is to be wire brushed and any loose scale, dirt or grease shall be removed before any painting is commenced. One coat of red oxide primer type A to B.S 2523 shall be applied at the shop.

Any damage to the priming paint shall be made good to the Architect's satisfaction.

B. MATERIALS GENERALLY**(i) MATERIALS**

Specified in this section may be applicable to any or all the subsequent sub trades in metalwork.

(ii) SUPPLIERS

Obtain all materials from suppliers approved by the Engineers.

(iii) STANDARDS

Produce the manufacturer's certificate of compliance with the standards specified if so requested by the Engineer.

(iv) FINISHES

Metal commodities for making components must be either pre-finished or suitable to receive the finishes specified.

C. SECTION ETC.**(i) HOT ROLLED STEEL SECTIONS**

Except equal and unequal angles: to B.S. 4: part 1, made from steel to B.S.4360 part 2.

(ii) HOT ROLLED EQUAL AND UNEQUAL ANGLES

Part 1 (metric converted from imperial dimensions) or to B.S 4848: part 4 accordinated metric dimensions. Do not substitute sections or dimensions other than those specified without the prior approval of the Engineer.

SECTION ETC., (CONT'D)(iii) HOT ROLLED HOLLOW STEEL SECTIONS

Part 2, made from steel to B.S 4360: part 2.

(iv) HOT ROLLED STEEL BARS

To B.S. 4449.

(v) COLD ROLLED STEEL SECTION

To B.S 2994, made from steel to B.S. 1449: part 1 B (HR, CR, HS, OR CS) quality unless otherwise specified or shown on the drawings).

(vi) STEEL TUBES AND TUBULARS

To B.S. 1387 medium thickness unless otherwise specified. If steel tubes to B.S. 1775 are required they will be specified or shown on the drawings.

(vii) STAINLESS STEEL TUBES

To B.S. 3014, welded unless otherwise specified.

(viii) COPPER AND ALUMINUM ALLOYS

If the alloy is not specified or stated on the drawings, it is to be suitable for the application.

(ix) ALUMINUM ALLOY BARS, TUBES AND SECTIONS

To B.S. 1161 AND B.S 1474.

(x) COPPER AND COPPER ALLOY RODS AND SECTIONS

To B.S. 2874

(xi) COPPER AND COPPER ALLOY TUBES

To B.S. 2871: part 2

(xii) TIMBER FOR CORES OF DRAWN SECTIONS

To B.S. 1186: part 1, concealed surfaces class, straight grained ofmahogany or other approved hardwood.

A. MESH

(i) STEEL MESH FABRIC

To B.S. welded type, and square, structural or long mesh as specified orshown on the drawing.

(ii) MOSQUITO MESH

Approved fine wire mesh or gauze of non-corroding metal, for examplealuminium.

B. PLATE SHEET AND STRIP

(i) STEEL PLATE

For welding to B.S. 4360, section 2 unless otherwise specified. Steel to this standard is equally suitable for bolting and riveting, and may be used unless steel plate to B.S. 1449 is specified.

PAVINGS AND PLASTERWORK**A. GENERALLY.**

- (i) Prices for paving shall include for preparation of concrete floor and painting with cement grout as described, and any extra thickness consequent upon the floor not being finished to the true levels and also for all temporary rules and for all formwork to stop pavings at openings and edges as required. Prices for tile and similar paving shall include for any pointing to exposed edges.
- (ii) Plastering to walls has been measured over concrete columns, lintols, etc., flush with wall face, and prices for plastering shall include for hacking concrete or for raking out joints to form key, and for any necessary rubbing out.
- (iii) Prices of superficial items of paving and plastering are to include for narrow widths and small quantities, fair edges and arises, rounded external angles up to 10mm. radius, making good to metal windows or door frames and making good around pipes, holder bats, and other metalwork and for all similar incidental labours unless specifically measured.
- (iv) Prices of lineal items are to include for all short lengths, angles, arises, mitres, ends and the like and for all necessary rubbing out.
- (v) Prices for floor or wall tiling shall include for all straight cutting and waste, small quantities and narrow widths.

B. CEMENT

Cement shall be described in "Concrete Work".

C. SAND

Sand shall be as described in "Masonry and Block work".

D. LIME

Lime and treatment before use shall be as described in "Masonry and Blockwork" except that it shall comply with B.S. 890, Class 'A'.

E. WATERPROOFING COMPOUNDS

All waterproofing compounds are to be to the Architects' approval and used strictly in accordance with the manufacturer's printed directions.

A. PAVING

All materials for paving and plastering must be measured in proper gauge boxes in the proportions specified and mixed on clean wood or iron platforms and turned over at least three times dry until the mix is of a uniform colour. Water shall then be added by means of a rose nozzle and the materials again turned over until the mass is thoroughly mixed with water. Alternatively, mechanical mixing methods may be used to obtain the same result as approved by the Architect.

B. PREPARATION FOR PAVING AND SCREEDS

As soon as the paving has set sufficiently, it is to be covered with a well wetted layer of sawdust, hessian or other approved material and this layer is to be kept damp for at least seven days during which period no traffic is to be allowed over paving. When no longer required as a protection to the surface, the materials is to be removed the paving left clean and perfect.

All paving shall be laid with joints coinciding with the construction joints in the concrete beds upon which they are laid and the pattern set out accordingly.

C. VERMICULITE ROOF SCREEDS

Vermiculite screeds are to be mixed in the proportions of 250 kgs. Pozzolana cement to 1 cubic metre Vermiculite Grade 5, all in strict accordance with the Manufacturer's printed instructions. The screed is to be finished with 10 mm cement and sand (1:3), trowelled smooth to receive roof finish as previously specified. No vermiculite is to be laid in rainy weather and screeds are not to be walked on for three days after lying.

D. SCREEDS TO RECEIVE FLOOR AND WALL FINISHES

There are to be laid true and level, particular care being taken to obtain a perfectly smooth surface to receive P.V.C and similar floor finishings.

E. CEMENT AND SAND PAVINGS

To be in cement and sand (1:4) and finished perfectly smooth with a steel trowel.

E. SKIRTINGS

Skirtings to cement paved floors shall be in cement and sand (1:4) to match the paving, with rounded arries and 38 mm radius cove at junction with paving.

PAVINGS AND PLASTERWORK (CONT'D)**A. JUNCTION STRIPS**

At the junction of differing floor finishings fix in position 3mm x 25mm plastic jointing strips cut to lengths, bedded in and finished flush with pavings. All plastic jointing strips shall be black in colour.

B. FLOOR HARDENER

Treat the surface where specified with three coats of sodium silicate or other equal and approved hardener in accordance with the manufacturer's instructions.

C. P.V.C. FLOORING

Dunlop Vinylex asbestos floor tiles to B.S 3261 of thickness specified and colours selected by the Architect and executed by approved sub-contractor. Upon completion the flooring is to receive two coats of approved polish.

D. GRANOLITHIC AND TERRAZZO PAVING AND WALL FINISHES**(a) GENERALLY**

- (i) Construction joints between bays of paving are to be straight and vertical and are to coincide as far as possible, with those in the concrete under.
- (ii) After spreading and before finally striking to screen levels the pavings etc., are to be lightly tamped each stage of laying operation is to be properly carried out at the optimum degree of stiffness of the mix so that the aggregate remains correctly distributed throughout the pavings etc., and so finished that the surface is true to level, dense, smooth and free of laitance and other defects and blemishes. The use of dry cement or sand to absorb surplus moisture will not be allowed.
- (iii) The thickness of the pavings etc., in these Bills of Quantities include for the combine screed or backing and granolithic or terrazzo finish.
- (iv) All granolithic and terrazzo finishings shall be divided into areas not exceeding 3 square metres with dividing strips as specified.

GRANOLITHIC AND TERRAZZO PAVING AND WALL FINISHES (CONT'D)**(b) SCREED AND BACKING**

To be in cement and sand (1:4).

(c) GRANOLITHIC

- (i) To be composed by volume of one part of cement, one part of sand and two parts 6mm blackstrap chippings free of dust, laid or applied to screeds or backings whilst they are still green.
- (ii) Paving shall be 25mm minimum combined thickness comprising 15mm thick cement and sand (1:4) backing and 10mm. thick granolithic.
- (iii) Dadoes shall be 20mm minimum combined thickness comprising 12mm thick cement and sand (1:4) backing and 8mm thick granolithic.
- (iv) Polished granolithic to be finished with a metal roller and all surplus cement lightly brushed off when surface is sufficiently hard to resist dislodgement of aggregate, when the surface is hard enough it shall be wet ground, using a machine, until the aggregate is uniformly revealed and then well washed with clean water. Any small voids or holes left in the surface are to be filled with cement grout rubbed down-by hand. Mouldings etc. not accessible to machines are to be hand rubbed and polished with carborundum. After an interval of 1 to 3 days the surface is to be finally machine ground using the fine abrasive.

(d) TERRAZZO

- (i) To be composed of one part of "Snowcrete" "Colourcrete" or other equal and approved white or coloured cement to two parts of clean imported marble chippings well washed and free from dust. The marble chipping may vary in colour and from 3mm to 9mm dependent on the effect required and sample areas must be prepared for Architects' approval.
- (ii) Pavings to be 25mm minimum thickness overall. As for granolithic (ii) preceding.
- (iii) Polished terrazzo to be finished as granolithic (iv) preceding.

A. PLASTIC DIVIDING STRIP

To be 3mm x 25mm strip set in position before paving is commenced, and embedded straight and true.

B. PLASTERING GENERALLY

- (i) 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 arises 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.

- (ii) 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.
- (iii) 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 dove-tailed key, and all finished flush with face of surrounding plaster or rendering.

C. INTERNAL OR EXTERNAL CEMENT AND SAND RENDER

Plaster described as internal cement and sand (1:4) render or external cement and sand (1:4) render shall be executed in two coats and be composed of one part cement to four parts sand. The first coat shall be laid to a uniform surface finished with wood float well scored and allowed to dry out for at least 7 days before applying the finishing coat. The second or finishing coat shall be thoroughly worked and finished hard and true with a steel trowel or wood float as specified hereinafter. The total finished thickness of plaster shall be not less than 12mm thick.

A. INTERNAL GAUGED PLASTER

Plaster described as “Internal gauged plaster in two coats” shall consist of a first or rendering coat composed of one part cement, two parts lime and nine parts sand and a finishing coat composed of one part cement, three parts lime and six parts sand. Application and thickness will be as for last item.

B. GLAZED WALL TILING

- (i) Glazed wall tiles shall be 150 x 150 x 6mm thick cushion and tiles with matching fittings, all conforming to B.S 1281 in colours specified by the Architects.
- (ii) Tiles are to be bedded in “Richafix” or other equal and approved tile fixing compound applied strictly in accordance with the manufacturer’s printed instructions.
- (iii) Walls are to be dry before tiles are fixed and tiles are not to be soaked in water before use. Tiling is to be set and closely straight jointed with 1.5mm joints. If non-lu tiles are used, cardboard or plastic spacer pieces are to be used to obtain constant joint width. On completion tiling is to be pointed in white or coloured cement and cleaned down.

C. EXPANDED POLYSTYRENE PANELS

- (i) All Expanded Polystyrene Panels (EPS) to floors and walls together with steel meshes for the works to be sourced from the National Housing Corporation factory located in Mavoko-Machakos County

Specifications for shotcrete application (1:2:4) to the EPS panels consists of 1 part cement, 2 parts sand and 4 parts rock sand/quarry dust. The shotcrete shall be applied to the panels using a spray gun or similar equipment for uniform application.

GLAZING**A. GENERALLY**

- (i) Glass for glazing and mirrors shall be of approved manufacture and is to comply with B.S. 952 in all respects, free from flaws, bubbles, specks and other imperfections.
- (ii) Each pane of glass where its dimensions contain fractions of centimetre above both in width and height. Louver blades have been similarly measured in regard to length.
- (iii) Prices for glazing shall include for back-puttying, fixing glazing clips of springing as required, cutting glass to sizes, cleaning all glass inside and out, removing all paint and putty marks, replacing any broken, scratched or cracked panes and leaving all glazing sound and perfect at completion.

B. CLEAR SHEET GLASS

Clear sheet glass shall be Ordinary Glazing (Q.Q) quality.

C. POLISHED PLATE GLASS

Polished plate and Georgian wired polished plate to be General Glazing (G.Q) quality.

D. OBSCURED GLASS

To be of the types described and as approved by the Architects.

E. MIRRORS

To be S.Q quality plate glass mirrors of approved manufacture with bevelled edges and fixed at all corners to walls with rawlplugs and brass screws with removable chromium-plate dome heads.

F. PUTTY

- (i) The putty for glazing to metal windows is to be gold size metal window putty specially designed for tropical use, all as B.S 544 (Type 2 putty) or patent mastic putty as approved by the Architect.
- (ii) All putty shall be delivered on site in the original manufacturer's sealed cans or drums and used direct there from, with the addition only of pure linseed oil if necessary. No mineral or other oils may be used in the putties except genuine linseed oil.

A. GLAZING

- (i) Glass panes shall be cut to sizes to fit the openings with more than 1.5mm play round.
- (ii) The rebates of all windows shall be painted one coat before puttying.
- (iii) All glass, where fixed with putty, is to be back and front puttied and care must be taken to ensure that putty does not project beyond the sight lines of panes and is to be neatly mitred at angles.
- (iv) Putty which has not set hard within seven days must be removed and the glass re-putted at the contractor's expense.
- (v) Allow for removing all cracked or broken panes of glass, cleaning rebates and re-glazing with new glass throughout the progress of the works and for cleaning all glass on both sides and leaving perfect upon completion.

B. BEDDING STRIPS

Wash-leather, velvet, etc., bedding strip to edges of glass is to be sufficient width to be turned over 6mm to each side of pane and shall be trimmed to the sight lines of the pane.

PAINTING**A. GENERALLY**

- (i) Prices must include for rubbing down with glass paper between successive coats and all cutting in at edge.
- (ii) Prices shall include for all work in parti-colours and all cuttings to line.

B. MATERIALS

- (i) Paints shall be obtained from M/s Crown Berger Kenya Ltd., Basco Products Kenya Ltd or any other manufacturers approved by the Architect.
- (ii) The materials for all other finishes shall be of the best quality available of approved manufacture.
- (iii) Before commencing painting, the Contractor shall submit to the Architect for approval a list of all the brands of paints and finishings including the necessary primers and undercoats he intends to use and immediately upon being so approved, orders shall be placed and total requirements obtained for the works.
- (iv) Once approved, no other brand of material shall be used without the express permission of the Architect, in writing.

C. MORDANT SOLUTION

All galvanised metal work to be painted shall first receive a coat of a propriety mordant solution, approved by the Architect as suitable for this purpose.

D. KNOTTING

To be 'Shellack' knotting to B.S 1336.

E. STOPPING

To be composed of linseed oil putty, white lead, red lead and gold size suitable proportioned and mixed.

F. POLYURETHENE

To be "Ronseal" polyurethane or other equal approved by the Architect.

G. WAX POLISH

Wash polish is to be furniture polish of an approved proprietary brand.

A. DELIVERY OF PAINTS TO SITE

- (i) All paints etc., shall be delivered on site in the original drums or tins, and shall be mixed and applied strictly in accordance with the manufacturer's printed directions. The only addition which will be allowed to be made will be liquid thinners, driers etc., supplied by the makers for the purpose. No paint, distemper, etc., shall be thinned more than approved by the Architect.
- (ii) Paint for external work shall be of the special quality recommended by the manufacturers for external use.

B. GENERAL WORKMANSHIP

- (i) The priming, undercoats and finishing coats shall each one be of different tints and the priming and undercoats shall be the correct brands and tints to suit the respective finishing coats, all in accordance with the manufacturer's directions.
- (ii) All surfaces must be thoroughly cleaned down previous to painting and decoration work and no external painting may be done in rainy weather. All paint must be thoroughly well worked on and excess of paint in any coat must be avoided.
- (iii) All brushes, tools and receptacles are to be kept clean and free from dirt or old paint and are to be thoroughly cleaned each time after use.
- (iv) Each coat is to be well brushed into the surface so that every part, including joints, angles etc., is adequately covered, but care is to be taken to avoid excessive or uneven thickness of paint film, particularly at edges and in angles, etc.
- (v) Each coat of paint etc., shall be properly dry and shall be well rubbed down with fine sandpaper and be brushed clean before the next coat is applied. The paintwork shall be finished smooth and free from brush marks.
- (vi) Where so required or directed, painting shall be in parti-coloured and picked out and cut in and the prices shall include for this.

GENERAL WORKMANSHIP (CONT'D)

- (vii) All ironmongery, metal or plastic plates and electrical outlet plates and fitting and the like shall be removed before painting is commenced, and re-fixed on the completion of the work.
- (viii) No sprays or roller painting will be allowed unless permission is give by the Architect.
- (ix) The contractor shall so arrange his programme of work that all other trades are completed and away from the area to be painted when painting begins.

A. SAMPLES AND COLOURS

All colours will be selected by he Architect from the B.S range of colours. Samples and colour cards of all paints, distemper, and materials shall be submitted for approval of the Architect before the same are applied and sample panels shall be executed for the Architect's approval where directed. Such samples when approved shall become the standard for the work.

B. PREPARATION AND PRIMING OF PAINTED SURFACES**(a) PLASTERED AND RENDERED SURFACES**

- (i) Plastered surfaces are to be perfectly smooth, free from defect and ready for decorations. All such surfaces shall be allowed to dry for a minimum period of four weeks and rubbed down with No.2 grade sandpaper to remove trowel marks stains, etc. After the priming coat, all cracks and imperfections are to be made good with 'Polyfilla' (or a similar approved hard filler), well rubbed down and then touched up with the priming coat.
- (ii) Priming for plastic emulsion paint shall be the paint thinned with 25 percent water.
- (iii) Priming for oil paint shall be with alkali-resistant primer.

(b) HARDBOARD SURFACES

- (i) Priming for plastic emulsion paint shall be the paint thinned with 25 per cent water.
- (ii) Priming for oil paint shall be with a thin oil primer.

PREPARATION AND PRIMING OF PAINTED SURFACES (CONT'D)**(c) FERROUS METALWORK**

All surfaces shall be thoroughly brushed down with wire brushes to remove all scale, rust, etc., and rubbed down with No.2 Grade sandpaper and brushed and left perfectly clean immediately prior to decoration

- (i) Shop-Primed: Surface to receive oil paint shall have all bare places touched up with approved metal zinc chromate primer.
- (ii) Unprimed: Surface shall be given one coat of primer as last.
- (iii) Galvanised: Surface shall be treated before painting with mordant solution. The surfaces shall then be thoroughly washed down with clean water, allowed to dry and primed as last.
- (iv) Coated: Surfaces already treated with bituminous solution shall receive an insulating coat of anti-bitumen primer or 'Shellac' knotting.

(d) WOOD SURFACES TO RECEIVE PAINT

- (i) The woodwork shall have all knots or resinous parts carefully treated with self-knotting aluminium primer. All cracks, nails, or other holes shall be thoroughly cleaned out and after priming all such cracks etc., are to be filled with matching hard stopping which is to be rubbed down flush with the adjoining surface.
- (ii) Priming for oil paint shall be self-knotting aluminium primer.
- (iii) The back of all joinery work is to be primed before fixing.

PAINTING (CONT'D)**A. PREPARATION, PRIMING ETC., OF CLEAR TREATED WOOD SURFACE**

All wood surfaces to receive clear treatment shall be rubbed down to a stain finish with fine sandpaper immediately prior to application.

B. COVERING UP

All floors etc., shall be covered up with dust sheets when executing all painting and decorating work.

C. DELIVER UP CLEAN

Paint splashes, spots and stains, shall be removed from floors, woodwork, etc. Any damaged surfaces shall be toughed up and the whole of the work left clean and perfect upon completion.

PAINTING

ROAD WORKS**A GENERALLY**

The Specification of work and materials in this section, which repeat similar work in preceding sections, shall be deemed to the full specification of work and materials contained in the preceding Bills.

ACCESS ROADS AND CAR PARKS**B EXCAVATION**

Excavation shall be to levels approved by the Architect. All soft spots are to be excavated and filled with approved filling thoroughly compacted.

C FALLS

Roads and car parks shall have a minimum fall of 1 in 40. The actual falls will be decided by the Architects on Site.

D COMPACTION OF FORMATION

The maximum dry density of the soils to be compacted shall be determined by Test 9 as described in B.S. 1377/49.

The dry density of the soil in the field shall be determined by Test 10 as described in B.S. 1377/49.

The relative compaction of the formation shall be determined by the percentage ratio of the dry density in the field (Test 10) to the maximum dry density (Test 9).

The relative compaction of the formation is to be not less than 100% when compacted at optimum moisture content plus or minus 2%. Water shall be used as necessary to achieve the desired moisture content.

E. COMPACTION ON SUB-BASE

The murrum sub-base shall be built up in layers as described hereafter, each layer shall be compacted at B.S. optimum moisture content plus or minus 2% until relative compaction is obtained of 95% for the lower layer and 102% for the top layer. Water shall be used as necessary to achieve the desired moisture content.

EXTERNAL WORKS (CONT'D)**A MURRAM SUB-BASE**

The murram shall be approved clean, hard, dark coloured; Imported murram free from all vegetable matter, clay or other deleterious substances and obtained from an approved source.

The murram sub-base shall be 150mm, Thick (finished) laid in two layers to the required compaction as described herein to form on completion a firm dense surface.

The material shall meet the following specification: -

- (i) Maximum size 63mm
- (ii) Plasticity index maximum 15%
- (iii) CBR at 95% MDD [AASHTO T180] and 4 days soak minimum 30%

B. HAND PACKED STONE BASE MATERIAL

The rock from which the stone and screenings are to be produced shall comply with the following:-

ACV:	not greater than 40%
LAA:	not greater than 60%
SSS:	loss on 5 cycles to be not more than 12%

The stones shall be free from an excess of flat or elongated particles, soft and less durable rock, clays, loam, top soil and other deleterious matter. The larger stones shall have a maximum dimension slightly greater than the thickness of the required compacted layer and be of a shape acceptable to the Engineer. The smaller stones shall have a reasonably uniform grading and be of a nominal size suitable, in the opinion of the Engineer, for filling the surface voids of the as placed larger stones. The nominal size will be of the order of 50 mm (2").

The screenings shall consist of tough durable crushed rock, free from an excess of flat, elongated, soft or disintegrated pieces and harmful material, such as loam, clay, organic matter, or other deleterious substances and shall be to the Engineer's approval. The grading of the screenings shall form a smooth curve and shall be within, and approximately parallel to, the following grading limits: -

BS Sieve Size	Percentage by Weight PassingBS Sieves
3/8 "	100
3/16"	85 – 100
No. 36	30 – 50
No. 100	10 – 30
No. 200	0 – 20

Sandy soil which may, with the approval of the Engineer, be added to the screenings or used in lieu of the screenings, shall comply with the following requirements:-

- (i) It shall consist mainly of sand sizes and have a reasonable smooth grading.
- (ii) The fraction passing No. 200 sieve shall be less than half the weight passing No. 36 sieve.
- (iii) PI shall not be greater than 5%.

STOCKPILING MATERIAL

The site of the stockpile shall be levelled, graded and drained, all vegetation removed and if necessary, the area shall be surfaced with murrum or other material as directed by the Engineer. Each category of material shall be stockpiled separately and not intermingled with each other or any other material.

PLACEMENT OF STONE FOR HANDPACKED STONE BASE

On the prepared area, the pitching stone shall first be laid, each individual stone being positioned by hand, closely packed with the greatest dimension vertical, and the largest and flattest and downwards. The majority of the stones will be slightly higher than the final thickness of layer required. When an area has been covered in this way a second placing of stones of smaller size, keystone, shall be positioned in the spaces between those first placed and shall be wedged home by hammering. The points of pitching stone projecting beyond the required height shall then be knapped, and a third placing of stone shall follow the second and so on until in the opinion of the Engineer the voids are sufficiently filled to permit compaction. No handpicked stone layer of greater compaction thickness than 230 mm shall be laid.

COMPACTION AND SLUSHING

After placement of the stone in the specified manner the material shall be initially compacted with a heavy smooth steel-wheeled roller, weighing not less than 12 tonne and/or vibratory roller, and shall continue until the layer is thoroughly keyed, showing virtually no movement under or ahead of the roller.

All rolling shall be longitudinal and shall commence at the outer edges of the road, and progress towards the centre of the road except that on super-elevated curves, rolling may progress from the lower to the higher edge.

The irregularities that may show up during compaction shall be corrected by loosening the surface removing or adding material as may be required, and recompacting.

After the stone has been rolled and keyed, binder material, where necessary, shall be spread dry in thin layers and broomed into the interstices and dry rolling continued with approved vibratory and smooth swivel-wheeled rollers until no more binding material will go in.

The layer shall then be saturated with water slashed and compacted with a smooth-steel-wheeled roller weighing not less than 12 tonnes. This rolling and slashing, with the addition of more binder material where necessary shall continue until all surface voids are filled and there is no visible movement under the roller.

All surplus fines shall be brushed off to expose a closely knit compact mosaic of stones as the finished surface of the layer.

TOLERANCES FOR HANDPACKED STONE BASE

The following tolerances shall apply to the hand packed stone basecourse:-

Thickness	3m Straight Edge	<u>Width</u>
+ 10 mm - 0 mm	+ 6 mm - 6 mm	+ 150 mm - 0 mm

MEASUREMENT AND PAYMENT FOR HANDPACKEDSTONE BASE

The hand packed stone base material will be paid for per cubic metre of material measured in place upon the road. The volume of material shall be calculated as the product of the compacted thickness specified or ordered by the Engineer and the net area requiring to be laid. The rate shall be the full inclusive price for providing spreading and compacting the material.

A. PRIMING COAT

The priming coat shall consist of Grade MC 30. Medium curing cutback bitumen or emulsion as directed by the Engineer.

Priming shall not commence until all loose fines, superficial films and foreign material have been removed from the surface of the base by sweeping with mechanical or hard hand broom. The prepared base shall be watered, if necessary, in order to ensure that the surface is damp when the prime coat is being applied. Care shall be taken not to cause free water to lie on the surface.

On the properly cleaned and prepared base, the MC 30 cut back bitumen shall be applied at a temperature of 43°C, and at a rate of 1 litre per square metre by means of a pressure distributor. The prime coat shall be applied over the full width of the base and shall be left undisturbed for a period of not less than two (2) days and preferably until complete absorption has taken place and the applied prime coat has dried off thoroughly. Any excess prime remaining on the surface shall be blotted with crusher fines or sand.

After the primer has been applied the surface of the base shall be checked for smoothness and accuracy of elevation, grade and cross-section and any irregularities or inaccuracies shall be corrected by filling in or surfacing with premixed bituminous material and compacting until specified requirements are obtained to the satisfaction of the Architect, all at the Contractor's expense.

PREMIX SURFACING**A. PREMIX WEARING COURSE**

- .01 The Term “Premix” shall mean mixture of dried, hot aggregate of pre-determined grading and hot straight run bitumen in pre-determined quantity to give adequate strength and stability and shall apply both to the mix and the compacted layer on the road.
- .02 The actual quantity of binder and the aggregate used in various proportions shall be determined by laboratory tests and trial mixes.
- .03 The Contractor shall be responsible for the design of the mix and shall provide the design information to the Engineer together with sample sections on the site based on the designed proportions of the aggregate and binder to the Engineer’s approval.
- .04 Once the design mix has been approved it shall not be varied by the Contractor without written authority of the Engineer.
- .05 Notwithstanding the Engineer’s approval the Contractor shall be responsible for compliance with the provisions of this Specification.
- .06 The Materials used shall comply with the following requirements: -

.01 BITUMEN GRADE 80/100**.02 COARSE AGGREGATE**

- .01 Los Angeles Abrasion – Max. 35
- .02 Aggregate Crushing Value – Max 28
- .03 Sodium Sulphate Soundness – Max 12

.03 FINE AGGREGATE

- .01 Sand equivalent min. 40.
- .02 Sodium Sulphate Soundness max 12.

.04 MINERAL FILLER

.01 Shall be cement, lime, limestone or other mineral matter and
shall be NON-PLASTIC

.05 GRADING

- .01 Passing 0.425mm 100%
- .02 Passing 0.075mm 75%

.06 GRADING

The mix grading shall comply with the table below:-

Sieve Size	Percentage by Weight Passing
14	100
10	90 – 100
6.3	62 – 92
4	50 – 80
2	35 – 65
1	25 – 50
0.425	14 – 33
0.300	11 – 27
0.150	6 – 17
0.075	3 – 8

.07 PREMIX WEARING COURSE

.07 Asphalt Mix

The mix shall comply with the following table: -

Test	Result Required
.01 Crushing Ratio	60 – 100%
.02 Marshall Stability (N) (Test ASTM, D 1559)	5000 – 9000
.03 Flow (mm)	2 – 5
.04 Voids in total mix (%)	3 – 5

- .08 Mixing shall be carried out in an approved stationary plant at controlled temperatures (125-165°C) as follows:-

.01 The materials shall be mixed in such a manner that on discharge from the mixer the mixture is uniform in composition and all particles of the aggregate are completely coated. The mixing time shall be the minimum to ensure such coating and shall not exceed 90 secs. From the addition of the bitumen.

- .09 When permitted by the Engineer, soil binder material may be added to screenings or used in lieu of screenings, provided it complies with the following requirements:-

- .01 The fraction passing BS sieve No. 200 shall be less than half that passing No. 36 sieve.
- .02 The plasticity index shall be not greater than 8 and preferably not greater than 5.

.10 **MURRAM (GRAVEL) FOR SUB-BASE MATERIAL**

.01 Where murram is specified for sub-base construction, naturally occurring lateritic gravel or decomposed stone and coral shall be used. The material may be in either a loose or cemented to an acceptable size on the roadbed during consolidation. The proportion of clay in the material must not be excessive and test results for the grading of the material and the Attenburg Limits must be produced by the Contractor prior to any material being delivered to site.

A. MANUFACTURE AND LAYING

The premix shall be manufactured in an approved plant and shall, where required by the Architect be laid by means of an approved paving machinesuch as a Bylaw-Knox or Barber-Green type paver, or otherwise shall be laid in an approved manner.

B. BITUMEN

The bitumen used in the premix shall be straight-run bitumen as follows: -

Base Course	-	80	-	100
Penetration				
Wearing Course	-	80 – 100		
Penetration				

The bitumen shall be from an approved source delivered in sealed drumsand opened with care to ensure cleanliness.

.10 BITUMEN AND BITUMEN EMULSIONS

.01 Before any bitumen or bitumen emulsion is delivered to the site, the Contractor shall provide the Engineer with a certificate from themanufacturer that the material to be supplied complies in all respects to the relevant specification given or referred to hereinafter.

.02 Any bitumen or bitumen emulsion delivered in leaking containers or deteriorated containers may be rejected. The types of bitumen binders required will normally be as follows:-

.01 Prime Coat

On stone base course	(R.C. 30 or MC 30)
On stabilized base course	(Alternatively R.C. Or MC 1)

A. AGGREGATE

The aggregate shall be blackstrap, hard, dense stone free from dust, impurities or a mixture of softer stone. Before commencing manufacture the Contractor must submit to the Architect samples of all sizes of stone he proposes to use and these, when approved, shall form the standard for the work. If the samples are rejected, the Contractor shall be responsible for providing samples from alternative sources.

B. BASE COURSE

The base course premix shall be of the specified thickness after consolidation of crushed blackstrap aggregate with 80 – 100 penetration straight run bitumen and approved filler.

The grading shall comply with Table 2 of B.S. 1621. The soluble bitumen binder minimum shall be raised from 3.0% to 3.5%.

C. WEARING COURSE

The wearing course premix shall be of the specified thickness after consolidation of crushed black trap aggregate with 80 – 100 penetration straight run bitumen and approved filler.

The grading complies with Table 5 of B.S. 1621.

The finish surface shall be to the required gradients and cambers and shall be well rolled and neatly finished off at all curbs, walls, drainage galleys etc., to the approval of the Architect.

D. CONCRETE KERBS

The rates entered by the Tenderer in Bills of Quantities for the provision and placing of precast concrete kerbs shall include for all necessary concrete bedding and haunching, and all necessary shuttering all in accordance with the specification and the drawings.

Concrete kerbs shall comply with B.S. 340 (Figure 7) for 250 x 125mm splayed, plain or circled kerbs.

Kerbs will be set on concrete (1:3:6) foundations size 225mm wide x 100mm thick and a 100mm thick x 200mm high haunching behind.

Kerbs to be bedded, jointed and pointed in cement mortar (1:3) and to be laid true to line, perfectly level or to even gradients and to be free from all chips, cracks, blemishes and cement stains at joints.

A. WORKMANSHIP

Excavation in Trench for Pipe Culverts, Headwalls and Wing walls

.01 Trenches for culverts, headwalls, wing walls shall be excavated to line and depths shown on the drawings or as directed by the Engineer and shall be of sufficient width to give working clearance in the trench but for the purpose of measurement and payment, the width of the trench shall be taken as 1.5D where D is the outside measurement of the pipe. Backfilling of trenches around culverts shall be done to a density of 100% BS Compaction. Excavation for inlet and outfall drains, catch water drains and trench or subsoil drains shall be to the dimensions ordered by the Engineer.

B. GROUTED STONE PITCHING

- .01 The stones used for the grouted pitching shall be hard angular rock, roughly cubical in shape and of dimensions such that they can be laid with a minimum thickness equal to that specified.
- .02 The interstices of the grouted pitching shall not be filled with fill material but may be choked with large rock spalls. The pitching shall be thoroughly soaked with water and grout of 1:4 cement: sand mortar shall be rammed into the interstices and smoothed off flush with the pitched face.
- .03 Grouted pitching to embankments and around structures shall be constructed as soon as possible after the embankments have been built. The surface of the filling to receive the pitching shall be compacted and trimmed to slope and the stone hand laid interlocked and rammed.

CONCRETE PAVING BLOCK

A. SCOPE

Concrete paving blocks shall comply with the requirements of the Specification for precast concrete paving blocks published jointly by the Cement and Concrete Association, the County Surveyor's Society and Interpave, September 190 (or as amended by subsequent British Standards).

B. CONSTRUCTIONAL DETAILS

LAYING PATTERN

The laying pattern shall be that specified for vehicular traffic or the herringbone type.

SURFACE LEVELS OF PAVEMENTS

The following levels shall apply to the various layers of concrete block pavements.

Layer	Tolerance
Formation	+20 mm – 30 mm
Sub-base	+20 mm
Road base (where required)	+15 mm
Pavement Surface (except adjacent to gullies)	+6 mm

Surface levels of Paving Blocks Adjacent to Drainage Installations

The surface levels of paving blocks immediately adjacent to gullies, surface drainage channels and outlets shall not deviate from the design level by more than +6mm, -0mm and on the upper level of drainage installation +0mm, -10mm.

C. DEVIATION FROM DESIGN PROFILE

The deviation from the design profile measured under a 3m straight edge shall not exceed 10 mm.

A. LEVELS OF ADJACENT BLOCKS

Levels of any two adjacent blocks shall not differ by more than 2 mm.

B. CROSSFALLS AND GRADIENTS

A minimum cross fall of 2.5% shall be adopted where practicable. Longitudinal gradients shall not be less than 1%.

C. PAVEMENT CONSTRUCTION**Preparation of Sub-grade**

The sub grade shall be prepared to the required formation and shall be sufficiently wide to extend to the near face of the proposed edge restraint and around existing structures. The sub-grade shall be drained and protected against inundation and ground water by piped or channelled storm water drainage and sub soil drainage. All drainage works located beneath the

Pavement shall be completed in conjunction with sub-grade preparation before commencement of sub-base construction. Any unsuitable material shall be removed from the sub-grade and treated or replaced with suitable material properly compacted.

D. PREPARATION OF SUB-BASE**New Sub-base**

Sub-bases shall be constructed by following construction requirements and using one or other of the materials complying with Department of Transport Specification for Road and Bridge Works as listed below: -

Granular sub-base materials type 1
Soil-Cement
Cement-bound granular material
Lean Concrete
Wet mix macadam
Wet lean concrete.

When no road base is to be laid, the surface of the sub-base shall be close-knit to prevent laying course material from sinking.

A. EXISTING SUB-BASE

Where an existing sub-base is to be used, it shall be inspected to ensure that it is suitable for the purpose. Any unsuitable material shall be removed and replaced by sub-base material complying with the requirements of Clause 1201.2.1.

B. PREPARATION OF ROAD-BASE

When a road base is required, it shall be formed with materials described in the Department of Transport Specification for Road and Bridge Works and constructed in accordance with that Specification, e.g.

Soil-cement

Cement bound granular materialLean concrete

Wet mix macadamWet lean concrete

C. LAYING COURSE MATERIAL

The laying course shall be of uniform thickness and shall be made up of naturally occurring sand or crushed rock fines. The material shall be free from deleterious salts or contaminants. The grading shall be within and approximately parallel to the following grading limits.

BS Sieve Size	Percentage of Weight Passing
5.00 mm	90 – 100
2.36 mm	75 – 100
1.18 mm	55 – 90
0.60 mm	35 – 59
0.30 mm	8 – 30
0.15 mm	0 – 10

D. MOISTURE CONTENT OF LAYING COURSE

The moisture content of the laying course material shall not deviate by more than 1% from its optimum moisture content as determined in accordance with test 12 of BS 1377.

A. SCREEDING THE LAYING COURSE

The laying course shall be such that after compaction it forms a uniform layer 25mm below the blocks. It may be screed in accordance with the following two methods:-

Either

- (a) The material shall be spread loose in a uniform layer and screed to a thickness required to give a nominal 25 mm layer after completion of the paving.

Or

The material shall be spread in loose uncompacted layer approximately two thirds of the required final thickness. This layer shall be lightly compacted by means of a vibrating plate compactor. A further layer of loose material shall be spread and screeded to create a loose surface onto which the blocks can be placed.

Where closer tolerance than those quoted in Clause 1201.2 for the level of the sub-base materials have been achieved, or road base has been used, a thinner laying course can be used.

SURFACE COURSE**B. EDGE RESTRAINTS**

Edge Restraints shall be provided along the perimeter of all paved areas and shall be adequate to support traffic loads and to prevent the escape of laying course material from beneath the paved surface. Edge restraints shall be formed before compacting adjacent blocks and the restraint together with any concrete haunching shall be mature before vibration of the surface course is undertaken. Haunching to an edge restraint on the paving face shall be vertical down to the level of the underside of the laying course.

(A) LAYING BLOCK PAVING

The blocks shall be laid hand-tight in the design pattern working from an existing laying face edge or edge restraint wherever possible. Mechanical forces shall not be used to obtain tight joints. Block shapes designed to assist with formation of boundaries and with changes in direction may be incorporated as appropriate. Full blocks shall be laid first; closure units shall then be laid. The area to be laid shall be completed as far as it is possible in entire block units. Infilling to boundaries and obstructions shall proceed as the laying of the surface course proceeds and in any case, infilling shall be completed before compaction commences.

PLUMBING AND DRAINAGE SPECIFICATION**A. GENERAL**

This section specifies the general requirements for plant, equipment, and materials.

B. AUTHORITATIVE STANDARDS AND CODES OF PRACTICE

The authoritative standard referred to in this Specification are B.S or B.S codes of practice. Should the contractor wish to substitute any other authoritative standard or code of practice for any referred to in the specification, he must submit details of any such standard or code of practice with two copies of the document for approval by the Architect. Approval will only be given to use an alternative standard or code of practice if the Architect considers the proposed standard or code or practice will produce work of a standard equal or better than that of the specified standard or code of practice.

The whole of the plumbing works is to be executed by a registered plumber and drain layer in strict accordance with the Regulations of the Local Authorities and to the satisfaction of the Architect.

C. MATERIALS**GALVANIZED STEEL PIPEWORK**

Galvanized steel pipe work shall be manufactured to comply in all respects with the standards described for black steel pipe work.

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

D. COPPER TUBING

All copper tubing shall be manufactured in accordance with B.S.2871 from C.160 'Phosphorus De-oxidized Non-arsenical Copper' in accordance with B.S.1172.

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

PLUMBING AND DRAINAGE (CONT'D)

Short copper connections tubes between galvanized 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 connections in any other way than by the use of copper tubing, then a brass straight connector shall be positioned between the galvanized pipe and the copper tube in order to prevent direct contact.

A. CAST IRON PIPEWORK

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

All joints on cast iron spigot and socket pipes shall be made with an approved cold caulking compound and contraction which may take place.

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

B. EXTERNAL SERVICES

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

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

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

PLUMBING AND DRAINAGE (CONT'D)**A. CONCRETE PIPE**

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

The joints of concrete pipe and fittings may be one of the following depending upon 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 an approved cement mortar mix.

B P.V.C (HEAD) PRESSURE PIPE AND FITTINGS

All PVC pipes and fittings shall be manufactured in accordance with B.S 3505:1968.

C. JOINTING

The method of jointing to be employed shall be that of Solvent Welding, using the pipe and manufacturers approved cement. Seal ring joints shall be introduced where it is necessary to accommodate thermal expansion.

PLUMBING AND DRAINAGE (CONT'D)**A. 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.

B. PIPE BED

Pipe shall be uniformly laid on a 75mm thick bed, (the full width of trench) of fine grained material (sand or red soil) and must not be allowed to rest on the joint or on stones etc.

C. SUPPORTS TO FITTINGS

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

D. BACKFILLING

For the protection of the pipe initial backfilling shall be carried out as soon as possible after laying.

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

E. TESTING

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

PLUMBING AND DRAINAGE (CONT'D)**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 fittings shall be manufactured in accordance with the requirements of B.S.1010.

B. GATE VALVES

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

C. GLOBE VALVES

All globe valves up to and including 65mm nominal bore shall be of bronze construction with the requirements of B.S 3961.

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

D. CHECK OR NON-RETURN VALVES

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

The pressure classification of all check or non-return valve shall depend upon the pressure conditions pertaining to the Site of the works.

PLUMBING AND DRAINAGE (CONT'D)**A. BALL VALVES**

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

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

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

B MANUALLY OPERATED MIXING VALVES

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

WASTE FITMENT TRAPS**C. STANDARD AND DEEP SEAL P & S TRAPS**

Where standard or deep 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.

D. ANTI-SYPHON TRAPS

Where anti-syphon traps are specified, these shall be similar or equal to the range of traps manufactured by Terrain – their self-resealing traps or by Marley Extrusions Ltd. – their Anti-syphon Traps.

PLUMBING AND DRAINAGE (CONT'D)**PIPE SUPPORTS****A. GENERAL**

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

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

Consideration shall be given when designing supports, to the maintenance of desired pipe falls and the restraining or pipe movement 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 Engineer for approval before any erection work commences.

B. STEEL AND COPPER PIPES AND TUBES

Pipe runs shall be secured by pipe clips connected to pipe hangers, wall brackets, or trapeze type supports. 'U' bolts shall not be used as a substitute for pipe clips without the prior approval of the Engineer. An approximate guide to the maximum permissible supports spacings in metres for steel and copper pipe and tube is given in the following table for horizontal runs.

PLUMBING AND DRAINAGE (CONT'D)

SIZE MINIMAL BORES	COPPER TUBE TO B.S 659	STEEL TUBE TO B.S. 1237
15mm	1.25m	2.0m
20mm	2.0m	2.5m
25mm	2.0m	3.0m
40mm	2.5m	3.0m
50mm	2.5m	3.5m
65mm	3.0m	3.5m
80mm	3.0m	3.5m
100mm	3.0m	4.0m
125mm	3.0m	4.5m
150mm	3.5m	4.5m

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

A. 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 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 settlement and building movement do not break the pipe joints.

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

The Sub-Contractor when arranging his piping shall ensure that no expansion movements being transmitted from pumps to piping systems or vice versa.

PLUMBING AND DRAINAGE (CONT'D)**A. JOINTING PIPES**

Joints shall be made strictly in accordance with the manufacturer's instructions. The Sub-Contractor shall make use of the technical advisory services offered by manufacturers for instructing pipe jointers in the methods of assembling joints.

Where manufacturers recommend the use of special jointing tackles, the Sub- Contractor shall use these for the assembly of all joints to pipes. Sockets shall be laid looking uphill unless otherwise approved.

Before making any joints, all jointing surfaces shall be thoroughly cleaned and dried and maintained in such condition until the joints have been completely made or assembled. Notwithstanding any flexibility provided in the pipe joints, pipes must be securely positioned to prevent avoidable movement during and after the making of the joint.

The space between the end of the spigot and the shoulders of the socket of flexibility jointed piped when jointed shall be as recommended by the manufacturer or order by the Engineer.

After flexibly jointed pipes, other than PVC pipes have been jointed the gaps between the barrel of the pipes and internal face of the socket shall be sealed with puddle clay, rope yarn or other approved material. The rope yarn or other material must have been treated so as not to support bacterial growth.

Where loose collars are used to join the pipes cut for closers, special tools shall be employed to keep the inside of the pipes flush and the collar concentric with the pipe while the joint is being made.

Pipes provided with spigot and socket joints of the self-centering, instantaneous joint type, such as the rubber ring push fit joint, shall be laid and jointed strictly in accordance with the maker's instructions. Generally, the joint ring shall be cleaned and inspected for cuts and defects, and socket and spigot examined to ensure freedom from oil, grease, tar and grit. The makers recommended lubricant will be used.

PLUMBING AND DRAINAGE (CONT'D)**B. SOLVENT WELDED JOINTS**

Only the solvent cement recommended by the manufacturer for his pipe joint system shall be used and his instruction on the making of the joint shall be closely followed.

Excess solvent cement shall not be applied to the insider of the pipe socket and all surplus solvent shall be removed from the joint and the pipe.

Any solvent falling on the trench formation shall be removed by excavating the contaminated soil.

Solvent welded pipes jointed outside the trench shall not be lowered into the place until the elapse of time recommended by the manufacturer. The time allowed for curing shall be increased with lower temperatures.

A. CONNECTION OF TUBING TO STORAGE TANKS, HOT WATER CYLINDERS AND SANITARY FITTINGS

Each connection of tubing to cold water storage tanks shall be made by drilling a hole in the tank side and using a long screw, union and two back nuts all well screwed up in red lead. Joints of tubing to flanged and bossed connections of hot water cylinders shall be made with a boiler screw, union and back nut screwed up in red lead.

Connections to sanitary fittings shall be made with 450mm lengths of copper tubing bent to shape as required with copper to iron couplings at each end, and red lead joint to joint union of fittings and tubing.

All sanitary-ware fittings shall be left in a clean and good condition to the satisfaction of the Engineer.

All fittings shall be fixed in accordance with the manufacturer's instructions and shall comply with the general requirements of B.S Code of Practice 305 and the Particular requirements of the latest applicable B.S Specification.

Lavatory basin brackets shall be cut and pinned to walls in cement mortar including making good rendering, tiling or plastering etc.

PLUMBING AND DRAINAGE (CONT'D)**B. PIPE SLEEVES**

Main runs of pipe work are to be fitted with sleeves where they pass through walls and floors. Generally, the sleeves shall be of P.V.C except where they passthrough 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 aroundthe insulation. The sleeve will then be packed with slag wood or similar.

C. CUTTING PIPES

Iron pipes shall be cut by a method and with apparatus which provides a cleansquare cut of the pipe and of the lining, if any, without damage to pipe or lining.

All cut or trimmed ends, and the parts of any pipe on which the coating may have suffered damage shall be recoated with bitumen before the pipes are laid. The externalarea at cut spigot ends of ductile iron pipes shall be ground for a distance of at least 125mm.

Asbestos-cement pipes shall be cut by hacksaw or other approved means to a square and even finish without splitting or fracturing the wall of the pipe. A percentage of the pipes ordered shall be supplied with fully turned barrels and these pipes will be setaside for use in cutting specific lengths. When no fully turned pipes are available a hand operated turning machine shall be used to prepare the ends of cut pipes for Johnson Couplings, barrel joints or collar joints.

Pitch-impregnated fibre pipes shall be cut by saw and where necessary the end shall befilled or machined to the required 2 degrees taper.

Concrete pipes shall be cut to a square and even finish without splitting or fracturing the wall of the pipe. Reinforcement shall be cut back flush with the concrete and bare metal protected with bituminous paint or cement grout as directed.

Only steel pipes supplied rounded throughout their length shall be used as cut pipes to form closures. The cutting shall be done by an approved method and apparatus which provides a clean square cut, without separation of the lining from the pipe wall. Minor damage to the lining may, if permitted be repaired on site in accordance with the manufacturer's instructions. Where in the opinion of the Engineer the damage is serious the pipe or special shall be returned to the manufacturer for reconditioning.

PLUMBING AND DRAINAGE (CONT'D)**A. PIPES BUILT INTO STRUCTURES**

The outside surface of all pipes and special castings to be built into structures shall be thoroughly cleaned immediately before installation. Where ordered protective coating to metal pipes shall be removed from the sections to be built in, while the external surfaces of fireclay and concrete pipes shall be roughened to form a key or concrete or mortar.

Sheathing to steel pipes shall be cut away from the sections to be built-in and after erection the protection shall be completed by applying approved bituminous material around the barrels of pipes at the junctions with structures.

Pipes passing through water retaining walls and floors shall, where possible, be built into the structure in-situ. Shuttering shall be formed closely to the outside of the pipes, and concrete shall be placed and compacted thoroughly round pipe and puddle flange, if any.

Where fixing in the course of construction if not possible, temporary opening in structures, formed to the dimensions shown by the Engineer shall be left where indicated or directed to accommodate the subsequent erection of pipes and special castings. In water retaining structures, they shall taper to a smaller dimension towards the external faces of structures and shall include where indicated a water stop. In basements, dry chambers at pumping stations etc., temporary openings shall taper to a smaller dimension towards the internal faces of structures and shall also include, where indicated a water stop. Prior to in-filling, all surfaces against which fresh concrete is to be placed shall be prepared as specified, while the external surfaces of pipe work shall be prepared as described in this clause.

B. SETTING VALVES

Care must be taken to prevent damage to all valves, fire hydrants and the like, and their ancillary equipment. Valves etc. and ancillary apparatus shall be stored in clean conditions and in a manner that excludes all water. Where directed, head-stock, motors, gearing or indicators shall be removed, adequately labelled for identification, stored carefully in weather-proof premises and be reconnected after erection of the valves. Frost cocks shall be kept clean and free from obstruction. Electrical equipment shall be protected from damp and the damp-proofing seals shall remain intact until the electrician is ready to connect up the equipment.

PLUMBING AND DRAINAGE (CONT'D)

The gun metal faces, and seats of all valves must be kept clean. No valve shall be closed without first wiping the faces with a clean cloth. The cavity beneath the valve door shall be thoroughly cleaned by hand. In the event of accident, fouling matter shall be either dissolved or carefully removed by methods that do not involve scraping or gunmetal faces.

All valves shall be set so that operating spindles are truly vertical unless otherwise detailed or directed.

Every stuffing box shall be examined when the main is charged with water and leaking boxes shall be adjusted or replaced with square plaited lubricated hemp packing or approved manufacture. The stuffing box shall not be so tightly packed as to materially affect the friction of the packing on the spindle.

No air valve shall be stored before erection in the open in sunlight, or upside down to expose the balls and air cavities. Air valves shall be checked before the main is charged to ensure that the balls and faces are not scored or split and that there are no direct or other deleterious materials in the cavities of the body. All air nozzles shall be probed to see that they are clean.

Fire hydrants, frost plugs and similar fittings shall be checked before being incorporated in the line and before the main is charged to ensure that all passageways are clean.

The installation of special types of valve and metering equipment must be strictly in accordance with the manufacturer's instructions.

The direction of opening of the valve shall be indicated on the headstock and on the underside of hydrant covers.

INSTALLATION**A. 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.

PLUMBING AND DRAINAGE (CONT'D) ABOVE**GROUND INSTALLATION****A. WATER SERVICES**

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

Where falls are not shown on the Contract Drawings or stated elsewhere in the specification, pipe work shall be installed parallel to the lines 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 user equipment shall be installed with adequate access for operation and maintenance where valves and other operational equipment are unavoidably installed beyond normal reach or in such position as to be difficult to reach from a short step ladder, extension spindles with floor or wall pedestals shall be provided.

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

Full screwed joints to piping and fittings shall be made with P.T.F.E Tape in accordance with B.S 4375.

The test pressure shall be maintained by the pump for about one hour and if there is any leakage, it shall be measured by the 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 metres head, may be considered reasonable but any visible individual leak shall be repaired.

A. SANITARY SERVICES

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

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

The Sub-Contractor shall provide all necessary roding and inspecting facilities within the draining system in position where easy accessibility is available.

Where a branch requires roding facilities in a position to which normal access is unobtainable, then that branch shall be extended so as to provide a suitable purpose made roding 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 plastic coated or galvanized steel, wire guard.

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

B. 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 C.P 305 to the approval of the Engineer.

UNDERGROUND INSTALLATION

A. GENERAL

All underground water and drainage service installation shall be installed in accordance with the best standard of modern practice as described C.P. 301 and C.P. 305 respectively and the following clause.

BEDDING

B. GRANULAR BEDDING MATERIAL – TYPE A

Granular bedding Type A shall comprise broken stone or gravel, crushed brick or concrete to pass a 25mm sieve and be retained on 5mm sieve thoroughly mixed with free draining coarse sand in the ratio of one part sand to two parts stone or gravel; or aggregate to B.S. 882 Table 3 or other material which in the opinion of the Engineer has similar characteristics.

Particles shall be rounded or angular but not flaky or elongated and of adequate crushing strength to produce when tested in accordance with B.S. 812 a 10 percent fines value, greater than 5 tonnes.

C. SELECTED FILL – TYPE B

Type B selected fill shall be uniform readily compatible material from tree roots, vegetable matter and building rubbish. All clays lumps retained on a 75mm sieve and all stones retained on a 25mm sieve shall be excluded.

D. GRANULAR BEDDING MATERIAL – TYPE C

Granular bedding Type C shall be as Type A bedding material but with all material passing a 10mm sieve. In addition, where used to be flexible not exceeding 0.1. The **compaction factor test** shall be carried out as follows:

E. EQUIPMENT

1. An open-ended cylinder 225mm long and 150mm internal diameter, (a pitch) fibre of PVC pipe is suitable).

PLUMBING AND DRAINAGE (CONT'D)

2. A metal rammer with a skirting face 40mm diameter weighing 0.9 to 1.1 Kg.
3. A measuring rule.

A. METHOD

A representative sample more than sufficient to fill the cylinder is obtained, (about 12 kg). It is important that the moisture content of the sample should not differ significantly from that of the material from which the sample was obtained at the time of the use of the trench.

The cylinder is placed on a firm surface and the material sample poured into it loosely and without tamping. The top surface of the material is struck off level with the top of the cylinder and all surplus material removed. The cylinder is then lifted clear of its contents and placed on a clean area of the flat surface. About one quarter of the material is then placed back in the cylinder and tamped thoroughly until no further compaction can be obtained. This procedure is repeated until with the second, third and final quarter tamping each successive surface as level as possible.

The height from the material surface to the top of the cylinder is then measured with the rule and this distance divided by the height of the cylinder, (225mm), is referred to as the Compaction Factor. For each batch of material three (3) Compaction Factor Tests will be made and if the average value is greater than

0.1 then the batch of material will be deemed to be unsuitable for use as Type C bedding material. Material sufficient for the bed and surround of 200 linear metres of pipe will be considered to comprise a batch.

B. BEDDING AND SURROUND FOR CONCRETE PIPES

The material to be used for bedding and surround for concrete pipes shall not contain more than 0.3 per cent sulphate expressed as sulphur trioxide nor shall it be obtained from a site where the ground water contains more than 0.1 per sulphate.

A. FIELD OR FRENCH DRAINS

Pipes for French drains shall be either British Standard Surface pipes glazed or unglazed manufactured to B.S 65 and 540, with Type 2 sockets or plain ended supplied with sleeve couplings or Type 1 perforated socketed and sleeve coupled pipes porous concrete pipes to B.S 1194.

B. DEFINITIONS

For the purpose of underground piped services the following definitions shall apply:

- (a) Top soil shall mean the top layer of soil that can support vegetation.
- (b) Suitable material shall mean all material capable of being compacted, forming a stable fill and approved as such by the Engineer.
- (c) Unsuitable material shall mean material other than suitable material and shall include material from swamps, marshes or bogs, peat, logs, stumps, or other perishable material, clay of liquid limit exceeding 80 and/or plasticity index exceeding 55, or materials having greater moisture content than approved for use.
- (d) Rock in excavation shall mean such material which cannot be excavated by hand methods and individual solid boulders exceeding 0.2 cu.m.
- (e) 'Rigid pipes' shall mean pipes of cast or spun iron, concrete asbestos cement, clay or similar materials.
- (f) 'Flexible pipes' shall mean pipes of steel, PVC or other plastic, pitch fibre, ductile iron or similar materials.
- (g) 'Rigid joints' shall mean joints made of bolting together flanges integral with the barrels of the pipes, by welding together the barrels of the pipes, by caulking sockets with non-deformable material, such as cement mortar, run lead or by similar techniques.
- (h) 'Flexible joints' shall mean joints made with factory-made jointing materials, loose collars, rubber rings etc., and which allow some degree of flexing, however small, between adjacent pipes.

A. TYPES OF PIPE

The Contractor shall construct the pipeline using the designs of pipe, bed, haunch and surround detailed on the Drawings.

Where the Contractor wishes to use a type of pipe not manufactured in the minimum internal diameter indicated in the Contract, he may substitute the next larger diameter manufactured, subject to compliance with the design requirements, clearance and cover. The Contractor shall not use pipes and fittings supplied by more than one manufacturer without approval.

B. SETTING OUT

The Contractor shall set out the underground services to the lines shown on the Drawings. Where the service is required laid to falls these shall be set by means of proper sight rails and boning rods.

Sight rails shall be of the following minimum standard. They shall be adjustable sight rails of 150mm x 30mm wrought softwood of length 1m painted black and white as directed secured to strong uprights embedded in the ground at distances not exceeding 60 metres.

Care shall be taken to ensure that these sight rails are not obscured by spoil from the excavation.

C. EXCAVATION

The Contractor shall carry out the excavation in accordance with the Drawings and shall comply with the slopes, levels, depths and heights shown thereon.

Unless otherwise directed topsoil shall be striped, laid aside and kept separate from other excavated materials for reuse. Road bottoming and surfacing material which is approved as suitable for re-use shall be laid aside and kept separate from other excavated materials.

Where shown in the Contract or directed topsoil shall be striped over the full width of the working area before any other operation is carried out and soil deposited in dumps. On completion of the other operations the soil shall be evenly spread over the stripped surface.

PLUMBING AND DRAINAGE (CONT'D)

Excavation shall be carried out the dry and both trenches and general areas shall be kept free from water by pumping, provision of temporary drains, sumps and

Excavations shall be taken out to the least dimensions required to accommodate the service and the working space necessary for its installation subject to the following restrictions. All excavations shall be carried so that the soil beneath receives the maximum amount of disturbance.

Unless otherwise directed the overall width of pipe trench excavation from the trench bottom to a level 300mm above crown of the pipe shall be in accordance with the following table:

Table 40.1 – Pipe Trench Widths

Nominal Internal Diameter (mm)	Minimum overall Trench width (mm)	Maximum overall Trench width (mm)
100	430	630
150	500	700
200	550	750
225	580	780
300	680	880
375	950	1150
400	1000	1200
450	1330	1230
525	1120	1320
600	1240	1440
675	1330	1530
750	1400	1600
825	1490	1690
900	1920	2120
1050	2100	2300
1200	2290	2490
Above 1200	Outside diameter of Pipe plus 800mm	Outside diameter of Pipe plus 1000mm

Battering or stepping of the sides of trenches, if approved, will only be permitted from 300mm above the crown of the pipe to the original ground level.

PLUMBING AND DRAINAGE (CONT'D)

The maximum trench width given above shall be measured to the earth face of any sheeting or trench supports.

Excavation shall be taken to the depth required for the class of bedding shown on the drawings. Any excavation greater than this depth shall be filled with the same material as required for bedding to the Engineer's satisfaction and at the Contractor's expense.

When concrete is directed to be cast directly against existing soil the excavation shall be neatly executed to the shape required.

Excavation shall be timbered, sheet piled or otherwise supported to ensure the stability of the surrounding ground, the Works and adjacent structures and to ensure the safety of all persons.

The sides of excavation will be battered only where approved or directed.

All over-excavation due to slips, over break and the like shall be remedied at the Contractor's expenses, by infilling with suitable material as directed by the Engineer.

Should the Engineer regard the Contractor's support of any excavations as inadequate then the Contractor shall comply with any instruction by the Engineer to alter or increase the support. Any instruction so given by the Engineer will in no way relieve the Contractor of his responsibilities under the Contract.

Material from excavations other than unsuitable material shall be set aside clear of the sides of excavation for reuse. Unsuitable material shall be removed to the Contractor's tip.

When the final level of the foundation, as shown on the Drawing or directed by the Engineer, has been reached the Engineer will inspect and approve the foundation prior to the commencement of concreting or other work thereon. The bottoms of all excavations shall be carefully shaped for slope as shown or directed. Any pockets of soft or loose material shall be removed and any cavities or fixtures filled as directed.

The Contractor shall at his own expense make good with mass concrete or as directed excavation greater than required for the complete work. Material which the Contractor has allowed to become unsuitable shall be removed and replaced with mass concrete or as directed, at the Contractor's expense.

PLUMBING AND DRAINAGE (CONT'D)

The Contractor shall provide whatever additional pipe protection is directed specified maximum width be exceeded due to his method of working.

Where rock or boulders are present in pipe trenches specified to have Class C or FD bedding the sides of the trenches shall be so trimmed that when the pipe is laid to the correct level and alignment no projection of the rock comes within 100mm of the outside of the pipe barrel at any point.

Where rock is found in the bottom of trenches for pipes specified to have Class C or FD bedding, the trenches shall be excavated to the additional depth necessary to allow for Class B or FC bedding respectively.

The Contractor shall avoid unduly disturbing the finished trench formation and shall make good, disturbed areas and excavate any wet or puddled material which might result from his failure to do so.

Where directed trenches close to existing structures shall be opened in short lengths and refilled or partly filled with mass concrete or other approved material.

Trenches for pipes carrying water under pressure, except where otherwise required by the Contract, shall be excavated to a sufficient depth to ensure, after consolidation of the refilling, a normal minimum depth of cover of 800mm from the ground surface to the top of the pipe. Under roads a normal minimum depth of cover of 900mm shall be provided. Where the pipeline is required to be laid to a depth which does not permit this condition to be fulfilled the ground surface shall be made up locally with banking as directed.

A. Pipe laying General

On arrival at the Site, pipes shall be carefully inspected for damaged ends, cracks or other defects and any found to be faulty shall be marked and set aside for a decision from the Engineer as to their acceptability.

Pipes with damaged ends may be either completely replaced or have the endscut off and trimmed as directed by the Engineer.

PLUMBING AND DRAINAGE (CONT'D)

The Contractor shall ensure that all pipes are properly handled both by his staff and by any cartage Contractor employed by him. During transport, pipes shall not be allowed to rest on narrow cross-members of vehicles or anything else that might give concentrated loads due to the weight of the pipe or bumping of the vehicle but shall be properly supported on soft material. Sufficient labour and equipment shall be on hand before loading and unloading is commenced and under no circumstances shall any pipes be dropped or thrown from a vehicle.

The Engineer will have the right to reject consignments or stock of piping from which failed pipes have been drawn, or order them to be pressure tested to works pressures outside the pipelines at the Contractor's expense even though no defects are apparent, if there is reason to believe that mishandling has taken place.

Flat braided wire slings shall be used for slinging all pipes except externally coated pipes and plastic pipes for which only special band slings not less than 300mm wide shall be used. Chain or rope slings, hooks, or other devices working on scissor or grab principles shall not be used. Subject to the requirements of inspection before acceptance, protective bolster, caps or discs on the ends of flanges of pipes, specials or fittings shall not be removed until the pipes, specials, or fittings are about to be lowered into the trench.

Before a pipe is lowered into the trench, it shall be thoroughly examined to ensure that the internal coating or lining and the outer coating or sheathing are undamaged.

A. Laying of Pipes

Every pipeline shall be accurately laid to correct line and level perfectly true from joint to joint.

Whenever work is suspended, the open ends of all pipes and junctions shall be adequately plugged to prevent the ingress of any soil or rubbish etc. Care shall be taken at all joints to prevent ingress of any material.

Immediately after laying, the open end of a pipe shall be sealed with a wooden plug or approved stopper of appropriate size to prevent the entry of material which might contaminate the pipeline, damage the linings, obstruct the waterway or affect the working of valves, meter etc. Plugs shall be unperforated and shall be shaped to fit exactly so that water from the trench excavations cannot gain access to the pipeline.

PLUMBING AND DRAINAGE (CONT'D)

Water pipes and fittings 150mm and under in diameter shall have a brush equal in diameter to the internal bore of the pipe drawn through them as the work proceeds. The brush shall not be removed from the pipeline from commencement until completion.

The plugs in sewers may, with the Engineer's approval, be provided with small holes for drainage purposes, but water from the trench excavation which is heavily charged with silt shall not be allowed to gain access to the pipe.

Where work is interrupted for a period, the plugs left in position shall be regularly inspected for their fixing to ensure that there has been no tampering by unauthorised persons. Whenever any plug is removed, the immediate length of pipe shall be examined for dirt or obstructions and shall be cleaned as required.

Adequate precautions shall be taken by way of backfilling or other means to anchor each pipe securely to prevent floatation of the pipeline in the event of trench being flooded.

No equipment, clothing or apparel shall be left or stored inside pipeline.

If the normal continuity of construction would otherwise be interrupted pending the delivery of valves or specials, the exact extent of the temporary gaps to be left shall be pre-determined after reference to the Engineer. The Contractor shall submit dimensioned sketches, to the Engineer for approval, showing details of the pipes and jointing arrangements to be adopted to effect ultimate closures.

Care shall be taken to preserve the accurate alignment of the pipeline across all such temporary gaps.

MANHOLES**A. GENERAL**

All manholes provided under the Sub-Contract Works shall be constructed of approved materials and in an approved manner.

All manholes shall be water-tight and if constructed of brickwork, solid block work or stonework, they shall be rendered internally with a cement mortar of at least 12mm thickness and finished with a smooth surface.

PLUMBING AND DRAINAGE (CONT'D)

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° to the horizontal and floated to a smooth hard surface with a coat of 1:1 cement mortar.

In all other respects, manholes shall be constructed in accordance with B.S Code of Practice 301.

B. RECTANGULAR AND SQUARE MANHOLES

Rectangular and square straight through manholes shall be constructed from solid block work, stonework or concrete to comply with the following minimum internal dimensions (millimetres).

PLUMBING AND DRAINAGE (CONT'D)

Depth below ground of outgoing invert	Internal access shaft dimensions L X W	Size of main channel diameter	Internal chamber dimensions L X W	Height of chamber above benching	Wall thickness
Up to 740	-	100 to 150	610 x 450	-	150
Up to 740	-	200 to 460	760 x 760	-	150
Up to 1200	-	100 to 150	760 x 760	-	150
160 to 1200	-	230 to 460	910 x 910	-	150
1220 to 1800	-	100 to 150	910 x 910	-	150
1220 to 1800	-	230 to 460	1070 x 910	-	150
1830 to 4550	760 x 760	100 to 150	1370 x 910	1370	230

When branches are connected into the manhole, the length and width dimensions of the chamber shall be increased as follows:

PLUMBING AND DRAINAGE (CONT'D)**Length****Branch Diameter**

100mm 300mm/branch on the side with most branches 150mm

380mm/branch on the side with most branches

230mm 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 plus 160mm 460mm of the diameter of the main drain which ever is the greater.

A. 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).

Ground depth 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	1200	1370
4570 and 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 1830 mm.

PLUMBING AND DRAINAGE (CONT'D)

B. STEP IRONS AND COVERS

Access shaft to manholes of depths greater than 760mm shall be provided with approved step irons at suitable intervals.

Every manhole or manhole access shaft shall be fitted with a removable air-tight cast iron cover to adequate size and strength, fixed in a manner which 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	:	1 For Carriage ways
Medium Duty	:	For Footpaths
Light Duty	:	For domestic premises or other

places where they do not have to carry wheeled traffic.

A. 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 backdrop connection.

Back drop connections shall be made in accordance with the details shown on the relevant Sub-Contract Drawings and the requirements of B.C Code of Practice 301.

B. 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.

PLUMBING AND DRAINAGE (CONT'D)**A. TESTING OF PIPELINES**

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

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

B. CONCRETE BEDDING, HAUNCHING AND SURROUND

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

C. 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.

D. REINSTATEMENT OF SURFACES

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

Where excavations have been carried out in public highways or other areas 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 or Highway Authority, whether this is carried out by the Sub-Contractor or by the Authority concerned.

No claims for extras in this respect will be accepted.

PLUMBING AND DRAINAGE (CONT'D)**A. SEWER CONNECTIONS**

The Sub-Contractor shall pay all charges associated with the connection by Local Authority of the drainage for the Main Sewer, including necessary reinstatement.

TESTING AND INSPECTION**SITE TESTS – PIPEWORK SYSTEMS****B. UNDERGROUND WATER MAINS**

After laying, jointing 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 sections as the work of laying proceeds and all joints shall be exposed for inspection during the testing.

The open end of the main may be temporarily closed for testing under moderate pressure by fitting a water pipe expanding plug, of which several types are available. The end of the main and the plug should be secured by struts or otherwise, to resist the end thrust of the water pressure in the main. If the section of main terminates with a sluice valve, the wedge of the valve shall not be used to retain the water, instead the valve shall be fitted temporarily with a blank flange, or 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 supports to withstand the end thrust of the water pressure in the main.

C. ABOVE GROUND INTERNAL WATER SERVICE 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 a half times the design working pressure.

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

PLUMBING AND DRAINAGE (CONT'D)

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 items damaged shall be repaired or replaced at the Sub-Contractor's expenses.

A. UNDER GROUND DRAINAGE SYSTEM

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

Short branch drains connected to a main drain between manholes shall be tested as one system with 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, drain pipe 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 Practice 301. Clause 601 f).

PLUMBING AND DRAINAGE (CONT'D)**A. ABOVE GROUND SOIL WASTE AND VENTILATION PIPE SYSTEM**

All soil, waste and ventilating pipe system forming part of the above ground installation, shall be given a smoke test to a pressure of 38mm of water gauge and this pressure shall remain constant for a period of not less than three minutes.

Water tests on above ground soil, waste and ventilating pipe systems shall not be permitted.

Pressure tests shall be carried out before any work which is to be concealed is finally enclosed.

Any defects revealed by the tests shall be made good by the Sub-Contractor and the test repeated to the approval of the Engineer.

In all other aspects, tests shall comply with the requirement of B.S 5572

SITE TEST - PERFORMANCE**B. GENERALLY**

Following satisfactory pressure tests on the pipe work systems, 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, controls, fittings, equipment and plant are functioning correctly to the satisfaction of the Engineer.

All hot water pipe work shall be insulated with preformed fibre glass sectional lagging to a thickness of 25mm.

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

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

- (i) Apply a coating of a suitable filler until the canvas weave disappears and allow to dry.

PLUMBING AND DRAINAGE (CONT'D)

- (ii) Apply two undercoats of an approved paint and finish in suitable gloss enamel to colours approved by the Engineer.

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

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

The test pressure shall be applied by means of a manually operated test pump or, in the case of long main or mains or larger 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 pressures should not exceed 120, 180 and 240metres/head of Clause B, C, or D pipes.

A. STERILIZATION OF HOT AND COLD WATER SYSTEMS

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

The sterilization procedures shall be carried out by the Sub-Contractor or specialist employed by the Sub-Contractor in accordance with the requirements of B.S Code of Practice 310. Clause 409, to the approval of the Engineer.

ELECTRICAL MATERIALS AND WORKS

A. REGULATIONS

This specification covers the requirements of lighting and power installations in Kenya.

All apparatus and materials supplied for and all work carried out shall comply with Kenya Government Electrical Specifications, GES 1 and 2 local statutory Regulations and the Supply Authority Bye Laws.

Installations should also be in accordance with the requirements of the 16th Edition of the "Regulations of the Electrical Equipment of Buildings" issued by the Institute of Electrical Engineers of Great Britain, which should be used as a "Code of Practice", except where they conflict with Kenya Government Legislation regarding electrical installations and local amendments.

B. STANDARDS

Except where otherwise indicated in this specification, the Contract works and all manufactures items shall comply with the relevant specifications of the British Standards Institution. Such specifications are hereinafter referred to as B.S. In each case, the latest editions of such specifications shall apply.

Should it be desired to offer equipment covered by other National or international standards, the approval of the Engineer must be obtained in writing before completion of the tender documents.

C. RECORD DRAWINGS

The sub-contractor shall mark accurately on one set of drawings the conduit laid during the progress of the work. This information must be made available on site for inspection by Engineer.

At the completion of the Contract. The contractor shall supply the Engineer with one set of transparent originals and two complete sets of prints showing the complete installation. The drawings shall include the location of all apparatus conduits and cable routes, and a schematic diagram of mains distribution indicating the phasing of the system.

ELECTRICAL MATERIALS AND WORKS (CONT'D)**A. CONTRACT DRAWINGS**

These drawings forming part of this specification are to be read in conjunction with this specification to enable the Contractor to prepare a tender.

These drawings are not intended to be used as working drawings unless they are released for that purpose.

Circular or square boxes shall be provided at all outlet points, unless otherwise specified and lighting fittings, ceiling switched and other accessories will be screwed to the internal lugs of the boxes. Care must always be taken when considering the use of totally enclosed fitting with polyvinyl chloride circular boxes where the temperature within the box is likely to rise above 60 C (140 F) special steel insert clip should be used in conjunction with circular boxes where this problem can arise and also in situations where heavy pendants are used.

Looping in boxes of circular polyvinyl chloride pattern to sheet 63 B.S. 4607 part 2 may be used in such work as dictated by the structure of the buildings. Conduit entry shall be made by means polyvinyl chloride socket adaptors and polyvinyl chloride bushes.

Adaptable boxes shall be of moulded or fabricated polyvinyl chloride of square or oblong long shape complete with polyvinyl chloride lids secured by 2 BA brass or steel plated round headed screws. All adaptable boxes and lids for the same size shall be interchangeable. No adaptable box smaller than 75mm x 50mm or larger than 300mm x 300mm shall be employed. Boxes shall be of adequate depth in relations to the size of the conduit entering them.

Conduits shall be terminated at adaptable boxes, fuse boards, switches, sockets or other equipment not possessing push-in or threaded spouts; by means of appropriate size female adaptor and polyvinyl chloride Hexagonal headed Bare Bush. All cemented joints to be made to a depth of not less than the diameter of the conduit being used.

Earth continuity shall be provided by a separate insulated conductor drawn into the plastic conduit and related in accordance with circuit loadings and appropriate regulations, or as mentioned on the drawings.

Where required under the regulations, an earth continuity conductor shall be provided for lighting fittings in which case the control switches shall be equipped with an appropriate earth terminal.

ELECTRICAL INSTALLTION**TRADE PREAMBLES**

A. ARRANGEMENT OF CONDUIT LAYOUT

The conduit system shall be carefully planned and erected to avoid all unnecessary bends or changes in directions. Conduits shall be laid in straight horizontal or vertical lines with easy sets. Where several conduits follow similar routes, they shall be neatly grouped in multiple runs. Where multiple runs change direction, the radii of the sets shall be laid out from a common centre. Where draw-in boxes for right angled change of direction are required in multiple runs, adaptable boxes shall be used for such sizes as to allow all conduits to enter the box without sets.

The cables shall be coloured in accordance with Table B4 of Institute of Electrical Engineer Regulations. Cables used on extra low voltage circuits shall have distinctive colours other than these colours.

No reduction of the strands forming the conductors shall be allowed at switch or other terminals, but all strands shall be effectively secured by screws, nuts and washers or other approved means.

CEILING**B. TYPE**

Ceiling roses, ivory or white, shall be of the 3-plate pattern and fitted at all pendant points. An earthing terminal shall be provided and connected to the earth continuity conductor of the final sub-circuit where applicable.

Ceiling roses of the white porcelain semi-recessed pattern shall be used for surface installation and shall be of the all-insulated type for a flush installation.

LAMP HOLDERS**C. TYPE**

Lamp holders shall generally be of plastic construction with porcelain interiors, and bayonet fitting.

Lamp holders for lamps rated 200 watts and above shall be of Edison Screw type.

Batten type lamp holders shall be of the all-insulated bayonet type.

LIGHTING FITTINGS**A. GENERAL**

The Contractor shall supply and fit all lighting fittings of the type indicated on the drawings and in the schedules. All fittings shall be suitable for operation on a 240 V. 50 cycles supply. Lighting fittings rated other than 240 volts will not be supplied with lamps.

B. FLUORESCENT FITTINGS

Fluorescent fittings shall generally be of the batten type, with control gear contained within the supporting channel. All fittings shall be supported from conduits boxes and shall be suspended by two 20mm conduits to give a clearance of 25mm between the top of the fitting and the ceiling. In the ceiling, the conduit boxes, to B.S. 31, shall be fitted with dome covers, to which the suspension conduit shall be joined, so that the lighting fitting hangs vertically below the conduit boxes. Fittings shall comply with B.S. 3820 or class 1, indoor normal atmosphere.

All fluorescent fittings shall be fitted with radio interference suppression capacitors and power factor correction capacitors and shall be earthed.

C. LAMPS

All fittings shall be supplied complete with lamps of the type and rating specified. Fluorescent tubes shall be of the "White" type, except where otherwise stated. Pearly type tungsten lamps shall be fitted in open fittings.

FLEXIBLE CORDS**D. TYPE**

These shall be of 250 volt grade polyvinyl chloride insulated and shall comply with B.S. 7 Flexible cords shall not be less than 24/.20 (23/.0076). Flexible cords for pendant fittings shall be circular type, heat resistant and white in colour.

ELECTRICAL MATERIALS AND WORKS (CONT'D)**A. EARTHING**

Earth electrodes shall be minimum 2 metres long by 15mm diameter hard drawn copper rod, and shall be located not less than 3 metres apart at a convenient position 6 metres away from the building. The terminal head of each electrode shall be in a concrete inspection pit, with cover. If the resistance to earth is not satisfactory with the electrode, then additional electrodes or an earth mat shall be provided, as directed by the Engineer.

B. DISTRIBUTION SYSTEM EARTHING

All distribution boards shall be earthed in accordance with the institute of Electrical Engineer regulations. All metal work associated with the installation shall be earthed to comply with the regulations currently in force.

C. TESTING OF EARTHING SYSTEM

The resistance of continuity system, when measured between the main earthing point and any other point in the installation, including all conduit and other metalwork which may provide a path to earth, shall not exceed 0.5 ohm where steel conduit forms part or the whole of the systems, or 1.0 ohm, if the earth continuity system is composed entirely of copper, copper alloy or aluminium.

When the installation is complete, the sub-contractor shall carry out tests for earth loop impedance, polarity, insulation resistance, in the presence of, and to the satisfaction of the Engineer and the Kenya Power & Lighting Company. The Contractor shall rectify all work not giving test results within the limits prescribed.

Four copies of all test results shall be forwarded to the Engineer and a Certificate of completion will not be issued until such tests have been approved.

ELECTRICAL MATERIALS AND WORKS (CONT'D)**A. WORKING DRAWINGS**

The Contractor shall prepare working drawings as may be necessary. These shall be submitted to the Engineer for approval before the execution of the works.

Working drawings to be prepared by the Contractor shall be detailed as below but not restricted only to these: -

- (a) General arrangement drawings showing plants, M.V. Switchboards, distribution boards, consumer units, fittings, switch sockets, etc.,
- (b) Layout drawings of concealed and surface conduits, ducts, trunking etc.
- (c) Any other drawings that are not called for in the specification.

Two copies of all working drawings shall be submitted to the Engineer for approval.

Thereafter, the Contractor shall submit copies of approved working drawings for distribution to all parties concerned.

The Contractor shall not be relieved of any of his obligations under the contract or from correcting any errors on site or elsewhere found consequently in the approved working drawings by the Engineer.

B. LABELS

All switchgear, switch fuses, distribution boards etc., shall be clearly labelled with white on Red background engraved labels to indicate the name, purpose and position of the gear. All circuits in distribution boards shall be clearly identified in respect of the number and location of the M.C.B. The chart shall be securely fixed inside the cover of the distribution boards.

ELECTRICAL MATERIALS AND WORKS (CONT'D)**A. GALVANIZING**

Galvanizing shall be applied by the hot process and shall consist of a smooth clean zinc coating free from defects and be uniform in thickness. The thickness shall not be less than 610gms. of zinc per square metre of surface and tested in accordance with the requirements of B.S. 729 where applicable. Sheradizing or other alternative processes shall not be used without approval in writing of the Engineer.

The preparation of galvanizing and the galvanizing itself shall not adversely affect the mechanical properties of the coated material. Surfaces which are normally in contact with oil shall not be galvanized or cadmium plated.

All out-door structures, access ladders, platforms, equipment cubicles shall be galvanized.

B. NON-METALIC CONDUIT**STANDARD AND INSTALLATION**

All non-metallic conduits shall be class "A" heavy gauge, high impact, P.V.C. complying with B.S. 4606 part 2, type AH. The minimum size to be used on the Contract is 20mm external diameter. All conduit installation shall be concealed in the walls and floors or in structural slab.

C. JOINTS

Conduit will be joined and terminated utilizing the appropriate rigid P.V.C. compounds as detailed below or standard conduit entry electrical equipment. Jointing will conform to one of the following techniques:-

No. 1 - Permanent Adhesives – The solvent cement supplied by the conduit manufacturers will be used to produce a rigid sealed connection.

No. 2 - Flexible Adhesives – A non-hardening adhesive supplied by the conduit manufacturers will be used to produce a flexible sealed joint where allowance is necessary for longitudinal movement (e.g. expansion couplers).

JOINTS (CONT'D)

Conduits will be joined and terminated utilizing the appropriate rigid polyvinyl chloride compounds as detailed below or standard conduit entry electrical equipment. Jointing will conform to one of the following techniques:-

(a) PERMANENT ADHESIVES

The solvent cement supplied by the conduit manufacturers will be used to produce a rigid sealed connection.

(b) FLEXIBLE ADHESIVE

A non-hardening adhesive supplied by the conduit manufacturers will be used to produce a flexible sealed joint where allowance is necessary for longitudinal movement (e.g. expansion couplers)

A. BENDS

Bends and sets in the conduit will be made in accordance with the manufacturer's instructions. The radius of the bend shall not be less than 2.5 times the outside diameter of the conduit, or such greater radius which will facilitate easy drawing into cables.

B. EXPANSION

Adequate allowance shall be made for longitudinal expansion and contraction of the conduit under normal working temperatures variations as follows: -

- (a) Expansion couplers should be used in straight runs exceeding 6 metres with a loose or flexible type of joints, (D. above item)
- (b) At the long spout end of the couplers

Where conduits are concealed or laid on structural floors, they shall be secured by a fixed method to be approved by the Engineer. Where it is essential that conduits cross one another in floors, the chases shall be deepened, and the conduits set to create the minimum desirable diversion.

Care shall be taken to ensure that there is no obstruction to cables within the conduits caused by the ingress of plaster, concrete, or other matter. Conduit ends must be cut square and cleaned of burrs.

A. CLEANING AND PAINTING

Having due regard to the destination and climatic conditions under which the plant is to operate, extreme care shall be exercised in the manufacture of the equipment to prevent the formation of any corrosion.

All equipments shall be cleaned of all dust, oil, grease, dirt, scale and rust by power tool operated metal brush or preferably by shot or grit blasting and then ground smooth where necessary.

Unless otherwise approved, they shall then immediately have applied to them two coats of approved primer paint. After inspection, any rough surfaces shall be filled in and smoothed over and further painting in the factory shall be as follows: -

- (a) All interior surfaces of cubicles, kiosks, boxes and the like, containing wiring or other apparatus and internal components of the plant which are despatched to site in an assembled condition, shall be finish painted with at least two coats of white enamel. The final coat shall be white anti-condezzation finish, where so specified.
- (b) The external surface of the panels shall be finished in grey stove enamel to B.S. 381 C shade 631 or other shade as may be approved by the Engineer.
- (c) All interior surface of tanks and other oil filled chambers and external surfaces of piping therein shall be painted finally with an oil resisting coating to the approval of the Engineer.
- (d) All wall and floor mounted junction boxes, loose starter etc., throughout the work shall be finished in grey stove enamel or painted to B.S. 381 C shade 631 or other shade as may be approved by the Engineer.

After all erection has been completed at site the Contractor shall make good all defects in painting and galvanizing which have arisen during transport, storage and erection on site and shall apply one undercoat and one finished coat of gloss paint to B.S. 311 C shad 631 or other shade as may be approved by the Engineer to the external surface of all equipment.

Where galvanized metalwork has been damaged it shall either be repaired by cold galvanizing at site or alternatively, at the discretion of the Engineer, be returned to the manufacturer for re-galvanizing by the process.

DISTRIBUTION BOARDS**A. TYPE AND RATING**

General lighting and power distribution boards shall comply with B.S. 3817, B.S. 5861 and B.S. 214 and shall be of the metal clad pattern, flush mounted, except where otherwise specified on the drawings.

B. CONSTRUCTION

Enclosures shall be substantially constructed from 16 S.W.G. minimum thickness sheet steel having hinged front cover, and Miniature Circuit Breakers and shall be supplied complete with bus-bars, earthing terminal, neutral bars, circuit chart, and blanking plate for any spare ways. The incoming isolator switch shall be integral with the distribution board in consumer's unit only.

C. MINIATURE CIRCUIT BREAKERS

All distribution boards shall be supplied with M.C.B. manufactured to B.S. 3871 and of a rating as specified on the drawings. The circuit breakers shall incorporate both terminal overload and magnetic short circuit tripping, with a tripfree mechanism.

Three phase circuits shall be controlled by integrally manufactured three pole breakers, with one common operating lever. An outer-tripping mechanism shall ensure isolation of all three poles in the event of an overload or short circuit on any one phase.

D. EARTH LEAKAGE CIRCUIT BREAKERS

If specified or indicated on the Contract drawings, the use of E.L.C.B. for isolation of incoming supply in the distribution board, it shall be an approved type for flush mounting. The general requirements of E.L.C.B. are as follows:-

- (a) It shall be high sensitivity i.e. it shall operate in 30 milliseconds for a leakage current of 30 milliamphere.
- (b) Its operation shall not rely on the mains supply for tripping under fault conditions. For example, in the event of a leakage from the live to each conductor occurring at the same time as a break in the neutral supply wire, the breaker shall trip.

ELECTRICAL MATERIALS AND WORKS (CONT'D)**A. LABELLING**

A circuit chart with each board shall show the name, location and current loading of each circuit connected. Each board shall be fitted with an engraved identification label in black and white, such as distribution board D.I. etc., and all three phase boards shall be labelled in white or red, DANGER 415 VOLTS.

B. ERECTION

Conduits for each circuit shall be completely erected before any cable is drawn in. Adequate draw-in points shall be provided.

Straight runs shall have draw-in facilities at distance not exceeding 12 metres. Runs incorporating sets or bends shall have draw-in facilities at a distance not exceeding 9 metres. These distances may need to be reduced in difficult situations or with particular cable complexes.

Not more than four easy sets, or two right angle bends or sets may be installed between draw-in points. Solid elbows or tees shall not be accepted.

FINAL SUB CIRCUIT WIRING**C. TYPE**

All power and lighting wiring cables shall be 600/1000 Volt grade, single core polyvinyl chloride, insulated, with stranded copper conductors, manufactured in accordance with B.S.6004. The minimum sizes on lighting circuits shall be 1.5 sq.mm sizes on power spur circuits shall be 4.0 sq. mm and on ring main circuits 2.5 sq.mm.

D. INSTALLATION

Cables forming sub-circuits connected to different sub-distribution boards shall not be drawn into the same conduit or draw-in box.

Saddles as supplied by the manufacturers shall include a sliding support tolerance for longitudinal expansion.

Special consideration may need to be given to the fixing of accessories where this prevents natural conduit movements. Oversize or slotted fixing holes may be necessary or introduction of expansion couplers.

ELECTRICAL MATERIALS AND WORKS (CONT'D)**A. SUPPORT**

Conduit should be supported by sandles at not less than 900mm intervals. Where working temperature tends to be high this should be reduced to 600mm.

B. CONDUIT BOXES AND FITTINGS

All conduit boxes shall be circular or square pattern of rigid polyvinyl chloride suitable for plain connections conforming to sheet 62 B.S. 4607 part. Boxes for supporting at fitting or accessory shall be fitted with a polyvinyl chloride lid held in position by means of two 2 BA round headed screws. Boxes shall have metallic screwed inserts.

C. P.M.E. SYSTEM

Provision shall be made for the P.M.E system at supply intake (where applicable)

"P.M.E." means that system whereby the neutral conductor of the supply network is earthed at a prescribed number of points along its routes, together with the installation earth continuity conductor, at each consumer's installation, so providing a metallic path for the flow of earth fault currents. The connections between the neutral conductors of the installation shall be made by the Supply Authority at the point of intake only. The connection at the isolators will be made by the Contractor in the presence of the Engineer after completion of all tests.

D. COMMISSIONING

The whole installation shall be tested to the statutory requirements of the Electricity Authority, Institute of Electrical Engineer Regulations and commissioned in the presence of and to the satisfaction of the Engineer.

Four copies of test reports shall be provided within seven days of carrying out the tests, and the reports shall include full details of how each test was carried out, and a copy of all readings taken.

SOCKETS OUTLETS**A. GENERAL**

In all areas, general power outlets shall be of the 13 amps pin fused plug type complying with B.S. 1363. They shall be flush pattern, with white or ivory cover plates unless otherwise specified on the drawings. Where the circuits are supplied from a common feed, two outlets shall form a twin unit in a common box. The earthing terminal of every socket outlet shall be connected to the earth continuity conductor of the final sub-circuit by an appropriately sized insulated copper conductor. Unless otherwise stated they shall be mounted at 300mm above the finished floor level.

B. FUSES

All fused connection units shall be fitted with 12 amp. Fuses, unless otherwise specified.

C. LABELLING

The front plate of each fused connection unit shall, unless otherwise specified be engraved with the name of the appliance connected to it.

LIGHTING SWITCHES**D. TYPE**

Lighting switches shall be of the all-insulated rocker operating plate-switch type to B.S. 3676 of ample rating. Switch inserts shall be white, set in white or ivory cover plates.

Switches controlling points in bathroom shall be placed outside the bathroom or consist of a ceiling switch operated by a non-conducting cord, as specified switches mounted outdoors shall be of a weather tight pattern.

Switches shall be one way, two ways or intermediate as specified and where a number of switches are mounted together, they shall be fitted in common box.

Ceiling switches shall be white or ivory semi recessed pattern and shall only be used where specified. Pull cords shall be fitted with shock absorbing springs.

STEEL LIGHTING**A. KENYA POWER AND LIGHTING SUPPLY**

The Electrical supply shall be derived from Kenya Power and Lighting Company Limited at 240 volts x single phase 50 HZ.

The Electrical Contractor shall submit commencement and completion certificates and application for electrical supply to Kenya Power and Lighting Company Limited and make all the arrangement for the supply to each control pillar.

Provisional Sum is allowed in the Bill for the Kenya Power and Lighting Company Limited's service line charges.

The Electrical Contractor shall allow for all the necessary attendance to Kenya Power and Lighting Company Limited's work.

B. STREET LIGHTING COLUMNS

Street Lighting Columns shall be steel columns conforming to B.S. 1840/1952 having amounting height of 6.00 metres and shall be as shown on the drawings. The columns shall be installed at a minimum depth of 825mm in the ground on a 75mm thick concrete foundation.

After manufacture and before erection the columns shall be treated with an approved mordant solution which shall be washed off and the whole allowed to dry. Thereafter the columns shall be painted with one coat of Leylac enamel and two coats of gloss paint to an approved colour.

C. LANTERNS

Lanterns shall be of the completely enclosed type with antivandal bowl designed for side entry mounting on brackets with a 37mm diameter plain tube. They shall be capable of accommodating one single 125-watt M.B.F./U lamp 3-slot lamp holder connected with heat resisting cable. The lanterns shall be of semi-cut-off type with height output ratio not less than 70% and with incorporated control gear, complete with lamp. Lantern shall be as "THORNBETA 79" or equivalent approval by the City Engineer and the Consulting Engineer. If any alternative, make is to be used the details shall be given at the time of submission of tenders.

A. CABLES

Polyvinyl chloride armoured copper conductors' cable shall be 250/440 volt grade conforming to B.S. 3346/61

4mm² x 2-core P.V.C. wapvc cables shall be used for street lighting installation as indicated on the drawings.

B. DUCTS

Ducts for roads crossing shall be concrete pipes joined in an approved manner, with an internal diameter of not less than 100mm. The ducts shall be laid at least 0.5 metres below the finished road level on a compacted bed of concrete mix 1:3:6 at least 150mm concrete surround.

C. CONTROL PILLAR

The control pillar shall be metal pillar conforming to drawings.

The control pillar shall be erected on 300mm thick bed of concrete mix 1:2:4 and a minimum of 225mm above the ground level in the position indicated on the drawings. The control pillar shall be complete with time switchgear, cut-outs, earth leakage current operated circuit breakers and all associated wiring. The Control Pillar shall be adequately earthed.

D. SYSTEM OF WIRING

Cables shall be 4mm² x 2-core, 3-core pvc wapvc laid with a layer of soft sand underneath and over in a trench 500mm deep along the road approximately 600mm away from the road kerbs. The loop-in and loop-out arrangement shall be through a cut-out mounted in pole windows. Galvanized armoured wires shall be properly earthed and to maintain earth continuity earth clips and connectors to be used. From the cut-out to the lantern 1.5m² pvc insulated by sheathed twin and earth cables shall be used protected by 5A carriage fuse. The lantern shall be earthed separately with otherwise taken from the main point. Cable crossing the road shall be laid in ducts previously specified. The cables laid in trench shall be protected with "HATARI" cable tiles.

No underground joints will be allowed.

A. EARTHING

All poles lanterns and other metal parts shall properly earthed. Electrical and Mechanical continuity shall be preserved throughout the whole systems from the control pillar to the remotest pole and the earth resistance must be efficiently earthed through earth electrodes by means of substantial copper clamps secured by non-rusting bolts. The lead must be visible and adequately protected. No earthing lead shall be less than 6mm² with earth wire may be used.

B. EARTH LEAKAGE CIRCUIT BREAKER

The earth leakage circuit breaker shall be current operated as manufactured by 'CRABTREE' Cat No. 13030/1 with over-current and short circuit protection and shall conform to B.S. 4293.68 rated at 240 volts 50 HZ alternating current.

C. CONSUMER UNITS

These shall be surface mounted 6-way SPN MCB consumer unit as manufactured by 'CRABTREE' Cat No. 206/1 or equivalent with MCB ratings as shown on the drawing.

D. TESTING

The installation when complete shall pass the following tests: -

- (a) Insulation resistance between lines and line/neutral
- (b) Insulation resistance between lines and earth and neutral
- (c) Earth continuity resistance including all fittings
- (d) Polarity check. Contractor shall submit a completion certificate to Kenya Power and Lighting Company Ltd., for electricity connection.

E. RESISTANCE

Test on earth electrode when carried out with earth (null balance) at any point within the network must not exceed 3 ohms.

F. MAINTENANCE

The Contractor shall be responsible for maintenance of equipment for 12 months after substantial completion. He should allow in his price for replacement of defective or burnt out lamps and other equipment.

All works to be carried out to the satisfaction of the Engineer. The Contractor shall be required to carry out all adjustments and improvements to meet the Architect's requirements

SECTION A:

GENERAL MECHANICAL SPECIFICATIONS

SECTION A**GENERAL MECHANICAL SPECIFICATION**

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GENERAL MECHANICAL SPECIFICATION

2.01 General

This section specifies the general requirement for plant, equipment and materials forming part of the Sub-contract Works and shall apply except where specifically stated elsewhere in the Specification or on the Contract Drawings.

2.02 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.

Materials and apparatus required for the complete installation as called for by the Specification and Contract Drawings shall be supplied by the Sub-contractor unless mention is made otherwise.

Materials and apparatus supplied by others for installation and connection by the Sub-contractor shall be carefully examined on receipt. 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.

2.03 Regulations and Standards

The Sub-contract Works shall comply with the current editions of the following:

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

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2.04 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 and connections to equipment shall form part of this Sub-contract and be the responsibility of the Sub-contractor.

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 the Kenya Power and Lighting Company (KPLC) 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 240Volts, 50Hz, 1-phase.

Any equipment that is not rated for the above voltages and frequencies shall be rejected by the Engineer.

2.05 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 Engineer 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.

2.06 Site Supervision

The Sub-contractor shall ensure that there is an English-speaking supervisor on the site at all times during normal working hours.

2.07 Installation

Installation of all special plant and 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 2.03 of this Section.

2.08 Testing**2.08.1 General**

The Sub-contractor's attention is drawn to Part 'C' Clause 1.38 of the "Preliminaries and General Conditions".

2.08.2 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 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 specially manufactured for the plant and equipment specified is used, then the Sub-contractor shall submit satisfactory evidence to the Engineer 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.

2.08.3 Manufactured Plant and Equipment – Work Tests

The rights of the Engineer 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 week's notice to the Engineer of the manufacturer's intention to carry out such tests and inspections.

The Engineer or his representative shall be entitled to witness such tests and inspections. The cost 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 Engineer 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 Engineer 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 Engineer at the Sub-contractor's expense.

2.08.4 Pressure Testing

All pipe work installations shall be pressure tested in accordance with the requirements of the various sections of this Specification. The installations may be tested in sections to suit the progress of the works but all tests must be carried out before the work is buried or concealed behind building finishes. All tests must be witnessed by the Engineer or his representative and the Sub-contractor shall give 48 hours notice to the Engineer of his intention to carry out such tests.

Any pipe work that is buried or concealed before witnessed pressure 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 Engineer and shall keep a progressive and up-to-date record of the section of the work that has been tested.

2.09 Colour Coding

Unless stated otherwise in the Particular Specification all pipe work shall be color coded in accordance with the latest edition of B.S 1710 and to the approval of the Engineer or Architect.

2.10 Welding

2.10.1 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 imperfection due to shearing or flame cutting operation, etc., and shall be free from rust scale, grease and other foreign matter.

2.10.2 Method

All welding shall be carried out by the electric arc processing 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.

2.10.3 Welding Code and Construction

All welded joints shall be carried out in accordance with the following Specifications:

a) Pipe Welding

All pipe welds shall be carried out in accordance with the requirements of B.S.806.

b) General Welding

All welding of mild steel components other than pipework shall comply with the general requirements of B.S. 1856.

2.10.4 Welders Qualifications

Any welder employed on this Sub-contractor shall have passed the trade tests as laid down by the Government of Kenya.

The Engineer may require to see the appropriate certificate obtained by any welder and should it be proved that the welder does not have the necessary qualifications the Engineer may instruct the Sub- contractor to replace him by a qualified welder.

SECTION B:

**PARTICULAR SPECIFICATIONS FOR
PLUMBING AND DRAINAGE**

PARTICULAR PLUMBING AND DRAINAGE SPECIFICATIONS

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PARTICULAR SPECIFICATIONS FOR PLUMBING AND DRAINAGE**3.1 GENERAL**

This section specifies the general requirements for plant, equipment and materials forming part of the plumbing and drainage installations.

3.2 MATERIALS AND STANDARDS**3.2.1 Pipe work and Fittings**

Pipe work materials are to be used as follows:

a) PP-R Pipe-work

PP-R pipe-work upto 63mm bore shall be manufactured in accordance with the current British Standards i.e. DIN 8077 and DIN 8078 for PN 20 tubing, with metallic joints to DIN 8076, joints and fittings for tubings to DIN 16962. All threaded inserts in the fittings and joints shall be made of nickel brass OT58 and are turned from bars and manufactured in accordance with DVGW 534E.

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

b) Galvanized Steel Pipe work

Galvanized steel pipe work up to 65mm nominal bore shall be manufactured in accordance with B.S. 1387 Medium Grade, with tapered pipe threads in accordance with B.S. 21. All fittings shall be malleable iron and manufactured in accordance with B.S. 143.

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

Galvanized 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 jointing of pipes to valves and other items of plant. All flanges shall comply with the requirements of B.S. 10 to the relevant classifications contained hereinafter under Section 'C' of the Specification.

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

c) Copper Tubing

All copper tubing shall be manufactured in accordance with B.S. 2871 from C.160 'Phosphorous De-oxidized Non-Arsenical Copper' in accordance with B.S. 1172.

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

Short copper connection tubes between galvanized pipe work and sanitary fittings shall not be used because of the risk of galvanic action.

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

d) P.V.C. (Hard) Pressure Pipes and Fittings

All P.V.C. pipes and fittings shall be manufactured in accordance with B.S. 3505: 1968.

Jointing

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

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 practical after laying and when the pipeline is adequately anchored. Precautions shall be taken to eliminate all air from the test section and to fill the pipe slowly to avoid risk of damage due to surge.

e) A.B.S. Waste System

Where indicated on the Drawings and Schedules, the Sub-contractor shall supply and fix A.B.S. waste pipes and fittings.

The pipes, traps and fittings shall be in accordance with the relevant British Standards, including B.S. 3943, and fixed generally in accordance with manufacturer's instructions and B.S. 5572: 1978.

Jointing of pipes shall be carried out by means of solvent welding, the manufacturer's instructions and B.S. 5572: 1978.

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

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

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

f) PVC Soil System

The Sub-contractor shall supply and fix PVC soil pipes and fittings as indicated on the Drawings and Schedules. Pipes and fittings shall be in accordance with relevant British Standards, including B.S. 4514 and fixed to the manufacturer's instructions and B.S. 5572.

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

Connections to WC pans shall be effected by the use of a WC connector, gasket and cover, fixed to suit pan outlet.

Suitable supporting brackets and pipe clips shall be provided at maximum of one metre centres. The Sub-contractor shall be responsible for the joint into the Gully Trap on Drain as indicated on the Drawings.

3.2.2 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 the requirements of B.S.1010.

a) Gate Valves

All gate valves 80mm nominal bore and above, other than those required for fitting to buried water mains shall be of cast iron construction, in accordance with the requirements of B.S. 3464. All gate valves required for fitting to 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 65mm nominal bore shall be of bronze construction in accordance with the requirements of B.S.3061.

The pressure classification of all globe valves shall depend upon the pressure conditions pertaining to the site of works.

3.2.3 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.

MECHANICAL INSTALLATIONS

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-Syphon Traps

Where anti-syphon traps are specified, these shall be similar or equal to the range of traps manufactured by Greenwood and Hughes Limited, Deacon Works Littlehampton, Sussex, England.

The trade name for traps manufactured by this company is ‘Grevak’.

3.2.4 Pipe Supports

a) General

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

The variety and type of support shall be kept to a 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 damage to builders work associated with the pipe support installation.

The Sub-contractor shall submit all his proposals for pipe supports to the Engineer for approval before any erection works commence.

b) PP-R Pipe-work

PP-R pipe-work upto 63mm bore shall be manufactured in accordance with the current British Standards i.e. DIN 8077 and DIN 8078 for PN 20 tubing, with metallic joints to DIN 8076, joints and fittings for tubings to DIN 16962. All threaded inserts in the fittings and joints shall be made of nickel brass OT58 and are turned from bars and manufactured in accordance with DVGW 534E.

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

c) Steel and Copper Pipes and Tubes

Pipe runs shall be secured by clips connected to pipeangers, 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.

MECHANICAL INSTALLATIONS

TRADE PREAMBLES

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

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

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

d) Expansion Joints and Anchors

Where practicable, cold pipework 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.

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

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

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

MECHANICAL INSTALLATIONS

TRADE PREAMBLES

3.2.5 Sanitary Appliances

All sanitary appliances supplied and installed as part of the Sub-contract works shall comply with the general requirements of B.S. Code of Practice 305 and the particular requirements of the latest B.S. Specifications.

3.2.6 Pipe Sleeves

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

3.3 INSTALLATION

3.3.1 General

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

3.3.2 Above Ground Installation

a) Water Services

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

Where falls are not shown on the Contract Drawings or stated elsewhere in the Specification, pipework shall be installed parallel to the lines 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 user equipment shall be installed with adequate access for operation and maintenance. Where valves and other operational equipment are unavoidably installed beyond normal reach or in such position as to be difficult to reach from a small step ladder, extension spindles with floor or wall pedestals shall be provided.

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

Full allowances shall be made for the expansion and contraction of pipework, precautions being taken to ensure that any force produced by the pipe movements are not transmitted to valves, equipment or plant. All screwed joints to piping and fittings shall be made with P.T.F.E. tape.

The test pressure shall be maintained by the pump for about one hour and if there is any leakage, it shall be measured by the quantity of water pumped into the main in that time. A general leakage of 4.5 litres per 25mm of diameter, per 1.6 kilometres per 24 hours per 30 metres head, may be considered reasonable but any visible individual leak shall be repaired.

b) Sanitary Services

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

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

The Sub-contractor shall provide all necessary rodding and inspection facilities within the draining system in positions where easy accessibility is available.

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

The vent stacks shall terminate above roof level and where stack passes through roof, a weather skirt shall be provided. The 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 C.P. 305 to the approval of the Engineer.

3.4 TESTING AND INSPECTION

3.4.1 Site Tests – Pipework Systems

a) Above Ground Internal Water Services Installation

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

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

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

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

e) 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 respects, tests shall comply with the requirements of B.S. 5572.

3.4.2 Site Test – Performance

Following satisfactory pressure test on the pipework 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 pipework shall be installed with pre-formed fibre glass lagging to a thickness of 25mm where the pipe runs above a false ceiling or in areas where the ambient temperature is higher than normal with the result that pipe "sweating", due to condensation will cause nuisance.

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

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

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 banded in colours to be approved by the Engineer.

In all respects, unless otherwise stated, the hot and cold water installation shall be carried out in accordance with the best standard of modern practice 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 of 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 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.

3.5 STERILISATION OF COLD WATER SYSTEM

All water distribution system shall be thoroughly sterilised and flushed out after the completion of all tests and before being fully commissioned for handover.

The sterilisation procedures shall be carried out by the Sub-contractor in accordance with the requirements of B.S. Code of Practice 301, Clause 409 and to the approval of the Engineer.

SECTION C:

**PARTICULAR SPECIFICATION FOR PORTABLE FIRE
EXTINGUISHER BOOSTED HOSE REEL SYSTEM AND FIRE
SPRINKLER SYSTEM**

1.0 PORTABLE FIRE EXTINGUISHER AND HOSE REEL INSTALLATIONS

1.1 General

The particular specification details the requirements for the supply and installation and commissioning of the Portable Fire Extinguishers, Hose Reel, Fire Hydrant and Dry Riser. 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.

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.

1.2 Scope of Works

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

1.3 Water/CO2 Extinguishers

These shall be 9-litre water filled CO2 cartridge operated portable fire extinguishers and shall comply with B.S. 1382: 1948 and to the requirements of B.S.4523: 1977. Unless manufactured with stainless steel, bodies shall have all internal surfaces completely coated with either a lead tin, lead alloy or zinc applied by hot dipping. There shall be no visibly uncoated areas.

The extinguishers shall be clearly marked with the following:

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

1.4 Portable Carbon Dioxide Fire Extinguishers

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

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

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

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

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

The following markings shall be applied to the extinguishers:-

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

1.5 Dry Chemical Powder Portable Fire Extinguisher

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

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

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

The extinguisher shall be clearly marked with the following information

- a) The word “Dry Powder Fire Extinguisher”
- b) Method of operation in prominent letters.
- c) The working pressure and the weight of the powder charge in Kilogramme.
- d) Manufacturers name or identification mark
- e) The words “RECHARGE AFTER USE” if rechargeable type.

- f) Instructions to regularly check the weight of the pressure container (gas Cartridge) or inspect the pressure indicator on stored pressure types when fitted, and remedy any loss indicated by either.
- g) The year of manufacture.
- h) The Pressure to which the extinguisher was tested.
- i) The number of this British Standard BS 3465 or BS 5423: 1977.
- j) When appropriate complete instructions for charging the extinguisher shall be clearly marked on the extinguisher or otherwise be supplied with the refill.

1.6 Air Foam Fire Extinguisher

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

Cylinder:	to B.S. 1449
Necking:	to be 76mm outside diameter steel EN 3A 2 ³ / ₄ X 8TPI female thread.
Head cap:	to be plastic moulding acetyl resin.
CO₂ Cylinder:	to be 75gm P.V.C coated.
Internal Finish:	to be polythene lining on phosphate coating.
External finish:	to be phosphated - One coat primer paint and one coat stove enamel B.S. 381 C.

1.7 Fire Blanket

The fire blanket shall be made from cloth woven with pre-asbestos yarn or any other fireproof material and to measure 1800 x 1210 mm and shall be fitted with special tapes folded so as to offer instantaneous single action to release blanket from storing jacket.

2.0 Boosted Hose Reel System

2.1 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: 1976, B.S 5041 and B.S 5274. The System shall comprise of a pumped system.

2.2 Hose Reel Pumps

The fire hose reel pumps shall consist of a duplicate set of multi-line centrifugal pumps from approved manufacturers. The pumps shall be capable of delivering 0.76 lit/sec at a running pressure of 2 bars.

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

2.3 Control Panel

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

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

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

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

2.3.1 Hose Reel

The hose reel to the installation shall consist of a recessed, swing-type hose reel as Angus Fire Armour Model III or from other approved manufacturers.

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

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

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

The hose reels shall be installed complete with electro-galvanized cabinet recessed on the wall.

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

2.3.2 Pipe Work

The pipe work for the hose reel installation shall be galvanized wrought steel tubing heavy grade Class B to B.S 1387: 1967 with pipe threads to B.S 21. The pipe work and all associated fittings shall be in approved colour for fire fittings.

2.3.3 Pipe Fittings

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

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

2.3.4 Non-return Valves

The non-return valves up to and including 80mm diameter shall be to B.S. 5153: 1974. The valves shall be of cast iron construction with gunmetal seat and bronze hinge pin.

2.3.5 Gate Valves

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

2.3.6 Sleeves

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

2.3.7 Earthing

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

2.3.8 Finish Painting

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

2.3.9 Testing and Commissioning

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

2.3.10 Instruction Period

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

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

2.0 Signage-Fire Instruction /Fire Exit

2.1 Fire Instruction Notice

Print fire instruction on the Perspex plates with White Colour

Background measuring 510mm length x 380mm width x 4mm thick as follows;

FIRE INSTRUCTION NOTICE

In the event of fire;

1. Raise the alarm by actuating the nearest alarm system point, Sound Siren /gong or **Shout Fire**
2. Attack fire using the nearest available equipment.
3. Call nearest fire Brigade or Police 999 and inform your switchboard (PABX) Operator
4. Ensure that all personnel not involved in fire fighting evacuation to safety outside the building.
5. Close but **DO NOT LOCK** doors behind as you leave.
6. Evacuate the building using stairs or fire escapes. Do not use Lifts/escalators. Walk calmly. Avoid panic. Do not stop or return for personal belongings.
7. Assemble as per floor outside the building for roll call.

2.1.1.1 Fire Exit Sign

Print Fire Exit signs on the Perspex plate, 4mm thick, with white colour background as follows:-

1. Lettering **IN RED COLOR** of not less than 50mm in height.
2. A pendant sign bearing words, **FIRE EXIT** and with a directional arrow.

The sign must be capable of being read from both approaches to exit and so is double sided.

2.1.1.2 Hose Reel Label

Print Fire Exit signs on the Perspex plate, 4mm thick, with white colour background as follows:-

1. Lettering **IN RED COLOR** of not less than 50mm in height.
2. A pendant sign bearing words, **HOSE REEL** and with a directional arrow.

The sign must be capable of being read from both approaches to exit and so is double sided.

4.0 The Dry Riser Installation

4.1 Definition

MECHANICAL INSTALLATIONS

TRADE PREAMBLES

Dry riser installation is a system where a pipe is installed vertically through a building with an inlet breeching provided at a street level through which the fire brigade can pump water.

4.2 Installation

The dry riser is installed with Fire Brigade Breeching inlet installed at street level in front of the building at a position where fire brigade can access and pump water into the building. Landing valves are then installed on each floor above the ground level to which the fire brigade can attach fire fighting hoses.

4.3 Landing Valves

The Hydrant outlets shall comply with the requirements of C.P 5306 Part 1:1976 and B.S 5041 Part 1. The hydrant Riser outlets shall be 2 No minimum per floor including the roof and shall be mounted with their centre line between 910mm and 1060mm above finished floor level positioned at the entry lobby on each floor.

4.4 Fire Brigade Breeching Inlets

One of the Brigade Breeching inlets shall consist of four (4 No.) 64mm internal diameter instantaneous male coupling for connection to the fire brigade pumps and other two shall consist of two (2 No.) 64mm internal diameter instantaneous male coupling.

The breeching inlet shall incorporate a 100mm diameter flanged connection to the 100mm dry riser mains.

The breeching inlet shall be located 1000mm to the centre line of the box above ground level.

The breeching inlet shall be enclosed in a galvanized mild steel cabinet of suitable dimensions to contain all visible pipe work. A 7.5mm thick wired glass front shall be provided with 50mm high, red lettering, **DRY RISER BREECHING CONNECTOR**. The remainder of the box is to be finished in fire red enamel paint.

4.5 Pipework

The pipe work fittings shall be wrought steel pipe fittings welded or seamless fittings conforming to B.S 1740 Part 1971 or malleable iron fittings to B.S 193.

All changes in direction will be standard bends or long radius fittings. **No elbows will be permitted.**

4.6 Flanges

The flanges shall comply with B.S 4504:1969. All flanges shall comply with a nominal Pressure Rating of 16 bars and shall be of either grey cast iron or steel.

4.7 Gaskets

The gaskets for use with flanges to B.S 4504: 1969 shall comply with B.S 4865 Part 1: 1972 for pressure up to 64 bars.

4.8 Air Relief Valves

The dry riser shall terminate 1M above the roof landing valve with an air relief valve. The valve construction shall be of iron Grade E conforming to B.S 1452. Float Guide and Seat Ring shall be of A.B.S plastic with seal ring of moulded rubber, Maximum working pressure of the valve is to be 16 bar.

4.9 Non-Return Valves

The non-return valves up to and including 80mm diameter shall conform to B.S 5153:1974 with flanges to B.S 4504 PN 16. The valves shall be of cast iron construction with gunmetal seat and disc with spring of phosphor bronze.

Non return valves exceeding 80mm diameter and up to 300mm diameter shall conform to B.S 5153:1974 with flanges to B.S 4504 PN 16. The valve shall be of Cast Iron Construction with Gunmetal seat to B.S 1400.

4.10 Gate Valves

The gate valves up to and including 80mm shall be non-rising stem and wedge disc to B.S. 1952:1964 (B.S 5154:1974) with screwed threads to B.S.21(KS ISO 7 – 1) tapertthread. The valves shall be of high-grade bronze construction.

Gate valves exceeding 80mm and up to 300mm shall be to B.S 5163 with flanges to B.S 4504 PN 16. The valve is to be double flanged cast iron wedge gate valve for water works purposes with cast iron body to B.S 1452 GRADE 14 with rubber covered cast iron gate. The stem is to be of Forged Stainless Steel to B.S 970 with cast iron hand wheel.

4.11 Sleeves

Where Pipework pass through walls or floors or ceiling a sleeve shall be provided one diameter larger than the diameter of the pipe the space between to be the packed with mineral wool, to the Engineers approval.

4.12 Floor and Ceiling Plates

Where pipes pass through floors, walls and ceilings, floor, wall and ceilings plates shall be secured around the pipe. The plated shall be of stainless-steel construction and will serve no other purpose than to present a neat finish to the exposed installations.

4.13 Earthing

The dry riser shall be electrically earthed by a direct earth connection. The installation of the earthing to be carried out by the electrical Sub-Contractor.

4.14 Finish Painting

Upon completion, testing and commissioning of the dry rise installation the pipe work shall be primed, and finish painted with 2No. Coats of paint by the Sub-Contractor to the Engineer's requirements.

4.15 Testing and Commissioning

The installation is to be tested to one and half times the working pressure of the installation, all to the approval of the Engineer. The pressure shall be maintained for about 1 hour ensuring that there is no change in pressure is observed.

4.16 Canvas Hose

The canvas hose shall be 65mm diameter 30m long designed for a bursting pressure of 34bars. The canvas hose shall have attached instantaneous hose coupling, branch pipes and nozzle to B.S 336: 1965.

4.17 Hose Cradle

The hose cradle shall be a high-quality fitting designed for use in public buildings. The cradle **shall be made in aluminium** throughout and shall be supplied with a wall bracket and the finish shall be polished or chrome plated.

5.0 Fire Hydrant

5.1 Fire Hydrant Details

5.1.1 Definition

The fire hydrant is a system which is installed along the water mains to used as a means of providing water to the fire brigades through the connection of the hose from a standpipe.

5.1.2 Installation

The fire hydrants are installed along the water mains with the first hydrant at a location which is not more than 60 m from the entry of any building, and they should not be more than 120 m apart.

5.1.3 Hydrant body

The body of the hydrant shall be made of grey cast iron complying with the requirements of BS 1452 having a tensile strength not less than that given for grade 14.

5.1.4 Hydrant Valve

The valve shall be faced with suitable resilient material. The threaded part of the valve, which engages with the spindle, shall be of bronze.

Body seating for the valves shall be of copper alloy complying with the requirements of BS 1400 (KS 06 – 744 – 1:1991) or high tensile brass complying with the requirements of BS 2872 or BS 2874.

Turning the spindle cap in a clockwise direction when viewed from above shall close valves and the direction of opening shall be permanently marked on the gland.

5.1.5 Spindle & Spindle Cap

The spindle note shall be either of the same material as the spindle, or of copper alloy complying with the requirements of BS 1400 (KS 06 – 744 – 1:1991). It shall have a squared top formed to receive either a cast iron spindle cap.

The spindle shall be made of copper alloy complying with the requirements of BS 2874 (KS 06 – 744 – 1:1991), and it shall have a threaded machined of trapezoidal form. The spindle cap shall be of a cast iron secured to the spindle by on M12 hexagon socket set screw conforming to BS 4168.

5.1.6 Hydrant Outlet

The outlet flange of the hydrant shall have above nominal diameter 65mm, and shall be fitted with a screwed outlet – Both flanges shall be 50 mm conforming to BS 4504: Part 1: 1969

The screwed outlet shall be provided with a cap of cast iron or other suitable material. The cap shall cover the outlet thread completely and shall be attached to the hydrant by a chain

The distance between the axis of the outlet and the nearest point on the spindle fitting shall be not less than 100 mm.

The screwed outlet shall be made of Copper alloy to BS 1400 (KS 06 – 744 – 1:1991), or Copper alloy to BS 2872, or Suitable Spheroidal graphite iron to BS 2789 protected against corrosion accordance with CP 2008.

5.1.7 Drain Boss

Each shall be provided with a suitable drain boss on the outlet side. This shall be located at the lowest practical point which will permit the filling of self-operating a drilled drip plug.

5.1.8 Jointing

The hydrants shall have machined joint faces through out and the fitting of adjoining parts shall be such as to make sound joints, corresponding parts of hydrants of the same design and manufacture shall be interchangeable.

5.1.9 Hydrant coating

The hydrant shall be coated in accordance to BS. 4164.

5.1.10 Surface Box

The clear opening of hydrant surface boxes at ground level shall not be less than 250mmx 380mm.

The depth of frame shall normally be:

- a) For boxes located on footpaths: 100mm
- b) For boxes located in roads: 125mm

5.1.11 Marking

Surface box covers shall be clearly marked by having the words ‘**FIRE HYDRANT**’ in letter not less than 30mm high, or the initials ‘**FH**’ in letters not less than 75mm high cost into the cover.

5.1.12 Surface Box Covers & Frames

The surface box frames and covers shall be graded in accordance with BS 497:1967 and shall meet the loading test requirement also given in BS 497.

5.2 Standpipes

One end of these shall have internal threads to couple with the 80mm diameter external threads of the screw down type or above ground fire Hydrant (BS 750 type 2 hydrants) outlet. It shall have 65mm diameter internal threads to couple with the interconnect or hose of the pump set.

5.3 Hose Pipe

Each cotton synthetic fibre rubberized fire hosepipe to be at least 30 metres long with 65mm diameter female instantaneous type connector complete with nozzle.

5.4 Testing

The hydrants shall be deemed to have undergone the necessary hydrostatic and flow test at time of manufacture. Necessary test certificates from the manufacturer shall be needed. The test, to conform to BS 750: 1977:

SECTION D:

BILLS OF QUANTITIES AND

SCHEDULE OF UNIT RATES

BILLS OF QUANTITIES AND SCHEDULE OF UNIT RATES

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SECTION A
GENERAL SPECIFICATIONS OF
MATERIALS AND WORKS

GENERAL SPECIFICATIONS OF MATERIALS AND WORKS

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2.1 GENERAL

This specification is to be read in conjunction with the drawings which are issued with it. Bills of quantities shall be the basis of all additions and omissions during the progress of the works.

2.2 STANDARD OF MATERIALS

Where the material and equipment are specifically described and named in the Specification followed by approved equal, they are so named or described for the purpose of establishing a standard to which the sub-contractor shall adhere.

Should the Sub-contractor install any material not specified herein before receiving approval from the proper authorities, the Engineer shall direct the Sub-contractor to remove the material in question immediately. The fact that this material has been installed shall have no bearing or influence on the decision by the Engineer.

All materials condemned by the Engineer as not approved for use, are to be removed from the premises and suitable materials delivered and installed in their place at the expense of the Sub-contractor. All materials required for the works shall be new and the best of the respective kind and shall be of a uniform pattern.

2.3 WORKMANSHIP

The workmanship and method of installation shall conform to the best standard practice. All work shall be performed by a skilled tradesman and to the satisfaction of the Engineer. Helpers shall have qualified supervision.

Any work that does not in the opinion of the Engineer conform to the best standard practice will be removed and reinstated at the Sub-contractor's expense.

Permits, Certificates or Licenses must be held by all tradesmen for the type of work; in which they are involved where such permits, certificates or licenses exist under Government legislation.

2.4 PROCUREMENT OF MATERIALS

The sub-contractor is advised that no assistance can be given in the procurement or allotment of any materials or products to be used in and necessary for the construction and completion of the work.

Sub-contractors are warned that they must make their own arrangements for the supply of materials and/or products specified or required.

2.5 SHOP DRAWINGS

Before manufacture or Fabrication is commenced the sub-contractor shall submit Two copies of detailed drawings of all control pillars, meter cubicles, medium voltageswitchboards including their components showing all pertinent information including sizes, capacities, construction details, etc., as may be required to determine the suitabilityof the equipment for the approval of the Engineer. Approval of the detailed drawings shall not relieve the sub-contractor of the full responsibility of errors or the necessity ofchecking the drawings himself or of furnishing the materials and equipment andperforming the work required by the plans and specifications.

2.6 RECORD DRAWINGS

These diagrams and drawings shall show the completed installation including sizes, runsand arrangements of the installation. The drawings shall be to scale not less than 1:50and shall include plan views and section.

The drawings shall include all the details which may be useful in the operation, maintenance or subsequent modifications or extensions to the installation.

Three sets of diagrams and drawings shall be provided, all to the approval of the Engineer.

One coloured set of line diagrams relating to operating and maintenance instructions shall be framed and, mounted in a suitable location.

2.7 REGULATIONS AND STANDARDS

All work executed by the Sub-contractor shall comply with the current edition of the “Regulations” for the Electrical Equipment of Buildings, issued by the Institution of Electrical Engineers, and with the Regulations of the Local Electricity Authority.

Where the two sets of regulations appear to conflict, they shall be clarified with the Engineers. All materials used shall comply with relevant Kenya Bureau of Standards Specification.

2.8 SETTING OUT WORK

The sub-contractor at his own expenses; is to set out works and take all measurementsand dimensions required for the erection of his materials on site; making any modifications in details as may be found necessary during the progress of the works, submitting any such modifications or alterations in detail to the Engineer beforeproceeding and must allow in his Tender for all such modifications and for the provision of any such sketches or drawings related thereto.

2.9 POSITIONS OF ELECTRICAL PLANT AND APPARATUS

The routes of cables and approximate positions of switchboards etc, as shown on the drawings shall be assumed to be correct for purpose of Tendering, but exact positions of all electrical Equipment and routes of cables must be agreed on site with the Engineer before any work is carried out.

2.10 MCB DISTRIBUTION PANELS AND CONSUMER UNITS

All cases of MCB Panels and consumer units shall be constructed in heavy gauge sheet with hinged covers.

Removable undrilled gland plates shall be provided on the top and bottom of the cases. Miniature circuit breakers shall be enclosed in moulded plastic with the tripping mechanism and arc chambers separated and sealed from the cable terminals.

The operating dolly shall be tripfree with a positive movement in both make and break position. Clear indication of the position of the handle shall be incorporated.

The tripping mechanism shall be on inverse characteristic to prevent tripping intemporary overloads and shall not be affected by normal variation in ambient temperature.

A locking plate shall be provided for each size of breaker; A complete list of circuit details on typed cartridge paper glued to stiff cardboards and covered with a sheet of Perspex, and held in position with four suitable fixings, shall be fitted to the inner face of the lids of each distribution panel. The appropriate MCB ratings shall be stated on the circuit chart against each circuit in use: Ivorine labels shall be secured to the insulation barriers in such a manner as to indicate the number of the circuits shown on the circuit chart. Insulated barriers shall be fitted between phases, and neutrals in all boards, and to shroud live parts.

Neutral cables shall be connected to the neutral bar in the same sequence as the phase cables are connected to the MCB's. This shall also apply to earth bars when installed.

2.11 FUSED SWITCHGEAR AND ISOLATORS

All fused switchgear and isolators whether mounted on machinery, walls or industrial panels shall conform to the requirements of KS 04 – 226 PART: 1: 1985.

All contacts are to be fully shrouded and are to have a breaking capacity on manual operations as required by KS 04 – 182: 1980.

Fuse links for fused switches are to be of high rupturing capacity cartridge type, conforming to KS 04 – 183: 1978.

Isolators shall be load breaking/fault making isolators.

Fused switches and isolators are to have separate metal enclosures. Mechanical interlocks are to be provided between the door and main switch operating mechanism so arranged that the door may not be opened with the switch in the 'ON' position. Similarly; it shall not be possible to close the switch with the door open except that provision to defeat the mechanical interlock and close the switch with the door in the open position for test purposes. The 'ON' and 'OFF' positions of all switches and isolators shall be clearly indicated by a mechanical flag indicator or similar device. In T.P & N fused switch units, bolted neutral links are to be fitted.

2.12 CONDUITS AND CONDUIT RUNS

Conduit systems are to be installed so as to allow the loop-in system of wiring:

All conduits shall be black rigid super high impact heavy gauge class 'A' PVC in accordance with KS 04 – 179: 1988 and IEE Regulations. No conduit less than 20mm in diameter shall be used anywhere in this installation.

Conduit shall be installed buried in plaster work and floor screed except when run on wooden or metal surface when they will be installed surface supported with saddles every 600mm. Conduit run in chases shall be firmly held in position by means of substantial pipe hooks driven into wooden plugs.

The Sub-contractor's attention is drawn to the necessity of keeping all conduits entirely separate from other piping services such as water and no circuit connections will be permitted between conduits and such pipes. All conduits systems shall be arranged wherever possible to be self-draining to switch boxes and conduit outlet points for fittings:

The systems, when installed and before wiring shall be kept plugged with well fitting plugs and when short conduit pieces are used as plugs, they shall be doubled over and tied firmly together with steel wire; before wiring all conduit systems shall be carried out until the particular section of the conduit installation is complete in every respect.

The sets and bends in conduit runs are to be formed on site using appropriate size bending springs and all radii of bends must not be less than 2.5 times the outside diameter of the conduit. No solid or inspection bends, tees or elbows will be used.

Conduit connections shall either be by a demountable (screwed up) assembly or adhesive fixed and watertight by solution. The tube and fittings must be clean and free of all grease before applying the adhesive. When connections are made between the conduit and switch boxes, circular or non-screwed boxes, care shall be taken that no rough edges of conduit stick out into the boxes.

Runs between draw in boxes are not to have more than two right angle bends or their equivalent. The sub-contractor may be required to demonstrate to the Engineers that wiring in any particular run is easily withdrawable and the sub-contractor may, at no extra cost to the contract; be required to install additional draw-in boxes required. If conduit is installed in straight runs in excess of 6000mm, expansion couplings as manufactured by Egatube shall be used at intervals of 6000mm.

Where conduit runs are to be concealed in pillars and beams, the approval of the Structural Engineer, shall be obtained. The sub-contractor shall be responsible for marking the accurate position of all holes chases etc, on site, or if the Engineer so directs, shall provide the Main Contractor with dimensional drawings to enable him to mark out and form all holes and chases. Should the sub-contractor fail to inform the main contractor of any inaccuracies in this respect they shall be rectified at the sub-contractor's expense.

It will be the Sub-contractor's responsibility to ascertain from site, the details of reinforced concrete or structural steelwork and check from the builder's drawings the positions of walls, structural concrete and finishes. No reinforced concrete or steelwork may be drilled without first obtaining the written permission of the Structural Engineer.

The drawings provided with these specifications indicate the appropriate positions only of points and switches, and it shall be the Sub-Contractors responsibility to mark out and centre on site the accurate positions where necessary in consultation with the Architect and the Engineer. The sub-contractor alone shall be responsible for the accuracy of the final position.

2.13 CONDUIT BOXES AND ACCESSORIES

All conduit outlets and junction boxes are to be either malleable iron and of standard circular pattern of the appropriate type to suit saddles being used or super high impact PVC manufactured to KS 04 – 179 : 1983.

Small circular pattern boxes are to be used with conduits up to and including 25mm outside diameter. Rectangular pattern adaptable boxes are to be used for conduits of 32mm outside diameter and larger. For drawing in of cables in exposed runs of conduit, standard pattern through boxes are to be used:

Boxes are to be not less than 50mm deep and of such dimensions as will enable the largest appropriate number of cables for the conduit sizes to be drawn in without excessive bending.

Outlet boxes for lighting fittings are to be of the loop-in type where conduit installation is concealed and the sub-contractor shall allow one such box per fitting, except where fluorescent fittings are specified when two such boxes per fitting shall be fitted flush with ceiling and if necessary fitted with break joint rings. Pattresses shall be fitted where required to outlets on surface conduit runs.

Adaptable boxes are two of PVC or mild steel (of not less than 12swg) and black enamelled or galvanised finish according to location. They shall be of square or oblong shape location. They shall be of square or oblong shape complete with lids secured by four 2 BA brass roundhead screws; No adaptable box shall be less than 75mm x 75mm x 50mm or larger than 300mm x 300mm x 75mm and shall be adequate in depth in relation to the size of conduit entering it. Conduits shall only enter boxes by means of conduit bushes.

2.14 LABELS

Labels fitted to switches and fuse boards; -

- (i) Shall be Ivory engraved black on white.
- (ii) Shall be secured by R.H brass screws of same manufacturing throughout.
- (iii) Shall be indicated on switches: -
 - a) Reference number of switch
 - b) Special current rating
 - c) Item of equipment controlled
- (iv) Shall indicate on MCB panels
 - a) Reference number
 - b) Type of board, i.e.; lighting, sockets, etc.
 - c) Size of cable supplying panel
 - d) where to isolate feeder cable
- (v) Shall be generally not less than 75mm x 50mm.

2.15 EARTHING

The earthing of the installation shall comply with the following requirements; -

- (i) It shall be carried out in accordance with the appropriate sections of the current edition of the Regulations, for the Electrical Equipment of Buildings issued by Institute of Electrical Engineers of Great Britain.

At all main distribution panels and main service positions a 25mm x 3mm minimum cross sectional area Copper tape shall be provided and all equipment including the lead sheath and armouring of cables, distribution boards and metal frames shall be bonded thereto.

- (ii) The earth tape in Sub-clause (ii) shall be connected by means of a copper tape or cable of suitable cross sectional area to an earth electrode which shall be a copper earth rod (see later sub-clause).
- (iii) All tapes to be soft high conductivity copper, untinned except where otherwise specified and where run underground on or through walls, floors, etc., it shall be served with corrosion resisting tape or coated with corrosion compound and braided
- (iv) Where the earth electrode is located outside the building a removable test link shall be provided inside the building as near as possible to the point of entry to the tape, for isolating the earth electrode for testing purposes.
- (v) Earthing of sub-main equipment shall be deemed to be satisfactory where the sub-main cables are M.I.C.S. or conduit with separate earth wire, and installation is carried out in accordance with the figures stated in the current edition of the

I.E.E Regulations.

- (vi) Where an earth rod is specified (see Sub-clause (iii)) it shall be proprietary manufacture, solid hand drawn copper of 15mm diameter driven into the ground to a minimum depth of 3.6M. It shall be made up to 1.2m sections with internal screw and socket joints and fitted with hardened steel tip and driving cap.
- (vii) Earth plates will not be permitted
- (viii) Where an earth rod is used the earth resistance shall be tested in the manner described in the current edition of the IEE Regulations, by the Sub-Contractor in the presence of the Engineer and the Sub-Contractor shall be responsible for the supply of all test equipment.
- (ix) Where copper tape is fixed to the building structure it shall be by means of purpose made non-ferrous saddles which space the conductor away from the structure a minimum distance of 20mm. Fixings, shall be made using purpose made plugs; No fixings requiring holes to be drilled through the tape will be accepted.
- (x) Joints in copper tape shall be tinned before assembly riveted with a minimum of two copper rivets and seated solid.
- (xi) Where holes are drilled in the earth tape for connection to items of equipment the effective cross-sectional area must not be less than required to comply with the IEE regulations.

- (xii) Bolts, nuts and washers for any fixing to the earth tape must be of non-ferrous material.
- (xiii) Attention is drawn to the need for the earthing metal parts of lighting fittings and for bonding ball joint suspension in lighting fittings.

2.16 CABLES AND FLEXIBLE CORDS

All cables used in this Sub-Contract shall be manufactured in accordance with the current appropriate Kenya standard Specification which are as follows: -

P.V.C. Insulated Cables and Flexible Cords	---	Ks 04-192:1988
P.V.C Insulated Armoured Cables	---	Ks 04-194:1990
Armouring of Electric cables	---	Ks 04-290:1987

The successful Sub-Contractor will, at the Engineers discretion be required to submit samples of cables for the Engineers approval; the Engineer reserves the right to call for the cables of an alternative manufacture without any extra cost being incurred.

P.V.C. insulated cables shall be 500/1000-volt grade. No cables smaller than 1.5mm² shall be used unless otherwise specified. The installation and the finish of cables shall be as detailed in later clauses. The colour of cables shall conform to the details stated in the "Cable Braid and insulation Colours" Clause.

2.17 ARMOURED P.V.C. INSULATED AND SHEATHED CABLES:

Shall be 600/1000-volt grade manufactured to Ks 04-194:1988 and Ks 04-187/188 with copper stranded conductors.

The wire armour of the cable shall be used wholly as an earth continuity conductor and the resistance of the wire armour shall have a resistance not more than twice of the largest current carrying conductor of the cable.

P.V.C./S.W.A./P.V.C. cables shall be terminated using "Telecom" "B" type or approved equal or approved equal glands and a P.V.C. tapered sleeve shall be provided to shroud each gland.

2.18 CABLE SUPPORTS, MARKERS AND TILES

All PVC/SWA/PVC cables run inside the building shall be fixed in rising ducts or on ceilings by means of die cast cable hooks or clamps, of appropriate size to suit cables, fixed by studs and back nuts to their channel sections.

Alternatively, fixing shall be by BICC claw type cleating system with die-cast cleats and galvanised mild steel back straps or similar approved equal method. For one or two cables run together the cleats shall be fixed a special channel section supports or backstraps described above which shall in turn be secured to walls or ceilings of ducts by rawbolts.

In excessively damp or corrosive atmospheric conditions special finishes may be required and the Sub-contractor shall apply to the Engineer for further instructions before ordering cleats and channels for such areas.

The above type of hooks and clamps and channels or cleats and backstraps shall also be used for securing cables in vertical ducts.

Cables supports shall be fixed at 600mm maximum intervals, the supports being supplied and erected under this Sub-contract. Saddles shall not be used for supporting cables nor any other type of fixing other than one of the two methods described above or other system which has received prior approval of the Engineer;

Cables are to be kept clear of all pipe work and the Sub-contractor shall work in close liaison with other services Sub-contractors.

The Sub-Contractor shall include for the provision of fixing of approved type coloured slip on cables end markers to indicate permanently the correct phase and neutral colour on all ends.

Provision shall be made for supplying and fixing approved non-corrosive metal cable markers to be attached to the outside of all PVC/SWA/PVC cables at 15mm intervals indicating cable size and distinction.

Where PVC/SWA/PVC cables are outside the building they shall be laid underground 750mm deep with protecting concrete interlocking cover tiles laid over which shall be provided and laid under this Sub-contract.

All necessary excavations and reinstatement of ground including sanding or trenches will be carried out by the Sub-Contractor, unless otherwise stated.

2.19 PVC INSULATED CABLES

Shall be of non-braided type as CMA reference 6491 x 600/1000/1000-volt grade cables, or equal approved.

PVC cables shall conform to the details of the "Cables and Flexible cords" and "Cable Braid and Insulation Colours" clauses.

2.20 HEAT RESISTING CABLES

Final connections to cookers, water heaters, etc., shall be made using butyl rubber insulated cable as CMA reference 610 butyl (Single core 600/1000 Volt).

This type of cable shall be used in all instances where a temperature exceeding 100°F, but not exceeding 150°F is likely to be experienced. Final connections to all lighting fittings (and other equipment where a temperature in excess of 150°C likely to be experienced) shall be made using silicon rubber insulated cable or equal and approved.

2.21 FLEXIBLE CORDS

Shall be in accordance with the "Cable and Flexible Cords" clause. No cord shall be less than 24/0.2mm in size unless otherwise specified.

Circular white twin TRS flex shall be used for plain pendant fittings up to 100 watts. For all other types of lighting fittings, the flexible cable shall be silicone rubber insulated.

No polythene insulated flexible cable shall be used in any lighting fitting or other appliance (see "Heat Resisting Cables" Clause 30).

2.22 CABLE ENDS AND PHASE COLOURS

All cable ends connected up in switchgear, MCB panels etc, shall have the insulation carefully cut back and the ends sealed with Hellerman rubber slip on cable end markers.

The markers shall be of appropriate phase colour for switch and all other live feeds to the details of the "Cable Insulation Colours" clause. Black cable with black end markers shall only be used for neutral cables.

2.23 CABLE INSULATION COLOURS

Unless otherwise stated in later clauses the insulation colours shall be in accordance with the following table.

Where other systems are installed the cable colours shall be in accordance with the details stated in the appropriate clause.

<u>SYSTEM</u>	<u>INSULATION COLOUR</u>	<u>CABLE END MARKER</u>
1) Main and Sub-Main		
a) Phase	Red	Red
b) Neutral	Black	Black
2) Sub-Circuits Single Phase		
a) Phase	Red	Red
b) Neutral	Black	Black

2.24 SUB-CIRCUIT WIRING

For all lighting and sockets wiring shall be carried out in the "looping in" system and there shall be no joints whatsoever. No lighting circuits shall comprise more than 20 points when protected by 10A MCB. Cables with different cross-section area of copper shall not be used in combination.

Lighting circuits P.V.C. cable.

- (i) 1.5mm² for all lighting circuits indicated on the drawing.

Power circuits P.V.C cable (minimum sizes).

- (ii) 2.5mm² for one, two or three 5Amp sockets wired in parallel.
- (iii) 2.5mm² for one 15Amp socket.
- (iv) 2.5mm² for maximum of ten switched 13 Amp sockets wired from 30 Amp MCB.

The wiring sizes for lighting circuits and sockets are shown on the drawings. In such cases, the sizes shown on the drawings shall prevail over the sizes specified.

Wiring sizes for other appliances shall be shown on the drawing or specified in later clauses of this specification.

2.25 SPACE FACTOR

The maximum number of cables that may be accommodated in a given size of conduit or trunking or duct is not to exceed the number in Tables B.5 and B.6 or as stated in Regulation B.91, B.117 and B.118 of the I.E.E Regulations whichever is appropriate.

2.26 INSULATION

The insulation resistance to earth and between poles of the whole wiring system, fittings and lumps, shall not be less than the requirements of the latest edition of the I.E.E Regulations. Complete tests shall be made on all circuits by the Sub-contractor before the installations are handed over.

A report of all tests shall be furnished by the Sub-Contractor to the Engineer. The Engineer will then check test with his own instruments if necessary.

2.27 LIGHTING SWITCHES

These shall be mounted flush with the walls, shall be contained in steel or alloy boxes and shall be of the gangs' ratings and type shown in the drawings. They shall be as manufactured by M.K. Electrical Ltd., or other equal and approved to KS 04 – 247: 1988

2.28 SOCKETS AND SWITCHED SOCKETS

These shall be flush pattern in steel/pvc box and shall be of the gangs and type specified in the drawings.

They shall be 13- Amp, 3-pin, shuttered, switched and as manufactured by "M.K. Electrical Co. Ltd.", or other approved equal to KS 04 – 246: 1987

2.29 FUSED SPUR BOXES

These shall be flush, D.P switched as in steel/pvc box and of type and make specified in the drawings complete with pilot light and as manufactured by "M. K. Electrical Company Ltd", or other approved equal. KS 04 – 247: 1988

2.30 COOKER OUTLETS

These shall be flush mounted with 13-A switched socket outlet and neon indicator Lamps.

The cooker control units shall be as manufactured by "M.K. Electrical Company Ltd", or other approved equal KS 04 – 247: 1988

2.31 CONNECTORS

Shall be specified in the drawings and appropriate rating. These shall be fitted at all conduit box lighting point outlets for jointing of looped P.V.C cables with flexible cables of specified quality.

2.32 LAMPHOLDERS

Shall be of extra heavy H.O skirted and shall be provided for every specified lighting fitting and shall be B.C., E.S., or G.E.S as required. All E.S. and G.E.S. holders shall be heavy brass type (except for plain pendants where the reinforced bakelite type shall be used). The screwed cap of the E.S and G.E.S. holders shall be connected to the neutral.

Where lampholders are supported by flexible cable, the holders shall have "cord grip" arrangements and in the case of metal shades earthing screws shall be provided on each of the holders.

The Sub-Contractor must order the appropriate type of holder when ordering lighting fittings, to ensure that the correct types of holders are provided irrespective of the type normally supplied by the manufacturers.

2.33 LAMPS

All lamps shall be suitable for normal stated supply voltage and the number and sizes of lamps detailed on the drawings shall be supplied and fixed. The Sub-Contractor must verify the actual supply voltage with the supply authority before ordering the lamps.

Tungsten filament lamps shall be manufactured in accordance with KS 04 – 112:1978 for general service lamps and KS 04 – 307:1985 for lamps other than general services. Tubular fluorescent lamps shall comply with KS 04 – 464:1982

Pearl lamps shall be used in all fittings unless otherwise specified.

2.34 LIGHTING FITTINGS AND STREET LIGHTING LANTERNS

This Sub-Contract shall include for the provision, handling charges, taking the delivery, safe storage, wiring (including internal wiring) assembling and erecting of all lighting fittings shown on the drawings.

All fittings and pendants shall be fixed to the conduit boxes with brass R/H screws. These to be in line with metal finish of fittings. The lighting fittings are detailed for the purpose of establishing a high standard of finish and under no circumstances will substitute fittings be permitted.

In case of rectangular shaped ceiling fittings, the extreme ends of the fittings shall be secured to suitable support in addition to the central conduit box fittings. Supports shall be provided and fixed by the Sub-Contractor.

The whole of the metal work of each lighting fittings shall be effectively bonded to earth. In the case of ball and/or knuckle joints short lengths of flexible cable shall be provided, bonded to the metal work on either side of the joints. If the above provisions are not made by the manufacturers -, the Sub-contractor shall include cost of additional work necessary in his tender. See "Flexible Cords" clause for details of internal wiring of lighting fittings.

Minimum size of internal wiring shall be 20/0.20mm (23/0067). Each lighting fitting shall be provided with number type and size of lamps as detailed on the drawings. It is to be noted that some fittings are suspended as shown on the drawings.

Where two or more points are shown adjacent to each other on the drawings, e.g. socket outlet and telephone outlet, they shall be lined up vertically or horizontally on the centre lines of the units concerned.

Normally, the units shall be lined up on vertical centre lines, but where it is necessary to mount units at low level they shall be lined up horizontally.

2.35 POSITIONS OF POINTS AND SWITCHES

Although the approximate positions of all points are shown on the drawings, enquiry shall be made as to the exact positions of all M.C.B panels, lighting points, socket outlet etc, before work is actually commenced. The Sub-contractor must approach the Architect with regard to the final layout of all lights on the ceiling and walls.

The Sub-contractor must consult with the Engineer in liaison with the Clerk of Works, or the General Foreman on site regarding the positions of all points before fixing any conduit etc. The Sub-Contractor shall be responsible for all alterations made necessary by the non-compliance with the clause.

2.36 STREET/SECURITY OUTDOOR LIGHTING COLUMNS:

The column shall be at a minimum of 225mm in the ground on 75mm thick concrete foundations and the pole up to 150mm shall be surrounded with concrete. The top bracket and plain section of the columns shall be common to and interchangeable with all brackets with maximum mismatching tolerance of 3mm between any pole and bracket. After manufacture and before erection the columns shall be treated with an approved mordant solution which shall be washed off and the whole allowed to dry. Thereafter, the columns shall be painted with one undercoat and two coats of gloss paint to an approved colour. All columns shall be complete with fused cut-outs.

2.37 TIMING CONTROL SWITCH

These shall be installed where shown on the drawings. Photocell timing control circuits which will operate 'on' with a specified level of darkness and 'off' with a given level of light. The initial adjustment will be done with approval of the Electrical Engineer.

2.38 WIRING SYSTEM FOR STREET LIGHTING

Cables shall be as indicated on the drawings, and shall be laid in a cable trench 450mm deep along the roadsides and 600mm deep across the roads and 900mm away from the road kerb or 1500mm away from the edges of the road. 'Loop-in' and 'Loop-out' arrangement shall be used at every pole. Wiring to the lanterns on each pole shall be with 1.5mm² PVC twin insulated and sheathed cable with earth wire shall be laid at least 600mm below the finished road level on a compact bed of murram at least 50mm thick and covered with a concrete surround 150mm thick.

2.39 METAL CONTROL PILLAR

These shall be metal clad and fabricated as per contract drawings and specification. The Sub-Contractor shall supply, install, test and commission control pillars including supplying, fixing connecting switchgears as detailed on the appropriate drawings.

2.40 CURRENT OPERATED EARTH LEAKAGE CIRCUIT BREAKER

Current operated earth leakage circuit breaker shall conform to B.S.S. 4293:68 rated at 240 volts D.P. 50 cycles A.C. Mains.

The breaker shall be provided with test switch and fitted in weatherproof enclosure for surface mounting. The rated load current and earth fault operating current shall be as specified in the drawings. These shall be as manufactured by Crabtree, Siemens or other equal and approved.

2.41 M.V. SWITCHBOARD AND SWITCHGEAR

The switchboard shall be manufactured in accordance with KS04-226 which co-ordinates the requirements for electrical power switchgear and associated apparatus. It is not intended that this K.S. should cover the requirements for specified apparatus for which separate Kenyan Standard exist. All equipment and material used in the switchboard shall be in accordance with the appropriate Kenya Standard.

The switchboard shall comprise the equipment shown on the drawings together with all current transformers, auxiliary fuses, labels, small wiring and interconnections necessary for the satisfactory operation of the switchboard.

The Switchboard shall be of the flush fronted, enclosed, metal clad type with full front or rear access as called for in the particular specifications, suitable for indoor use, sectionalized as necessary to facilitate transport and erection. The maximum height of the switchboard is to be approximately 2.0 metres. A suitable connection chamber containing all field terminals shall be provided at the top or bottom of the switchboard as appropriate.

Before manufacture, the Sub-Contractor shall submit to the consulting Engineer for approval of detailed drawings showing the layout, construction and connection of the switchboard.

All bus-bars and bus-bar connections shall consist of high conductivity copper and be provided in accordance with KS 04-226: 1985. The bus-bars shall be clearly marked with the appropriate phase and neutral colours which should be red, yellow, blue for the phases and black for neutral. The bus-bars shall be so arranged in the switchboard that the extensions to the left and right may be made in the future with ease should the need arise.

Small wiring, which will be neatly arranged and cleated, shall be executed in accordance with B.S. 158 and the insulation of the wiring shall be coloured according to the phase or neutral connection.

Switches and fuse switches, shall be in strict accordance with KS 04-183:1978 Class 2 switches. Means of locking the switch in the "OFF" position shall be provided.

All fuse switches shall comply with KS 04-183:1978, PARTS 2 and 3 a fault rating at least equal to the fault rating of the switchboard in which they are installed. Cartridge fuse links to KS 04-183:1978 category A.C. 46, class Q1 and fusing factor not exceeding 1.5 shall be supplied with each fused switch.

Mounting arrangements shall be such that individual complete fuse switches may be disconnected and withdrawn when necessary without extensive dismantling work.

When switches are arranged in their formation all necessary horizontal and vertical barriers shall be provided to ensure segregation from adjacent units. Means of locking the switch in the "OFF" position shall be provided.

2.42 STEEL CONDUITS AND STEEL TRUNKING

Conduits shall be of heavy gauge class "B" welded to Standard specification KS 04-180:1985. In no case will conduit smaller than 20mm diameter be used on the works. Conduits installed within buildings shall be black enamelled finish except where specified otherwise. Where installed externally or in damp conditions they shall be galvanised. Conduit fittings, accessories or equipment used in conjunction with galvanised conduits shall also be galvanised or otherwise as approved by the service engineer.

Metal trunking shall be fabricated from mild steel of not less than 18 swg. All sections of trunking shall be rigidly fixed together and attached to the framework or fabric or the building at intervals of not less than 1.2m. Joint trunking shall not overhang fixing points by more than 0.5m.

All trunking shall be made electrically continuous by means of 25 x 3mm copper links across each joint and where the trunking is galvanised, the links shall be made by galvanised flat iron strips.

All trunking fittings (i.e. Bends, tees, etc) shall leave the main through completely clear of obstructions and continuously open except through walls and floors at which points suitable fire resisting barriers shall be provided as may be necessary. The inner edge of bends and tees shall be chamfered where cables larger than 35mm² are employed.

Where trunking passes through ceilings and walls the cover shall be solidly fixed to 150mm either side of ceilings and floors and 50mm either side of walls.

Screws and bolts securing covers to trunking or sections of covers together shall be arranged so that damage to cables cannot occur either when fixing covers or when installing cables in the trough.

Where trunking is used to connect switchgear or fuseboards, such connections shall be made by trunking fittings manufactured for this purpose and not by multiple conduit couplings.

Where vertical sections of trunking are used which exceed 4.5m in length, staggered tie off points shall be provided at 4.5m intervals to support the weight of cables.

Unless otherwise stated, all trunking systems shall be painted as for conduit.

Where a wiring system incorporates galvanized conduit and trunking, the trunking shall be deemed to be galvanised unless specified otherwise.

The number of cables to be installed in trunking shall be such as to permit easy drawing in without damage to the cables, and shall in no circumstances be such that a space factor of 45% is exceeded.

Conduit and trunking shall be mechanically and electrically continuous. Conduit shall be tightly screwed between the various lengths so that they butt at the socketed joints. The internal edges of conduit and all fittings shall be smooth, free from burrs and other defects.

Oil and any other insulating substance shall be removed from the screw threads; where conduits terminate in fuse-gear, distribution boards, adaptable boxes, non-spouted switchboxes, etc., they shall, unless otherwise stated, be connected thereto by means of smooth bore male brass bushes, compression washers and sockets. All exposed threads and abrasions shall be painted using an oil paint for black enameled tubing and galvanizing paint for galvanised tubing immediately after the conduits are erected. All bends and sets shall be made cold without altering the section of the conduit.

The inner radius of the bend shall not be less than four (4) times the outside diameter of the conduit. Not more than two right angle bends will be permitted without the inter-position of a draw-in-box. Where straight runs of conduit are installed, draw-in-boxes shall be provided at distances not exceeding 15m. No tees, elbows, sleeves, either of inspection or solid type, will be permitted.

Conduit shall be swabbed out prior to drawing in cables, and they shall be laid so as to drain of all condensed moisture without injury to end connections.

Conduits and trunking shall be run at least 150mm clear of hot water and steam pipes, and at least 75mm clear of cold water and other services unless otherwise approved by the services engineer.

All boxes shall conform to KS 04 – 668: 1986, to be of malleable iron, and black enamelled or galvanized according to the type of conduit specified. All accessory boxes shall have threaded brass inserts.

Box lids where required shall be heavy gauge metal, secured by means of zinc plated or cadmium plated steel screws.

All adaptable boxes and lids of the same size shall be interchangeable.

Boxes used on surface work are to be tapped or drilled to line up with the conduit fixed in distance type saddles allowing clearance between the conduit and wall without the need for setting the conduit.

Where used in conjunction with mineral insulated copper sheathed cable, galvanized boxes shall be used and painted after erection.

Draw-in boxes in the floors are generally to be avoided but where they are essential they must be grouped in positions approved by the services engineer and covered and by the suitable floor traps, with non-ferrous trays and covers.

The floor trap covers are to be recessed and filled in with a material to match the floor surface.

The Sub-contractor must take full responsibility for the filling in of all covers, but the filling in material will be supplied and the filling carried out by the main building contractor.

Where buried in the ground outside the building the whole of the buried conduit is to be painted with two coats of approved bitumastic composition before covering up.

Where run on the surface, unpainted fittings and joints shall be painted with two coats of oil bound enamel applied to rust and grease free metalwork.

2.43 TESTING ON SITE

The Sub-contractor shall conduct during and at the completion of the installation and, if required, again at the expiration of the maintenance period, tests in accordance with the relevant section of the current edition of the Regulations for the electrical equipment of buildings issued by the I.E.E of Great Britain, the Government Electrical Specification and the Electric Supply Company's By-Laws.

- (a) Tests shall be carried out to prove that all single pole switches are installed in the 'live' conductor.
- (c) Tests shall be carried out to prove that all socket outlets and switched socket outlets are connected to the 'live' conductor in the terminal marked as such, and that each earth pin is effectively bonded to the earth continuity system. Tests shall be carried out to verify the continuity of all conductors of each 'ring' circuit.
- (d) Phase tests shall be carried out on completion of the installation to ensure that correct phase sequence is maintained throughout the installation. Triplicate copies of the results of the above tests shall be provided within 14 days of the witnessed tests and the Sub-contractor will be required to issue to the service engineer the requisite certificate upon completion as required by the regulations referred to above.
- (e) Any faults, defects or omissions or faulty workmanship, incorrectly positioned or installed parts of the installation made apparent by such inspections or tests shall be rectified by the Sub-contractor at his own expense.
- (f) The Sub-contractor shall provide accurate instruments and apparatus and all labour required to carry out the above tests. The instruments and apparatus shall be made available to the services engineer to enable him to carry out such tests as he may require.
- (g) The Sub-contractor shall generally attend on other contractors employed on the project and carry out such electrical tests as may be necessary.
- (h) The Sub-contractor shall test to the services engineer's approval and as specified elsewhere in this specification or in standards and regulations already referred to, all equipment, plant and apparatus forming part of the works and before connecting to any power or other supply and setting to work.

- (i) Where such equipment, etc., forms part of or is connected to a system whether primarily or of an electrical nature or otherwise (e.g. air conditioning system) the Sub-contractor shall attend on and assist in balancing, regulating testing and commissioning, or if primarily an electrical or other system forming part of works, shall balance, regulate, test and commission the system to the service engineer's approval.

APPENDIX TO GENERAL SPECIFICATIONS OF MATERIALS AND WORKS

The electrical sub-contractor shall comply with the following: -

1. Government Electrical Specifications No. 1 and No. 2.
2. All requirements of Kenya Power and Lighting Company Limited, and Communications Authority of Kenya (CAK).

SECTION B

PARTICULAR SPECIFICATIONS OF MATERIALS AND WORKS

PARTICULAR SPECIFICATIONS

1.00 SITE LOCATION

The site of the proposed works is at Bondeni, Eldoret Municipality, Uasin Gishu County.

2.00 SCOPE OF WORKS

The works to be carried out under this sub-contract comprise supply, installation, testing and commissioning of the following: -

a) Electrical Works

This shall include conduiting, cabling, fittings and accessories.

b) CCTV Installation

This shall include conduiting, fittings, cameras, termination and ensuring they are functional.

3.00 MATERIALS FOR THE WORKS

Materials shall be as specified in Section D and in the Bills of Quantities of this document which shall be read in conjunction with contract drawings. Alternative materials shall be accepted only after approval by the Project Manager.

4.00 BROCHURES FOR FIRE ALARM PANEL & ANY ELECTRICAL EQUIPMENT AND FITTINGS

For consideration and qualification tenderers shall, at their own cost, provide coloured manufacturer's brochures detailing technical literature and specifications where applicable.

5.00 MINIMUM SPECIFICATIONS FOR LED LIGHTING FITTINGS

- 1) Power Factor: ≥ 0.9
- 2) Operating freq. range: 45-55Hz
- 3) Operating Voltage Range: 130-300Vac
- 4) Operating hours: $\geq 50,000$ Hrs
- 5) Correlated Colour Temperature (CCT): ≥ 6000 K
- 6) Total Harmonic Distortion (THD): $< 15\%$

Bidders must provide technical brochures

5.00 ENERGY EFFICIENT SOLAR POWERED LED LIGHTING SPECIFICATIONS

The Contractor shall furnish and install the complete SOLAR LED lighting system as described in the Tender Specifications. The specific wattages of the LED luminaires, solarpanels, battery subsystems etc. are to be indicated in individual luminaire specifications.

SOLAR LED Streetlight Luminaire

1. Housing

The luminaire shall have a full die cast housing to provide adequate rigidity and strength and also ensure proper heat dissipation. The luminaire housing shall have separate Driver and LED lamp cavity to ensure cooler operation of LED lamps and good electrical separation.

The optical LED compartment shall have a thermally hardened glass cover and high- quality silicon gasket system. The glass cover shall be tightly secured with the housing. The complete luminaire shall be rated for IP 66 (Ingress Protection).

The housing shall feature highly reflective components and films to increase light output.

The weight of the luminaire shall not be more than stipulated below: -

- 1) Up to 9,500 lumens < 7 kg
- 2) Up to 15,000 lumens < 9 kg
- 3) Up to 28,000 lumens < 15 kg

2. Optics

The luminaire shall have flexible optical system to achieve lighting parameters, as stipulated by CUSTOMER NAME for various kinds of road from M1 to M6. The luminaire shall offer a composite system efficiency of at least 90 Lumen/Watt and a lumen package of up to 11,000 lumens. The luminaire shall use high efficiency LED and optics system to achieve max energy savings. Specially designed lens system with unique inner and outer profile for high efficiency LED to ensure maximum spacing between the poles and cover higher road widths. Multi-layer optics design to ensure adequate luminance and illuminance uniformity in the unlikely event of individual LED failure.

The luminaire should offer choice of narrow beam, medium beam and wide beam light distribution.

The optical lens system should ensure:

- 1) Long life with no discoloration (UV Protection)
- 2) White painted circuit board to have high reflectivity for maximum light output.

3 Future Compatibility

The luminaire shall be fully compatible with future LED upgrades when they become available. It shall have a modular design to upgrade / replace with new LED modules or LED drivers at site. All electronic components/drivers shall be mounted on a separate geartray with tool-less access and replacement. The luminaire shall have space available inside for communications antenna or equipment to be integrated into the luminaire for future tele-management control system implementation. Evidence showing tele-management capability shall be provided.

4 Surge Protection

The proposed luminaire shall have an in-built surge protection system to protect the electronic driver and the LED module with a minimum surge protection rating of 2KV.

5 Ingress Protection (IP) & Impact Resistance

The luminaire shall have Full IP 66 protection to ensure long reliable performance and to minimize maintenance requirement and an Impact resistance of IK 08. No chemical glue is to be used as that may cause breakdown of water-proof and dust-proof seal.

6 Maintenance

Tool-less maintenance of the LED modules and gears shall be provided for easy upgrade of LED modules on the pole

7 Mounting

The mounting of the luminaire will be in axial orientation through Ø 48-60mm side arm.

8 Thermal Management

Managing thermal properties in LED luminaires are most critical to ensure optimum performance of LEDs and reliability of the system. The housing shell under the circuit board should be specially designed to ensure perfect contact between the board and the luminaire housing for efficient heat dissipation. The housing over the Driver compartment cavity shall have adequate surface area to ensure fast heat dissipation.

9 Color Rendering Index and Color Temperature

The luminaire should have a minimum color rendering index (Ra) of 75+/- 5 and a color temperature of up to 5700K for maximum efficiency. The LED shall have a color consistency within 5 SDCM (standard deviation of color matching) as defined by McAdam. The color temperature variation of the LEDs should be restricted as per ANSI C78.377A with CCT variation limiting within 500K for nominal CCT of 4000K.

10 Useful Life Hours

The LED luminaire shall be designed for lumen maintenance of L70 or 70% at the end of useful life at ambient temperature of 35 deg C. The complete luminaire shall have a useful life of 50,000 burning hours. The luminaire including the driver will include a warranty of 3 years against manufacturing defects and complete Solar Lighting System 2 years.

11 Standards Conformity

The luminaire should fully conform to following Specifications: -

- 1) IEC 62471:2006, IEC/TR 62471-2:2009, EN 62471:2008, Photo biological safety of lamps and lamp systems IEC 62471 – Photo-biological safety of lamps and lamp systems.
- 2) IEC 60598-1:2008, EN 60598-1:2008 + A11:2009, General requirements and tests for Luminaires
- 3)
- 4) IEC 60598-2-3:2012, EN 60598-2-3:2003 + A1:2011, Luminaires, Part 2: Particular requirements: Section Three – Luminaires for road and street lighting
- 5) IEC 62493:2009, EN 62493:2010, Assessment of lighting equipment related to human exposure to electromagnetic fields
- 6) EN 55015: 2006/+A1:2007+A2:2009, Limits and methods of measurement of radio disturbance of electrical lighting and similar equipment.
- 7) EN 61547:2009, Equipment for general lighting purposes — EMC immunity requirements.
- 8) EN 61000-3-2:2006+A1:2009+A2:2009, Limits for harmonic currents emissions.
- 9) EN 61000-3-3:2008, Limitation of voltage fluctuations and flicker.

12 LED Driver Specifications

The solar LED luminaire's LED module and electrical components should be embedded in separated chamber. The solar LED luminaire input voltage / or system voltage should be 12V or 24V.

13 LED Chip Specifications

Solar LED luminaire should use 1st tier brand LED chips, and LED efficiency should be $\geq 125 \text{ lm/W}$ for NW/CW, $\geq 105 \text{ lm/W}$ for WW; the 1st tier LED manufacturers should be Cree, Lumileds, Osram or Nichia.

14 Ambient Temperature

The luminaire shall be suitable for ambient temperature range of between -40 to 45 degrees Celsius.

15 Controls

Dimming function and customization should be available for example programmable multistep dimming profile

16 Materials and Finishing

- Housing: Die-cast aluminum;
- Gasket: Heat resistant silicone rubber
- Glass: Tempered Glass with higher transmittance
- Frame: Gray Paint RAL7040 or different on request
- Tool-less maintenance of the LED modules and gears shall be provided for easy upgrade of LED modules on the pole.

17 Photo biological Safety

Light without blue and no photo biological risk; have been tested according to the IEC62471 (first edition, 2006-07) and been classified as Exempt group.

18 Wiring

The connector and cable should be attached with luminaire, ensuring IP67 protection. PV Panels (Photovoltaic Solar Panels)

1. Power Output (Pmax)

PV Panel sub-system should include panel and connectors. Solar Panel utilizes poly-crystalline and mono-crystalline silicon solar cells that combine high Wp (Watts Peak) output, affordability and efficiency. PV output peak wattage should be between 35Wp and 295Wp ± 3% (depends on configuration). PV Panel subsystem should have IP65 protection junction box for wiring.

2. Ambient temperature / operating temperature

PV panel shall be able to work / operate at -40 °C to +85 °C.

3. Encapsulation Material

Encapsulation Material Ethylene Vinyl Acetate (EVA)

4. Lamination

PV panel shall be laminate with tempered safety glass which provide safety and best possible transmittance.

5. Wiring

PV panel shall be equipped with plug-and-play connector allowing easy connection and maintenance.

6. Lifetime

The panel shall be with 25-year designed lifetime, with power decrease less than 20%.

7. Standards Conformity

Solar Panels shall meet the following standards:

- 1) EN 61730-1:2007, Photovoltaic (PV) module safety qualification-Part 1 Requirements for construction.
- 2) EN 61730-2:2007, Photovoltaic (PV) module safety qualification - Part 2 Requirements for testing.
- 3) EN 61215:2005, IEC 61215:2005, crystalline silicon terrestrial photovoltaic (PV) modules – Design qualification and type approval.

Charge Controller

1. The system should have protection against battery overcharge and deep discharge conditions.
2. Charge controller should be High-quality, 4-stage PWM-charging (4 Stage Battery Charging (Main, Float, Boost, Equalization),
3. Charge controller should provide:
 - Automatic System Voltage Recognition (12 V/24 V)
 - Reverse polarity protection
 - Short circuit protection: for panel and load terminals
 - Over discharging protection
 - Over voltage disconnection
 - Automatic electronic fuse protection
 - Over current protection: for load terminal
 - Reverse current protection: for panel terminal
 - Over temperature protection: reduce the charging current by WM until switch off the load

Battery Subsystem

Battery sub system should be Valve Regulated Lead Acid (VRLA) Battery integrates gel electrolyte technology with long service lifetime, high performance in deep discharging; it can be used in wide range of ambient temperature and keep good performance of constant power input. The battery shall be equipped in dedicated designed box with following features:

- Water-proof — Battery box housing IP68, against from water or humidity underground; 0.6m water-resistant by 1 week underwater; housing of plastic ensures good performance of stability with non-chapping at -20°C.
- Conform to requirements of lead-acid utilization — pipeline from box and lighting pole antrum, to keep balance of air pressure inside box. The pipe is made of low temperature resistant nylon, stable quality without distortion at -40°C.
- The battery shall provide following features and functions, Gelatin electrolyte, 12 years lifespan in float service without acidification at 77°F (25°C) owes to a good recycle capability
- all plug and play connection
- Working Temperature Range

Charge (-22 °C to 55 °C)

Discharge (-10 °C to 55 °C)

Storage (-22 °C to 55 °C) Standards

Conformity

Battery shall meet the following standards:

1. EN 61427:2005, IEC 61427:2005, Secondary cells and batteries for renewable energy storage – General requirements and methods of test

Battery box shall meet the following standards:

2. IEC 60598-1:2008, General requirements and tests for Luminaires, IPX8 rating.

QUALITY AND WARRANTEE:

- i) All the components and parts used in the solar street lighting systems should conform to the latest BIS or IEC specifications, wherever such specifications are available and applicable.
- ii) The street lighting system including the battery will be warranted for a period of five years from the date of supply.
- iii) The PV module(s) will be warranted for a minimum period of 5 years from the date of supply. The PV modules must be warranted for their output peak watt capacity, which should not be less than 90% at the end of five (10) years and 80% at the end of Ten (10) years.

- iv) The Warranty Card to be supplied with the system must contain the details of the system.

OPERATION AND MAINTENANCE MANUAL:

An Operation, Instruction and Maintenance Manual, in English and/or the National Language -Kiswahili, should be provided with the Solar Street Lighting System. The following minimum details must be provided in the Manual:

- Basic principles of Photovoltaic.
- A small write-up (with a block diagram) on Solar Street Lighting System - its components, PV module, battery, electronics and luminaire and expected performance.
- Type, Model number, Voltage & capacity of the battery, used in the system.
- The make and wattage of the CFL LED used in the lighting system.
- About Charging and Significance of indicators.
- Clear instructions about erection of pole and mounting of PV module (s) and lamp housing assembly on the pole or underground
- Clear instructions on regular maintenance and troubleshooting of the Solar Street Lighting System.
- Name and address of the contact person for repair and maintenance, in case of non-functionality of the solar street lighting system.

SOLAR LIGHTING LED DETAIL PARAMETERS

Item No.	Parameters	Values	Comments
1.	Input Voltage	12V	
2.	LED Efficiency (Lumens/watt)	140 Lumens/Watt	<p>Certificate from LED manufacturer needs to be provided with Datasheet of LED</p> <p>LED used must be of make CREE/Nichia/Osram/ Lumileds</p>

Item No.	Parameters	Values	Comments
3.	Life Expectancy	Above 60,000 Hours with 70 lumens	LED model should have LM80 certificate to prove the LED life is guaranteed for > 75,000. LED manufacturer should provide T21 –Life test report
4.	Color Temperature	5500-6500K	
5.	Working Humidity	10 to 90% RH6	
6.	Working Temperature	5 to 50 degree	
7.	Average Lighting Angle (Beam Angle)	120 Degree	
8.	Make of LED	PHILIPS/ CREE/LUMILEDS/ OSRAM/NICHIA	
9.	Total System Power Consumption (includes LED & drive part) in watts.	Total wattage =15W	
10.	Lamp Starting Time	Instantaneous, Less than 2 Seconds	
11.	System Efficacy (%)	Greater than 90%	
12.	Ingress Protection	IP65	NABL accredited certificate must be provided for IP65
13.	Light Output	Minimum 20 Lux when measured at the periphery of 4 meter diameter from a height of 4 meter. The illumination should be uniform without dark bands or abrupt variations, and soothing to the eye. Higher Light Output will be preferred	
14.	Power Factor	>0.95	
15.	Protection Function	Open and Short Circuits	

SECTION SIX
GENERAL AND PARTICULAR
PRELIMINARIES

BILL NO. 1

ITEM	DESCRIPTION	SHS	CTS
	<p align="center"><u>GENERAL AND PARTICULAR PRELIMINARIES</u></p> <p>A. <u>DEFINITION OF TERMS</u></p> <p>In this contract (as hereinafter defined) the following words and expresions shall have the meanings hereby assigned to them except where the context otherwise requires:-</p> <p><u>Employer:</u> means the National Housing Corporation, P.O. Box 30257, - 00100 GPO NAIROBI.</p> <p>(ii) <u>Partners:</u> means the</p> <p>1. NATIONAL HOUSING CORPORATION, P.O. BOX 30257 - 00100, NAIROBI.</p> <p>2. COUNTY GOVERNMENT OF HOMABAY, P.O. BOX 469 - 40300, NAIROBI.</p> <p>(iii) <u>Project Manager:</u> The term 'Project Manager' shall mean National Housing Corporation on whose expertise the subject matter is domiciled communicating on behalf of the Team Leader from National Housing Corporation, from National Housing Corporation, P.O. Box 30257-00100, NAIROBI.</p> <p><u>Quantity Surveyor:</u> The Term "Quantity Surveyor" shall mean Chief Quantity Surveyor, National Housing Corporation, P.O. Box 30257 - 00100, NAIROBI.</p> <p><u>Architect:</u> The term "Architect" shall mean Chief Architect, National Housing Corporation, P.O. Box 30257 - 00100, NAIROBI.</p> <p><u>Engineer:</u> The term "Engineer" shall mean Chief Engineer, National Housing Corporation, P.O. Box 30257 - 00100, NAIROBI.</p> <p><u>Contractor:</u> The term "Contractor" shall mean the person or persons,firm or Company whose tender has been accepted by the employer andincludes the Contractor's legal personal representatives, successors and permitted assigns.</p> <p><u>Approved or Approval:</u> Means approved or approval in writing by the Project Manager unless otherwise specified.</p> <p><u>CARRIED TO COLLECTION</u></p> <p align="right">KShs.</p> <p><u>GENERAL AND PARTICULAR PRELIMINARIES</u></p>		

ITEM	DESCRIPTION	SHS	CTS
	<p><u>Definition of terms (Cont'd)</u></p> <p><u>Architect's Instructions:</u> Means drawings, detail instructions, directions explanations, approval or orders issued in writing by the Project Manager or Project Manager's representative.</p> <p><u>Works:</u> The term 'the works' wherever used hereinafter and in all contract documents shall mean all or any portion of the works, materials and articles wherever the same are being manufactured or prepared which are to be used in the execution of this contract and whether the same be on site or not.</p> <p>It shall also be deemed to include of all sub-contractors and of all variations.</p> <p>) <u>"Ditto"</u> shall mean the whole of the preceding description except as qualified in the section in which it occurs. Where it in brackets, it shall mean the whole of the preceding description which which is contained within the appropriate brackets.</p> <p>i) <u>Direct or Directions:</u> Means directed or directions by the Project Manager or Project Team Member whose expertise the matter in question. is domiciled or relied upon.</p> <p>y) <u>Contract Drawings:</u> The term "the contract Drawings" wherever used hereinafter and in all contract documents shall be deemed to imply the drawings referred to in this document.</p> <p>) <u>Provisional:</u> Means that the quantity, description or value of work so described may be varied or executed in whole or in part or omitted entirely from the contract as directed and shall be measured and valued in accordance with the contract.</p> <p>i) <u>Site:</u> The term "the site" shall mean the lands and other places on, under, in or through which the works are to be executed or carried out and any other lands or places provided by the employer for the purpose of this contract.</p> <p>"CM" Shall mean Cubic Metre "SM" Shall mean Square Metre "LM" Shall mean Linear Metre "MM" Shall mean Millimetre "NO" Shall mean Number "KG" Shall mean Kilograms "MS" Shall mean measured separately</p> <p><u>CARRIED TO COLLECTION</u></p> <p><u>GENERAL AND PARTICULAR PRELIMINARIES</u></p>		
	KShs.		

ITEM	DESCRIPTION	SHS	CTS																				
A.	<p><u>SITE</u></p> <p>The site for the proposed works is situated 3km from the Homabay Central Business district within Homabay Municipality Area off Homabay - Kendu Bay - Kisumu Highway, Homabay County.</p>																						
B.	<p><u>VISIT THE SITE</u></p> <p>Before tendering, the Contractor should visit the site and satisfy himself as to local conditions, water, lighting services, the accessibility of the site, the full extent and character of operations, the nature of the ground, the supply of and conditions affecting labour services and materials necessary for the execution of the Contract works generally and shall make all necessary allowances and provisions for his tender as no claim for want of knowledge in this respect will be allowed. If unable to locate the site, he should apply to the Project Manager for directions to enable him to do so.</p>																						
C.	<p><u>SCOPE OF CONTRACT.</u></p> <p><u>1. Two, One and Studio flats and related Civil Works</u></p> <p>The works to be carried out in this contract comprise the construction of five blocks in a separate. The Five blocks comprise One Hundred, three, two and bedroom flats per block i.e. four flats per floor in 5No. storeys. Total plinth area of all the buildings is Approximately 6,450M² (For General Guidance Only).</p> <p><u>2. Civil Works</u></p> <p>These works consist of paved parkings and footpaths, street lighting, boundary wall construction, landscaping, water supply from and foul drainage to Homabay Water and Sewerage Company water and sewer lines respectively</p> <table> <tr> <th><u>HOUSE TYPE</u></th><th><u>NO. OF BLOCKS</u></th><th><u>TOTAL NO.</u></th><th><u>PLINTH AREA</u></th></tr> <tr> <th><u>OF UNITS</u></th><th></th><th></th><th><u>PER UNIT</u></th></tr> <tr> <td>Studio Unit</td><td>1</td><td>30</td><td>25.00 SM (Approx)</td></tr> <tr> <td>1Bedroom</td><td>2</td><td>40</td><td>41.00 SM (Approx)</td></tr> <tr> <td>2Bedroom</td><td>2</td><td>40</td><td>61.00 SM (Approx)</td></tr> </table>	<u>HOUSE TYPE</u>	<u>NO. OF BLOCKS</u>	<u>TOTAL NO.</u>	<u>PLINTH AREA</u>	<u>OF UNITS</u>			<u>PER UNIT</u>	Studio Unit	1	30	25.00 SM (Approx)	1Bedroom	2	40	41.00 SM (Approx)	2Bedroom	2	40	61.00 SM (Approx)		
<u>HOUSE TYPE</u>	<u>NO. OF BLOCKS</u>	<u>TOTAL NO.</u>	<u>PLINTH AREA</u>																				
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2Bedroom	2	40	61.00 SM (Approx)																				
D.	<p><u>EQUIPMENT</u></p> <p>The Contractor shall make available on site as and when required by the Project Manager a modern and accurate level together with levelling staff, Ranging rods and one 30 metre metallic measuring tape.</p>																						
	<p><u>CARRIED TO COLLECTION</u></p> <p style="text-align: right;">KShs.</p>																						
	<p><u>GENERAL AND PARTICULAR PRELIMINARIES</u></p>																						

ITEM	DESCRIPTION	SHS	CTS
A.	<u>INSERTION TO BE MADE IN APPENDIX TO THE CONDITIONS.CONTRACT</u>		
	Name of Project Manager	NATIONAL HOUSING CORPORATION	
	Amount of Surety	10% of Contract Sum	
	Amount of penalties to be withheld for late submission of work programme or an updated programme	KShs.5,000.00 per day	
	Minimum insurance covers		
	- Loss or damages to the works-----	(Contract Sum)	
	- Insurance to cover other property	KShs. 10,000,000.00	
	- Insurance to cover other personal injury and death (public liability)	KShs. 10,000,000.00	
	Insurance to cover Contractor's employees	As per Work Injuries and Benefits Act	
	Fluctuations Adjustments	Shall not apply in the contract	
	Period for submission of programme	One week from site possession	
	Period of an updated programme	One week	
	Date for possession of site acceptance	To be stated in the letter of	
	Start date acceptance	To be stated in the letter of	
	Contract Period.....	(52) Weeks.	
	
	EMPLOYER	CONTRACTOR	
	DATE:.....	DATE:.....	
	<u>CARRIED TO COLLECTION</u>	KShs.	
	<u>GENERAL AND PARTICULAR PRELIMINARIES</u>		

ITEM	DESCRIPTION	SHS	CTS
	Date for practical completion acceptance	To be stated in the letter of acceptance	
	Intervals for payments	Thirty (30) days	
	Minimum amount of value of work done and materials on site to justify a payment certificate	Not Applicable.	
	Percentage retained as Withholding VAT	2% of VAT payable	
	Percentage retained as Withholding Income TAX	3% of total amount Payable	
	Percentage of certified value retained	10%	
	Limit of retention fund	10%	
	Period for release of interest on retention money to Contractor.	Not applicable. No interest chargeable.	
	Period of final measurement completion	Six months from practical completion	
	Defects Liability period completion	Twelve months from practical completion	
	Damages for delay in completion day	At the rate of KShs. 30,000/= per day	
	
	EMPLOYER	CONTRACTOR	
	DATE:.....	DATE:.....	
	<u>CARRIED TO COLLECTION</u>	KShs.	
	<u>GENERAL AND PARTICULAR PRELIMINARIES</u>		

ITEM	DESCRIPTION	SHS	CTS
A.	<u>GENERAL MATTERS</u> The quantities measured in the Bills of Quantities are all provisional and subject to measurement once the works are executed.		
B.	<u>VALUE ADDED TAX (VAT)</u> The Contractor's attention is drawn to the Legal Notice in the Finance Act part 3 Section 21(b) operative from 1 st September, 1993 which requires Payment of VAT on all contracts. The Contractor should therefore include an allowance in his rates and prices for VAT and any other Government taxes and levies currently in force.		
C.	<u>WITHHOLDING INCOME TAX</u> The tender is advised that in accordance with Government regulations withholding Tax will be levied against the total contract sum by the Employer and remitted to the Commissioner of Income Tax; through all interim and final certificates. It should however be noted that this is not an additional Tax; but it is an advance payment of Income Tax which will be refundable once the Contractor has submitted his annual returns to the Commissioner of Income Tax; who will do the refunds when he is satisfied that all the income tax regulations have been complied with.		
D.	<u>SUFFICIENCY OF TENDER</u> The contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices stated in the priced Bills of Quantities which rates and prices shall cover all his obligations under the contract and all matters and things necessary for the proper execution, completion and maintenance of the works.		
B	<u>SAMPLE FLAT</u> The Contractor is required to commence erection and complete within sixteen weeks one Sample Flat in each site as directed by the Project Manager after commencement of the works. The Contractor shall keep the Sample Flat clean throughout the Contract period and upon completion. The Sample Flat shall not be used for storage of materials by both the Main Contractor and Sub-Contractors. Apenalty of Kshs.5,000.00 per day will be imposed for late completion of the sample flat.		
	<u>CARRIED TO COLLECTION</u>	KShs.	
	<u>GENERAL AND PARTICULAR PRELIMINARIES</u>		

ITEM	DESCRIPTION	SHS	CTS
A.	<p><u>INSURANCE</u></p> <p>The contractor shall insure as required by clause 30 of the conditions of contract in Tender document "A".</p> <p>No payment on account for the work executed will be made to the Contractor until he has satisfied the Project Manager either by production of an Insurance Policy or an insurance certificate that the provisions of the Insurance Clauses have been complied with in all respect and payment for premiums made as necessary.</p>		
B.	<p><u>BOND OR SECURITY DEPOSIT</u></p> <p>The Contractor will be required to furnish a Bond from licenced bank in tier 1 or tier 2 Bank in a sum equal to 10% of the Contract sum, using the standard form of Bond provided.</p> <p>Alternatively the Project Manager may at his discretion, accept a security deposit in cash in lieu of the Bond. The deposit is to be of the same amount as the Bond.</p> <p>No payment on account for the work executed will be made to the Contractor until he has submitted the performance Bond to the Engineer duly signed, sealed and stamped from an approved Bank.</p>		
C.	<p><u>SITE OFFICE AND CLERK OF WORKS ACCOMODATION</u></p> <p>The site office and Clerk of Works accomodation shall be constructed in accordance with NHC drawing No. 09a in appendix "A". The office shall be completed and ready for use within six (6) weeks from the date of site possession failure to which liquidated damages/penalty of KShs. 5,000/= per day will apply for non-completion</p> <p>The site office shall be equipped with sufficient furniture to permit the Project Manager to hold site meetings in it, and for the Clerk of Works or any other site staff to operate efficiently</p> <p>The Contractor shall pay for all charges for electricity and water bills during the construction and maintenance periods</p> <p>The contractor shall also allow for providing the services of a cleaner for keeping both the office and the closet in a clean and sanitary condition from commencement to completion of the works</p>		
	<u>CARRIED TO COLLECTION</u>	KShs.	
	<u>GENERAL AND PARTICULAR PRELIMINARIES</u>		

ITEM	DESCRIPTION	SHS	CTS
	<p><u>SITE OFFICE CONTD.....</u></p> <p>The site office shall be retained by the National Housing Corporation on completion of the contract</p> <p>A. <u>SIGNBOARD</u></p> <p>The Contractor shall provide, erect and maintain throughout the Contract period and afterwards clear away a signboard in accordance with drawing No. NHC. 110/49 in appendix "A"</p> <p>The height of the lowest board on the signboard not to be lower than 1.20m above the surrounding ground levels</p> <p>The Signboard will comprise of a strong well braced frame set in foundations with a "Title" board and separate boards for all consultants, Main and Sub-contractors.</p> <p>The whole of the supports and boards must be well painted and the lettering, which must not exceed 50mm high on the consultants boards, motifs etc. must be carried out by an experienced sign writer to the approval of the Project Manager.</p> <p>Advertising on the signboard will not be permitted except with the written authority from the Project Manager.</p> <p>The Contractor shall be responsible for paying any charges, fees or taxes demanded by the County of Nairobi in respect of the Signboard installation during the contract period.</p> <p>The signboard shall be erected within Two (2) weeks from the date of site possession. A penalty of KShs. 2,000.00 per day for non-availability of the signboard or delay in erecting the same shall be charged .</p>		
	<p><u>CARRIED TO COLLECTION</u></p> <p>KShs.</p>		
	<p><u>GENERAL AND PARTICULAR PRELIMINARIES</u></p>		

ITEM	DESCRIPTION	SHS	CTS
A.	<p><u>TELEPHONE</u></p> <p>The Contractor shall provide and maintain in the site office a mobile telephone set with adequate airtime for the entire duration of the contract. The telephone shall be available for use by the Project Manager and his representatives during working hours. The telephone set is to revert to the Employer on completion of the contract.</p>		
B.	<p><u>TRAINING LEVY</u></p> <p>The Contractor's attention is drawn to The Industrial Training (Amendment) Act, No. 34 of 2022 which requires payment by the Contractor of a Training Levy on all Contracts of more than KShs. 50,000.00 in value and his tender must include for all costs arising or resulting therefrom. Immediately after Contractor is given possession of site, the contractor shall be required to produce receipts as proof that he has complied with this legal notice.</p> <p>Reimbursement shall be upon fulfilment of this requirement. In the event of the Contractor defaulting by not remitting the monies to the Directorate of Industrial Training, Ministry of Labour and Human resources development, the client shall reserve the right to deduct an equivalent amount from monies to become due in payment certificates and remit the said amount to the relevant authority without reference to the Contractor.</p>		
C.	<p><u>STANDARD LEVY</u></p> <p>The Contractor's attention is drawn to the standards levy order (1990) which was amended on 26th November 1999 vide legal notice No. 183 of 1999. The Contractor is required to pay a monthly levy of 0.2% of his ex-factory price of construction works and must allow for this when tendering.</p>		
D.	<p><u>REGISTRATION OF WORKPLACE</u></p> <p>The Contractor's attention is drawn to Section 44 of the Occupational Safety and Health Act, 2007 requires that before any person occupies or uses any premises as a workplace in Kenya he shall apply for the registration of such premises by sending to the Director of Occupational Safety and Health Services a written notice containing the particulars set out in the Fourth Schedule of the Act. Section 45 (6) of the same Act requires that an occupier shall renew the certificate of registration annually. Applicants are also required to pay the OSH levy (Ksh. 3,000) and registration fee (Ksh. 2,000) to the DOSHS account.</p>		
E.	<p><u>FIXED PRICE CONTRACT</u></p> <p>This is a fixed price contract deemed to include all duties, tariffs and taxes imposed by the Government and Statutory/Local Authorities. Fluctuations for labour (Price Adjustments) is not applicable.</p>		
	<p><u>CARRIED TO COLLECTION</u></p> <p style="text-align: right;">KShs.</p>		
	<p><u>GENERAL AND PARTICULAR PRELIMINARIES</u></p>		

ITEM	DESCRIPTION	SHS	CTS
A.	<p><u>FIGURED DIMENSIONS</u></p> <p>Figured dimensions are to be followed in preference to dimensions scaled from the drawings but whenever possible dimensions are to be taken on the site. Before any work is commenced by Sub-contractor or specialist firms, dimensions must be checked on the site and/or buildings and agreed with Main Contractor, irrespective of the comparable dimensions shown on the drawings. The Contractor shall be responsible for the accuracy of such dimensions.</p>		
B.	<p><u>AREA TO BE OCCUPIED BY THE CONTRACTOR</u></p> <p>The area to be occupied by the Contractor for use as storage or erection of workshops etc shall be defined on the site by the Project Manager and the Contractor must confine his activities to the areas so marked and must ensure his own and Sub-contractor's workmen do not trespass on the adjoining property or cause inconvenience to its occupiers.</p>		
C.	<p><u>WORK TO BE OPENED UP AT THE REQUEST OF THE PROJECT MANAGER.</u></p> <p>The Contractor shall, at the request of the Project Manager within such time as the Project Manager shall name, open for inspection any work covered up, and should the Contractor refuse or neglect to comply with such request, the Project Manager may employ workmen other than those employed by the Contractor to open up the same. If the said work has been covered up in contravention of the Project Manager's instructions, or if, on being opened up, it be found not in accordance with the drawings or Bills of Quantities or the instructions of the Project Manager, the expenses of opening and covering it up again, whether done by the Contractor or by the Project Manager, shall be borne by and be recoverable from the Contractor or may be deducted from any monies due to the Contractor. If the work has not been covered up in contravention of such instructions and be found in accordance with the said drawings and Bills of Quantities, then the expenses aforesaid shall be borne by the Employer and be added to the Contract Sum, provided always that, in the case of foundations or of any other urgent work so opened up, and requiring immediate attention, the Project Manager shall within a reasonable time after the work has been opened, make or cause to be made the inspection thereof, and the expiration of such time, if such inspection shall not have been made the Contractor may cover up the same and shall not be required to open it up again for inspection except at the expense of the Employer.</p>		
	<p><u>CARRIED TO COLLECTION</u></p> <p style="text-align: right;">KShs.</p>		
	<p><u>GENERAL AND PARTICULAR PRELIMINARIES</u></p>		

ITEM	DESCRIPTION	SHS	CTS
A.	<p><u>WORKS PROGRAMME</u></p> <p>The Contractor shall, upon possession of site draw up a works programme, setting out the order in which the works are to be carried out with the appropriate date thereof. The works programme is to be agreed upon with the Project Manager within a maximum of one (1) week from the date of possession of site and one (1) week for an updated programme. No deviation from the order set out in the programme will be permitted without the written consent of the Project Manager. The Main Contractor will be responsible for arranging the above programme with all Sub-Contractors including nominated Sub-contractors and nominated Suppliers.</p> <p>Payment as stated in the appendix in the conditions of Contract will be held unless the progress schedule is approved and agreed upon within the stipulated time indicated above.</p>		
B.	<p><u>WATER AND ELECTRICITY SUPPLY FOR THE SITE AND THE WORKS</u></p> <p>The Contractor shall provide at his own cost and risk all necessary water, electric light and power required for use in the works. The Contractor must make his own arrangements for connections to the nearest suitable water and electricity main and for metering the same. He must also provide temporary storage tanks and meter as required at his own cost and clear away when no longer required and make good on completion to the entire satisfaction of the Engineer. The Contractor shall pay all charges in connection therewith. No guarantee is given that sufficient water will be available from the main and the Contractor, must make his own arrangements for augmenting this supply at his own cost if necessary.</p>		
C.	<p><u>ACCESS TO SITE AND TEMPORARY ROADS</u></p> <p>Means of access to the site shall be agreed with the Project Manager prior to the commencement of the works and the Contractor must allow for building any temporary access roads, culverts, bridges, roadside rainwater drains for the transport of materials, plant and workmen including the provision of any other means of gaining access to the site. Upon completion of the works the Contractor shall remove such temporary access roads, temporary culverts, etc and make good and reinstate all works and services disturbed to the satisfaction of the Project Manager and the Local Authority.</p>		
	<p><u>CARRIED TO COLLECTION</u></p> <p>KShs.</p>		
	<p><u>GENERAL AND PARTICULAR PRELIMINARIES</u></p>		

ITEM	DESCRIPTION	SHS	CTS
A.	<p><u>SANITATION OF THE WORKS FOR WORKERS</u></p> <p>The sanitation of the works shall be arranged and maintained by the Contractor to the satisfaction of the Local Authorities and the Project Manager.</p> <p>The latrines shall be enclosed with timber framing and corrugated iron sheet roof, sides and partitions. The site of the latrine shall be agreed with the Project Manager and the works shall not be commenced before the sanitary accommodation has been approved by the Project Manager and the Local authorities.</p> <p>The Contractor will be required to pay all conservancy charges and employ adequate sweepers on the site to ensure clean maintenance and daily disinfecting of the latrines upon completion of the works. The latrines and any temporary drain shall be removed and all works and surfaces disturbed made good and whole area disinfected and left clean and free from pollution all to the satisfaction of the Project Manager and Local authorities.</p>		
B.	<p><u>SETTING OUT</u></p> <p>The Contractor shall set out the works in accordance with the dimensions and levels shown on the drawings and shall be responsible for the correctness of all dimensions and levels so set out by him and will be required to amend all errors arising from inaccurate setting out or discrepancy in the dimensions or levels marked on the drawings, such errors or discrepancies must be reported by the Contractor to the Project Manager for his immediate attention.</p> <p>No work shall be commenced by the Contractor until he has received written instructions from the Project Manager to adjust such discrepancies which may have been proved. Upon receipt of such instructions the contractor shall thereupon be responsible for the accurate setting out of the work giving effect to the adjustments necessary to comply with such instructions, no claim for extra expense or relief may be made thereafter.</p>		
C.	<p><u>SECURITY OF WORKS</u></p> <p>The Contractor shall be entirely responsible for the security of the works, stores, materials, personnel, etc., both his own and Sub-contractors and shall provide all necessary watching, lighting and other precautions as necessary to ensure the security and the protection of the public.</p>		
	<p><u>CARRIED TO COLLECTION</u></p> <p>KShs.</p>		
	<p><u>GENERAL AND PARTICULAR PRELIMINARIES</u></p>		

ITEM	DESCRIPTION	SHS	CTS
A.	<p><u>MATERIALS AND WORKMANSHIP</u></p> <p>All materials and workmanship used in the execution of the works shall be of the quality and description herein described unless otherwise stated.</p> <p>Samples of all materials proposed to be permanently incorporated in the works must be submitted to the Project Manager for his approval before the bulk of the materials are delivered to the site.</p> <p>The contractor shall be responsible for ordering all materials as early as necessary to ensure that such materials are on the site as and when required for the works.</p>		
B.	<p><u>STORAGE OF MATERIALS</u></p> <p>The Contractor shall provide at his own cost where directed on the site weather proof lock-up sheds for the safe storage and custody of materials for the works including sub-contractor's materials and for the use of workmen engaged thereon and shall remove such sheds and make good damaged or disturbed surfaces upon completion to the satisfaction of the Project Manager.</p> <p>No material shall be stored or stocked on suspended slabs without the prior approval of the Project Manager.</p> <p>Materials stored off-the-site shall not be paid for unless the Project Manager has given a written approval for the storage away from the site.</p>		
C.	<p><u>LABOUR CAMPS</u></p> <p>The Contractor will not be permitted to house labour on the site and the Contractor must make all necessary arrangement for transportation of labour to and from the site.</p> <p>A watchman's camp will be permitted.</p>		
D.	<p><u>LABOUR</u></p> <p>Unless the Project Manager otherwise agrees, the Contractor is to recruit locally all his unskilled labour and as much as possible of his skilled labour.</p>		
	<p><u>CARRIED TO COLLECTION</u></p> <p>KShs.</p>		
	<p><u>GENERAL AND PARTICULAR PRELIMINARIES</u></p>		

ITEM	DESCRIPTION	SHS	CTS
A.	<p><u>TESTING</u></p> <p>The Contractor shall arrange at the request of the Project Manager for testing of materials and portions of work at his own expense. If the tests fail, the affected materials or work shall be removed and replaced at the Contractor's costs. The tests will be performed in an approved manner and by an approved testing authority.</p>		
B.	<p><u>NOTICES</u></p> <p>For notices to be served under the conditions of contract:-</p> <p>The Contractor shall notify the Project Manager an address where notice may be served upon him or in the event of his failing to do so.</p> <p>Notices shall be deemed served upon the Contractor if sent by Registered post to his usual place of business or left at his office on the site.</p>		
C.	<p><u>FAIR WAGES AND GOVERNMENT ACT ETC.</u></p> <p>The Contractor shall comply with the regulations of wages (Building and Construction Industry) order and shall be responsible for compliance by Sub-Contractor employed in the execution of the Contract. If required he shall notify the Project Manager of the names and address of all such Sub-Contractors.</p> <p>Should a claim be made to the Employer alleging the contractor's default in payment of fair wages to any workman employed on contract and if proof thereof satisfactory to the Project Manager is furnished by the Labour Department, the Project Manager may, failing payment by the Contractor, pay the claim out of any monies due or which may become due to the Contractor under this contract.</p> <p>The Contractor shall furnish the Project Manager if called upon to do so such particulars of the rates of wages, hours and conditions of labour referred to above as the Project Manager shall direct.</p> <p>The Contractor shall also be required to comply with all other Government Acts, regulations and orders in connection with employment of Labour.</p>		
	<p><u>CARRIED TO COLLECTION</u></p> <p>KShs.</p>		
	<p><u>GENERAL AND PARTICULAR PRELIMINARIES</u></p>		

ITEM	DESCRIPTION	SHS	CTS
A.	<p><u>WORKING HOURS</u></p> <p>The working hours shall be those generally worked by good employers in the Building and Civil Engineering Trade in Kenya. No work shall be carried at night or on gazetted holidays unless the Project Manager shall direct. No work shall be covered up or shall any correcting be carried out without prior approval of the Project Manager.</p>		
B.	<p><u>REMOVAL OF RUBBISH</u></p> <p>The Contractor is to remove all rubbish from the site from time to time and as instructed by the Project Manager and leave the site clean and tidy on completion. Heaped soils, materials etc. Shall on completion of works be spread and levelled properly to the satisfaction of the Project Manager.</p>		
C.	<p><u>PLANT, TOOLS AND VEHICLES</u></p> <p>Allow for providing all scaffolding, plant, tools and vehicles required for the proper execution of the works except for such items specifically and only required for the use of nominated sub-contractors as described herein. No timber used for scaffolding, formwork or temporary works of any kind shall be used afterwards in the permanent work.</p>		
D.	<p><u>METHODS OF MEASUREMENT</u></p> <p>The works contained in these Bills of Quantities are generally measured on the basis of the current Standard Methods of Measurement of Building Works, published by the Architectural Association of Kenya, Second Edition of June 2008.</p> <p>All work in this contract that is liable to adjustment has been measured as "provisional" in these Bills of Quantities, and no excavation, foundation work so described shall be filled in or covered up until all measurements needed for the adjustments of variations have been made by the Quantity Surveyor.</p> <p>The rates set down by the Contractor against each item in these Bills of Quantities shall, unless otherwise expressly provided to the contrary, or unless there is a separate item for extra labour, cutting or waste, shall be deemed to include for waste on materials, carriage and cartage, carrying in and return of empties, hoisting, setting, fitting and fixing in position making and all other labour and everything else necessary for the proper completion of each item of cutting shall include for consequent waste.</p>		
	<p><u>CARRIED TO COLLECTION</u></p> <p style="text-align: right;">KShs.</p>		
	<p><u>GENERAL AND PARTICULAR PRELIMINARIES</u></p>		

ITEM	DESCRIPTION	SHS	CTS
A.	<u>CONTRACTOR'S SUPERINTENDENCE/SITE AGENT.</u> 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 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 and instructions shall be deemed to have been given to the Contractor in accordance with the conditions of contract.		
B.	<u>PROVISIONAL SUMS</u> The term "Provisional Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A item A7(1) of the standard method of measurement. Such sums are net and no addition shall be made to them for profit.		
C.	<u>ADJUSTMENT OF PROVISIONAL SUMS.</u> 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 Managers orders, added to the Contract Sum, such works shall be valued as described for variations check clause 30 read "thirty" of the conditions of contract, but should any part of the work be executed by a Nominated Contractor, the value of such work shall be treated as a P.C. sum and profit and attendance items added.		
D.	<u>NOMINATED SUB-CONTRACTOR</u> When any work ordered by the Project Manager is to be executed by nominated sub-contractors, the Contractors shall enter into Sub-contracts as described in the conditions of contract in Tender document A and shall thereafter be responsible for such Sub-contractors in every respect. Unless otherwise described the Contractor is to provide for such Sub-Contractor any or all of the facilities described in these preliminaries. The Contractor will be required to obtain approval of the Project Manager in writing before employing any of his own (i.e. nominated) Sub-contractor for any portion of the works.		
	<u>CARRIED TO COLLECTION</u>	KShs.	
	<u>GENERAL AND PARTICULAR PRELIMINARIES</u>		

ITEM	DESCRIPTION	SHS	CTS
A.	<p><u>ATTENDANCE UPON OTHER TRADESMEN ETC</u></p> <p>The Contractor shall allow for the attendance of trade upon trade and shall afford any tradesmen or other persons employed for the execution of any work not included in this contract every facility for carrying out their work and also for the use of his ordinary scaffolding. The Contractor, however, shall not be required to erect any special scaffolding for them.</p> <p>The Contractor shall perform such carting away for and making good after the work by 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 of Quantities.</p>		
B.	<p><u>ALTERATIONS TO BILLS, PRICING E.T.C.</u></p> <p>Any unauthorised alterations or qualifications made to the text of the Bills of Quantities may cause the Tender to be disqualified and will in any case be ignored.</p> <p>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.</p> <p>All items of measured works shall be priced in details and Tenders containing lump sum to cover trades or groups of work must be broken down to show price of each item before they will be accepted. Lump sums to cover any items of Preliminaries shall be likewise broken down if so requires.</p>		
C.	<p><u>BLASTING OPERATIONS</u></p> <p>Blasting will only be allowed with the express permission of the Project Manager in writing. All blasting operations shall be carried out at the Contractor's sole cost and risk in accordance with any Government regulation in force for the time being, and any special regulation laid down by the Project Manager governing the use and storage of explosives.</p>		
	<p><u>CARRIED TO COLLECTION</u></p> <p style="text-align: right;">KShs.</p>		
	<p><u>GENERAL AND PARTICULAR PRELIMINARIES</u></p>		

ITEM	DESCRIPTION	SHS	CTS
A.	<p><u>HOISTING</u></p> <p>Throughout these Bills of Quantities generally no mention is made of heights for hoisting. All prices must include for hoisting and fixing at any level within the limits shown on the drawings or included in the general description of the works. Where a particular level is specified the Contractor shall price accordingly.</p>		
B.	<p><u>MATERIALS ARISING FROM EXCAVATIONS</u></p> <p>Materials of any kind obtained from the excavation shall be the property of the Employer. 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 the materials which the contractor would otherwise have had to supply with the written permission of the Project Manager Should such permission be given, the Contractor shall make due allowance for the value of the materials so used at a price to be agreed.</p>		
C.	<p><u>CLEANING UP</u></p> <p>On completion and as necessary during the course of the works the Contractor must thoroughly clean by washing all floors, woodwork, steps, glass and sanitary fittings, clean out all gulley and drain and leave the buildings and the entire site in a clean and habitable condition to the satisfaction of the Project Manager.</p>		
D.	<p><u>COUNTY BY-LAWS AND CHARGES</u></p> <p>The Contractor shall comply with all County by-laws and pay for all charges in connection therewith. The Contractor should therefore allow in his tender for such expenses.</p>		
E.	<p><u>EXISTING PROPERTY</u></p> <p>The Contractor shall take every precaution to avoid damage to the existing property including roads, cables, drains and other services and he will be held responsible for all damages arising from the execution of this contract to the aforementioned and he shall make good any damage when directed at his own expense to the satisfaction of the Project Manager and the Local Authority.</p>		
	<p><u>CARRIED TO COLLECTION</u></p> <p style="text-align: right;">KShs.</p>		
	<p><u>GENERAL AND PARTICULAR PRELIMINARIES</u></p>		

ITEM	DESCRIPTION	SHS	CTS
A.	<p><u>ANTI-CORRUPTION SIGNBOARD</u></p> <p>Allow a Provisional Sum of Kenya Shillings Fifty Thousand Only for a the Contractor to provide, erect and maintain throughout the contract period, an Anti-Corruption Signboard in accordance with Anti-corruption drawings and afterwards clear away the signboard on completion of the project</p> <p>The height of the lowest board on the sign board should not be lower than 1.20m above the surrounding ground levels</p> <p>The Signboard shall comprise a strong well braced mild steel frame set in foundations with a "Title" board and a separate board</p> <p>Advertising on the board will NOT be permitted</p>	50,000	
B.	<p><u>WHITE ANTS AND TERMITES</u></p> <p>Allow for destroying any white ants and termites' nests found in the vicinity of the buildings, destroying Queen Ants, depositing cyanide lumps in holes and tunnels and filling with hard-core and murram well rammed and scaled.</p>		
C.	<p><u>TEMPORARY DISPOSAL OF RAINWATER</u></p> <p>The Contractor shall provide and maintain all necessary temporary gutters, downpipes, chutes, earth or other drains, etc. for conveying rainwater from the building and site works. Embankment and sides of excavations shall be shaped to such slopes that soil erosion does not take place.</p> <p>The Contractor shall allow for temporary drainage, pumping and piping for keeping the buildings, services and entire site free from accumulation of and flooding with water and soil.</p> <p>The Contractor shall reinstate the existing ground to the satisfaction of the Project Manager on practical completion of the works.</p>		
D.	<p><u>PRIME COST (OR P.C.) SUMS</u></p> <p>The term "Prime Cost Sum" or "P.C. Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A item A7 (ii) of the standard Method of Measurement.</p> <p>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-Contractor. Persons of firms so nominated to supply goods or materials are described as Nominated suppliers.</p>		
	<u>CARRIED TO COLLECTION</u>	KShs.	
	<u>GENERAL AND PARTICULAR PRELIMINARIES</u>		

ITEM	DESCRIPTION	SHS	CTS
A.	<p><u>ADJUSTMENT OF P.C. SUMS</u></p> <p>In the Final account all P.C. sums shall be deducted and the amount properly expended upon the Project Manager order in respect or each of them added to the contract sum.</p> <p>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.</p> <p>Item of "Attendance" following P.C. sums shall be adjusted pro rata to the amount paid in the Final Account.</p> <p>Should the Contractor be permitted to tender and his tender be accepted for any work for which a P.C. sum is included in these Bills of Quantities, profit will be allowed at the same rate as it would be if works were executed by a Nominated Sub-contractor.</p>		
B.	<p><u>OBTAINING "OCCUPATION CERTIFICATES"</u></p> <p>The contractor shall obtain occupation certificates for all the units upon completion of the works from the relevant authorities and submit to the Employer.</p> <p>Release of first moiety upon completion of works will be subject to submission of the occupation certificates to the Employer.</p>		
C.	<p><u>INSPECTION BY STATUTORY BODIES/LOCAL AUTHORITIES</u></p> <p>The contractor shall allow for periodic inspections by local authorities/County building inspectors during the currency of the contract</p>		
	<u>CARRIED TO COLLECTION</u>	KShs.	
	<u>GENERAL AND PARTICULAR PRELIMINARIES</u>		

ITEM	DESCRIPTION	SHS	CTS
A.	<u>LASER DISTANCE MEASURER</u> Allow a provisional sum of Kenya Shillings Two Hundred Thousand Only for purchase of Leica DISTO S910 Pro Pack 984ft Range Laser Distance Measurer Pro Kit, Point to Point Measuring, Hard Case, TRI70 Tripod, FTA360S Adapter, Red/Black complete with charging capabilities, camera and usb charging and Bosch 32x Automatic Optical Level GOL 32 complete with tripod and rod The laser distance measurer shall revert to the Corporation on completion of the contract	200,000	
B.	<u>ELECTRONIC DISTANCE MEASURING WHEEL</u> Allow a provisional sum of Kenya Shillings thirty Thousand Only for purchase DigiRoller Plus III 12.5 Inch Estimators Electronic Distance Measuring Wheel with Large Backlit Digital Display; Measure in Feet, Inches, Meters, Yards; FREE Carrying Pack	30,000	
C.	<u>MEASURING EQUIPMENT MAINTENANCE</u> Allow for a sum of Twenty Thousand for repairs, general maintenance and servicing including battery replacement of the laser distance measurer and the electronic distance measuring wheel during the construction period	20,000	
	<u>CARRIED TO COLLECTION</u>	KShs.	
	<u>GENERAL AND PARTICULAR PRELIMINARIES</u>		

ITEM	DESCRIPTION	SHS	CTS
A.	<p><u>HOARDING</u></p> <p>The Contractor shall allow for providing and maintaining hoarding and access gates comprising of 30 gauge gci sheets, 2.50 meters high, from ground level nailed on sawn and cured timber posts as may be necessary for the protection of the works, area residents and the public all to the approval of the Project manager and the County Government of Homa Bay requirements. (Approximately 300 metres long)</p> <p>The Hoarding shall be erected at various locations on the site and later removed and disturbed surfaces made good to the satisfaction of the Project Manager on the completion of the contract works.</p> <p>The Hoarding and gates shall be painted as directed by the Project Manager and advertisements shall not be displayed except with prior written permission of the Project Manager.</p> <p>The Contractor shall be responsible for paying any charges, fees or taxes demanded by the Mombasa County Government in respect of the Hoarding installation during the contract period.</p>		
B.	<p><u>AS BUILT DRAWINGS</u></p> <p>The contractor shall allow for provision of 'as built' drawings for the project within the defects liability period</p>		
C.	<p><u>SHOP DRAWINGS</u></p> <p>The contractor shall allow for provision of 'shop' drawings to the approval of the project manager during the currency of the contract</p> <p>The drawings shall include details for the Materials used and other works to be incorporated</p>		
	<u>CARRIED TO COLLECTION</u>	KShs.	
	<u>GENERAL AND PARTICULAR PRELIMINARIES</u>		

ITEM	DESCRIPTION	SHS	CTS
A.	<u>ADDITIONAL ITEMS</u>		
	<u>NOTES:-</u> <p>Items in Bill No.1 of these Bills of Quantities should be examined carefully and will require to be executed wholly by the Contractor. If an item requires pricing or involves expenses to the Contractor, such item should be priced under additional items here or in the rates for Building works. No claim or reimbursement for expenses shall be made for want of knowledge or any deficiency in this respect.</p> <p>Should the Contractor not execute an item required by the Project Manager, the Employer shall execute the same item directly and the amount so incurred shall be deducted from any sum of money due or to become due to the Contractor. Should the Tenderer consider that these General and particular preliminaries do not include for all items together with descriptions, quantities, unit, rates and amounts. Such figures are to be totalled and included in the collection pages for these preliminaries and taken forward to the Main summary page. The Tenderer may insert additional pages should he so require. If no separate charge is made here under, the tender price shall be deemed to cover all expenses and obligations under the conditions of contract, specification and drawings.</p> <p>DESCRIPTION:</p> <p>1.</p> <p>.....</p> <p>2.....</p> <p>.....</p> <p>3.</p> <p>.....</p> <p>4.</p> <p>.....</p>		
	<u>CARRIED TO COLLECTION</u>	KShs.	
	<u>GENERAL AND PARTICULAR PRELIMINARIES</u>		

ITEM	DESCRIPTION	SHS	CTS
	<p align="center"><u>BILL NO. 01</u></p> <p align="center"><u>GENERAL AND PARTICULAR PRELIMINARIES</u></p> <p align="center"><u>COLLECTION</u></p> <p>Brought forward from 6/01</p> <p>Brought forward from 6/02</p> <p>Brought forward from 6/03</p> <p>Brought forward from 6/04</p> <p>Brought forward from 6/05</p> <p>Brought forward from 6/06</p> <p>Brought forward from 6/07</p> <p>Brought forward from 6/08</p> <p>Brought forward from 6/09</p> <p>Brought forward from 6/10</p> <p>Brought forward from 6/11</p> <p>Brought forward from 6/12</p> <p>Brought forward from 6/13</p> <p>Brought forward from 6/14</p> <p>Brought forward from 6/15</p> <p>Brought forward from 6/16</p> <p>Brought forward from 6/17</p> <p>Brought forward from 6/18</p> <p><u>CARRIED TO SUMMARY</u></p> <p><u>NHC HOMABAY AHP PHASE I SECTOR A - HOMABAY COUNTY</u> <u>GENERAL AND PARTICULAR PRELIMINARIES</u></p>		
	KShs.		

ITEM	DESCRIPTION	SHS	CTS
	<u>PRELIMINARIES COLLECTION CONTD.....</u>		
	Brought forward from 6/19		
	Brought forward from 6/20		
	Brought forward from 6/21		
	Brought forward from 6/22		
	Brought forward from 6/23		
	<u>CARRIED TO SUMMARY</u> KShs.		
	<u>GENERAL AND PARTICULAR PRELIMINARIES COLLECTION</u>		
	<u>SUMMARY</u>		
	Brought forward from 6/24		
	Brought down from above.....		
	<u>TOTAL AMOUNT FOR GENERAL AND PARTICULAR PRELIMINARIES</u>		
	<u>CARRIED TO GRAND SUMMARY</u> KShs.		
	<u>NHC HOMABAY AHP PHASE I SECTOR A - HOMABAY COUNTY</u>		
	<u>GENERAL AND PARTICULAR PRELIMINARIES</u>		

SECTION SEVEN BUILDER'S

WORK TWO- BEDROOM

UNITS2No. BLOCK

BILL NO. 2

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
<p style="text-align: center;"><u>BILL NO. 1</u></p> <p style="text-align: center;"><u>2 BEDROOM APARTMENT BLOCK</u></p> <p><u>ELEMENT NO. 1 SUB-STRUCTURES</u></p> <p><u>(ALL PROVISIONAL)</u></p> <p><u>Excavation</u></p> <p>Allow for upholding sides of excavations.</p> <p>AB Allow for keeping all excavations free from general water.</p> <p>C Excavate to reduce levels not exceeding 1.50m deep starting from existing ground level</p> <p>DEFG Ditto for foundations trenches not exceeding 1.50m deep from reduced levels</p> <p>H Ditto for column bases</p> <p>JKLM Ditto exceeding 1.50m deep but not exceeding 3.00m deep for foundations trenches .</p> <p>N Ditto for column bases</p> <p>Ditto exceeding 3.00m deep but not exceeding 4.50m deep for foundations trenches .</p> <p>Ditto for column bases</p> <p>Extra over for excavating in rock class 1.</p> <p>Ditto in rock class 3.</p> <p>Backfill selected excavated material around foundations.</p> <p>Cart away surplus excavated material to own spoil heaps.</p> <p><u>CARRIED TO COLLECTION</u></p> <p><u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u></p> <p><u>TWO BEDROOM UNITS; SUB-STRUCTURES</u></p>						
			ITEM			
			ITEM			
		124	CM			
		136	CM			
		62	CM			
		15	CM			
		15	CM			
		15	CM			
		20	CM			
		10	CM			
		15	CM			
		102	CM			
		250	CM			
				KShs.		

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
A	Imported quarry waste or other approved filling material well consolidated in 150mm thick layers as directed on site.	144	CM			
	<u>Blinding</u>					
B	Level and compact bottoms of excavations as directed on site.	132	SM			
CD	Concrete 1:4:8 blinding to strip footings	91	SM			
	Ditto to column bases	42	SM			
EFGH	<u>Guaranteed strength vibrated concrete mix 1:1½:3 in:-</u>					
J	Strip footings	25	CM			
	Column bases	14	CM			
	Columns	4	CM			
	100mm thick ground floor slab	242	SM			
KLM N	Extra over floor slab for thickening average 500mm wide x 500mm deep for staircase starter	1	LM			
	<u>Steel Reinforcement</u>					
	<u>Hot rolled, ribbed, high yield mild steel bars including soft iron tying wire and concrete spacer blocks in:-</u>					
	8mm diameter bars.	145	KG			
	10mm diameter ditto.	932	KG			
	12mm diameter ditto.	373	KG			
	16mm diameter ditto.	116	KG			
	<u>CARRIED TO COLLECTION</u>			KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>						
<u>TWO BEDROOM UNITS; SUB-STRUCTURES</u>						

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
A	20mm diameter ditto.	0	KG			
B	Steel wire fabric mesh reinforcement to B.S. 4483 Ref: A142 (2.20Kgs/m ²) in concrete bed (measured nett - No allowance made for minimum of 225mm laps) including tying and supporting as required	247	SM			
	<u>Walling.</u>					
C	225mm thick natural quarry stone walling bedded and jointed in cement sand (1:4) mortar reinforced with hoop iron at every alternate course.	316	SM			
	<u>Surface bed.</u>					
F	300mm thick hardcore surface bed hand packed and well rammed to floor.	215	SM			
G	50mm thick stone dust blinding well consolidated to surface of hardcore.	215	SM			
H	Form sinking in hardcore 500mm wide average x 500mm deep to receive thickened floor slab (measured separately)	1	LM			
J	Treat the top surface of hardcore and excavated plinths with 'Premise 200 SC' or 'Mchwatox 350 SC' or any other equal and approved insecticide to be applied by a specialized firm with a guarantee period of 10 years.	290	SM			
	<u>Damp-proofing</u>					
K	1000mm gauge polythene sheet damp proofing membrane laid with minimum 150mm side laps	247	SM			
L	200mm wide Hessian based bituminous felt damp proofing course laid and bedded on cement and sand (1:3) screed	108	LMLM			
M	100mm wide ditto.	37				
	<u>CARRIED TO COLLECTION</u>			KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>						
<u>TWO BEDROOM UNITS; SUB-STRUCTURES</u>						

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>Formwork</u>					
A	Sawn formwork to sides of strip footings 225 - 300mm girth	237	LM			
BCD	Ditto column bases	50	SM			
	Ditto columns	73	SM			
E	Ditto to edge of concrete slab 75 - 150mm girth	92	LM			
	<u>Expansion Joint</u>					
FG	25mm thick flexcel expansion joint	0	SM			
	<u>Plinths</u>					
	12mm Thick cement sand (1:4) rendering to plinths.	28	SM			
H	Apply two coats of black bituminous paint to rendered plinths.	28	SM			
	600 x 600 x 50mm thick precast concrete (class 25/20) paving slabs laid on and including 50mm thick bed of sand, 100mm thick layer of murram blinding, 500mm thick hardcore bed well compacted and consolidated in layers not exceeding 150mm thick complete with all necessary excavations, backfilling and carting away of surplus excavated material	55	SM			
	<u>CARRIED TO COLLECTION</u>			KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I,</u>						
<u>SECTOR A - HOMABAY COUNTY</u>						
<u>TWO BEDROOM UNITS; SUB-STRUCTURES</u>						

[illegible]

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>ELEMENT NO. 2 REINFORCED CONCRETE</u>					
	<u>STRUCTURE</u>					
	<u>Vibrated Reinforced Concrete class 25/20 as described in:-</u>					
ABCD	Columns Beams	26	CM			
EFG	175mm thick roof slab	61	CM			
	150mm thick suspended slab	238	SM			
	Ditto in staircase landings	951	SM			
HIJK	Ditto in staircase waist, treads and risers	16	SM			
	200mm thick parapet walls	6	CM			
LM NO	<u>Hot rolled, ribbed, high yield mild steel bars as before described</u>	97	SM			
P	8mm diameter bars					
	10mm ditto	8,381	KG			
	12mm ditto	8,846	KG			
	16mm ditto	6,620	KG			
	<u>Sawn formwork to:-</u>	720	KG			
	Horizontal soffits of suspended slabs					
	Sides and soffits of beams.	985	SM			
	Sides of columns	816	SM			
	Sloping soffits of staircase	434	SM			
	Ditto to landings of ditto	26	SM			
		16	SM			
	<u>CARRIED TO COLLECTION</u>					
				KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; REINFORCED CONCRETE STRUCTURE</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
ABCD	Edge of suspended slab 75 - 150 mm girth	370	LM			
E	Ditto but 150 - 225mm girth	92	LM			
	Ditto risers 150 - 225mm girth	119	LM			
	Sides of concrete parapet walls	193	SM			
	Ditto staircase strings 380mm wide (extreme) including cutting to form profile of treads and risers	28	LM			
	<u>CARRIED TO COLLECTION</u>			KShs.		
	<u>ELEMENT NO. 2 REINFORCED CONCRETE</u>					
	<u>STRUCTURE</u>					
	<u>COLLECTION</u>					
	Brought forward from page 7/06					
	Brought down from page above					
	<u>TOTAL AMOUNT OF ELEMENT NO. 2</u>					
	<u>CARRIED TO SUMMARY</u>			KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I,</u>					
	<u>SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; REINFORCED CONCRETE STRUCTURE</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
ABC	<u>ELEMENT NO. 3WALLING</u>					
	<u>EXTERNAL WALLS</u>					
	<u>Machine-cut natural quarry stone walling bedded and jointed in cement sand (1:4) mortar with and including hoop iron reinforcement at every alternate course in:-</u>					
	200mm thick walls					
DE	<u>Extra over</u> Raking cutting to top of 200mm thick walls.	925	SM			
	Labour and materials in eaves filling 200 x 250mm high	20	LM			
	<u>INTERNAL WALLING</u>	101	LM			
	<u>Machine-cut natural quarry stone walling bedded and jointed in cement sand (1:4) mortar with and including hoop iron reinforcement at every alternate course in:-</u>					
	200mm thick walls					
	100mm thick walls	715	SM			
		480	SM			
	<u>TOTAL AMOUNT FOR ELEMENT NO. 3 CARRIED TO SUMMARY</u>					
				KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>						
<u>TWO BEDROOM UNITS; WALLING</u>						

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>ELEMENT NO. 4ROOFING</u>					
	<u>All structural timber shall be sawn celcure treated second grade cypress timber members in:-</u>					
	200 x 20mm thick wrot cypress fascia board					
AB	Ditto barge board	84	LMLM			
	<u>FLAT ROOF COVERING</u>	18				
	<u>Cement and sand screed on concrete as described in:-</u>					
C	55mm (average) thick cement and sand vermiculite (1:6) lightweight screed finished to falls and cross falls		SM			
D	20mm thick layer of bituminous asphalt laid to engineers specifications to receive precast concrete interlocking tiles (measured separately)	238	SM			
E	200mm high flashing including setting edge in mortice in masonry walling with waterproofed cement and sand (1:2) mortar	238	LM			
F	20mm thick precast concrete interlocking tiles laid and jointed with waterproofing bituminous compound	150	SM			
	<u>Sundries</u>	238				
GH	Dishing bituminous asphalt finish around fulbora outlets		NO			
	Chase mortice in concrete parapet walling to receive bituminous asphalt flashing and make good	12	LM			
	<u>RAINWATER GOODS</u>	150				
I	<u>24 guage pre-painted galvanized steel in:-</u>					
	150mm diameter plastic fulbora outlet cast in concrete (mesure separately)		NO			
		12				
	<u>CARRIED TO COLLECTION</u>					
				KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; ROOFING</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
A	150 x 125mm box gutter with and including joints in running length fixed onto fascia board with approved holderbats at say 1200mm centres	84	LM			
BCD	Extra over gutter for forming 100mm diameter outlet.	2	NO			
E	Ditto but for stopped ends.	4	NO			
	Ditto corners to 150 x 125mm gutters	10	NO			
F	Ditto but box outlet size 300 x 300 x 300mm high with 100 x 100mm outlet	10	NO			
GHJ	100mm diameter down pipe fixed to walls with approved holderbats at say 1200mm centres	160	LM			
	Extra over down pipe for swanneck 600mm wide.	10	NO			
	Ditto but shoe.	10	NO			
K	Ditto but for rainwater funnel.	2	NO			
	<u>Painting and Decoration</u>					
	<u>Knot, prime, stop. Prepare and apply one undercoat and two finishing coats first quality gloss paint to:-</u>					
	Timber surfaces 200-300mm girth externally	102	LM			
	<u>CARRIED TO COLLECTION</u>			KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>						
<u>TWO BEDROOM UNITS; ROOFING</u>						

[illegible]

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>ELEMENT NO. 5DOORS</u>					
	<u>Take delivery and fix only the following mild steel casement doors in:-</u>					
A	Standard glazed steel casement double door overall size 2600 x 2550mm high in 2 No. equal openable leaves size 1300 x 2550 mm high complete with frame, hinges, approved "UNION" or "YALE" steel door lock; finished with red oxide primer and fixed to wall opening					
B	Ditto but single size 900 x 2400mm high comprising an openable leaf size 900 x 2100mm high and a fanlight size 900 x 300mm high	1	NO			
	<u>Supply and fix wrot celcured treated prime grade cypress in:-</u>	40	NO			
	<u>Flush Doors</u>					
CD	45mm thick semi-solid core flush door size 825 x 2050mm high					
	Ditto size 725 x 2050mm high	80	NO			
	<u>Door Frames</u>	40	NO			
	<u>Wrot Celcured cypress</u>					
EFGH	100 x 50mm thick rebated door frames fixed to walls.					
	100 x 50mm thick transome ditto.	720	LM			
J	40 x 15mm thick architrave.	120	LM			
	20mm diameter quadrant.	720	LM			
	<u>Supply and fix the following ironmongery complete with matching screws and furniture.</u>	720	LM			
	Pairs of 100mm wide pressed steel butt hinges.	180	PRS			
	<u>CARRIED TO COLLECTION</u>					
				KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; DOORS</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
AB	2 - Lever 'UNION' mortice lock complete with aluminium handles as made in England.	80	NO			
	100mm aluminium barrel bolt.	40	NO			
C	<u>Glazing</u>					
D	5mm thick clear sheet glass in panes exceeding 0.10m ² but not exceeding 0.50m ² fixed to steel casement doors with putty	86	SM			
	Dito fixed in fanlights with timber beading	38	SM			
E	<u>Sundry item</u>					
	40 x 3mm thick fish tailed mild steel holdfast 250mm long primed with red oxide; fixed to back of door frame and built into walling.	960	NO			
	<u>CARRIED TO COLLECTION</u>			KShs.		
	<u>ELEMENT NO. 5DOORS</u>					
	<u>COLLECTION</u>					
	Brought forward from page 7/12					
	Brought down from above					
	<u>TOTAL FOR ELEMENT NO. 5</u>					
	<u>CARRIED TO SUMMARY</u>			KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I,</u>					
	<u>SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; DOORS</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>ELEMENT NO. 6WINDOWS</u>					
	<u>PURPOSE-MADE CASEMENT WINDOWS</u>					
	<u>Take delivery and fix only the following purpose-made steel casement windows to recieve burglar proofing grilles (measured seperately) primed with red oxide primer before delivery to site with and including building in lugs to jambs, plugging and screwing to head and cill and bedding frame in water proof cement mortar, and pointing in approved mastic</u>					
A	Window size 2000 x 1350mm high overall, comprising of top hung, side hung and fixed lights subdivided into appropriate panes as per the Architects schedule and approval					
	Ditto size 1500 x 1350mm high overall	20	NO.			
BC	Ditto size 600 x 600mm high overall	40	NO.			
	<u>Supply and fix the following in brass as 'Kens Metal' or equal and approved:-</u>	40	NO.			
DE	Window stays					
	Fasteners.					
F	<u>Glazing</u>					
G	5mm thick clear sheet glass in panes exceeding 0.10m ² but not exceeding 0.50m ² fixed to steel casement windows (measured separately) with putty					
	Ditto but obscure glass ditto.	132	SM			
		22	SM			
	<u>CARRIED TO COLLECTION</u>					
				KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; WINDOWS</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>Window Cills</u>					
A	150 x 50mm thick cast insitu window cill weathered and throated complete with all necessary formwork and reinforcement to approval	154	LMLM			
B	Splayed cutting to walls.	154				
	<u>Take delivery and fix only the following purpose-made mild steel burglar proofing grilles</u>					
C	50 x 25 x 4mm thick heavy guage mild steel rectangular hollow section tubes in framework and bars in burglar proofing grilles. Fabrication finished with red oxide primer with and including building into walls and making good	154	SM			
	<u>CARRIED TO COLLECTION</u>			KShs.		
	<u>ELEMENT NO. 6WINDOWS</u>					
	<u>COLLECTION</u>					
	Brought forward from page 7/14					
	Brought down from above					
	<u>TOTAL FOR ELEMENT NO. 6</u>					
	<u>CARRIED TO SUMMARY</u>			KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I,</u>					
	<u>SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; WINDOWS</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>ELEMENT NO. 7FINISHES</u>					
	<u>External wall finishes</u>					
	<u>Keying</u>					
	Extra over walling for pointing with neat flush vertical and recessed horizontal joints in cement and sand (1:3) mortar as the work proceeds					
A	12mm thick cement sand (1:4) rendering to vertical wall surfaces.	925	SM			
BC	Ditto to concrete surfaces.	465	SM			
	<u>Textured Finishes</u>	277	SM			
D	12mm thick textured finish as Ruff and Tuff to walls					
	<u>Internal Wall Finishes</u>	261	SM			
	<u>Gauged cement, sand and lime (1:2:9) plaster as described in:-</u>					
EF	12mm thick backing finished rough with a wood float to receive wall tiles (measured seperately)					
	12mm thick steel float finish to vertical wall surfaces	595	SM			
	<u>Wall Tiles</u>	3,218	SM			
G	330 x 250 x 6mm thick coloured glazed ceramic wall tiles as manufactured by 'SAJ Ceramics' or any other equal and approved manufacturer fixed to walls with an approved adhesive with and including grouting in matching colour	595	SM			
	<u>CARRIED TO COLLECTION</u>					
				KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; FINISHES</u>					

ITEM	DESCRIPTION	QTY	UNIT			CTS
	<u>External Floor Finishes</u>					
A	32mm thick cement sand (1:4) screed wood float finished but with water proof cement finished to slope in wet areas to receive ceramic floor tiles (measured separately)	70	SM			
	<u>330 x 330 x 8mm thick non-slip coloured ceramic floor tiles as manufactured by 'SAJ Ceramics Ltd.' or any other equal and approved manufacturer laid on screed backing (measured seperately) with an approved adhesive with and including grouting in matching colour to:-</u>					
BC	Floors	70	SM			
	100mm high skirting with rounded top	138	LM			
	<u>Internal Floor Finishes</u>					
D	32mm thick cement and sand (1:3) screed finished rough with a wood float to receive ceramic floor tiles (measured seperately)	706	SM			
E	20mm thick ditto on staircase landing wood float finished to receive unpolished granolithic paving (measured separately)	16	SM			
FGH	300 mm wide treads	102	LM			
I	150 mm high risers	119	LM			
	Ditto 380mm high (maximum) to stairs	22	LM			
	32mm thick ditto but with water proof cement finished to slope in wet areas to receive ceramic floor tiles (measured separately)	74	SM			
	<u>CARRIED TO COLLECTION</u>					
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; FINISHES</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>330 x 330 x 8mm thick non-slip coloured ceramic floor tiles as manufactured by 'SAJ Ceramics Ltd.' or any other equal and approved manufacturer laid on screed backing (measured seperately) with an approved adhesive with and including grouting in matching colour to:-</u>					
AB	Floors	780	SM			
	100mm high skirting with rounded top	1,552	LM			
CDEF	<u>Unpolished granolithic paving</u>					
G	40mm thick paving laid on staircase landings	16	SM			
	Ditto on 300mm wide treads	102	LM			
H	Ditto but 10mm thick on 150mm high risers	119	LM			
	Ditto 250mm high (maximum) to stairs	22	LM			
	100mm high skirting with rounded top	65	LM			
JK	<u>External Ceiling Finishes</u>					
	12mm thick cement sand plaster as before described to soffites of suspended slabs.	70	SM			
	<u>Internal Ceiling Finishes</u>					
	12mm thick cement sand plaster as before described to soffites of suspended slabs.	850	SM			
	Ditto to slopping soffites.	26	SM			
	<u>CARRIED TO COLLECTION</u>			KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>						
<u>TWO BEDROOM UNITS; FINISHES</u>						

[illegible]

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>ELEMENT NO. 8 PAINTING AND DECORATION</u>					
	<u>Prepare surfaces and apply one undercoat and two finishing coats of first quality emulsion paint on:-</u>					
A	Plastered walls internally.	3,218	SM			
	<u>Prepare surfaces and apply one undercoat alkaline primer and three finishing coats of silicone external paint on:-</u>					
D	Rendered vertical surfaces externally	742	SM			
	<u>Prepare surfaces and apply one undercoat and two finishing coats of first quality gloss paint on:-</u>					
EFGHJ	Glazed steel doors externally.	86	SM			
KLN	Ditto internally.	86	SM			
P	Glazed steel casement window ditto.	154	SM			
	Ditto externally.	154	SM			
	Burglar proofing	308	SM			
	General wood surfaces internally.	454	SM			
	Ditto 0 - 100mm girth	1,440	LM			
	Ditto 200 - 300mm girth internally	840	LM			
	Prime back of timber frames 0 - 100mm girth before fixing.	720	LM			
	<u>TOTAL FOR ELEMENT NO. 8 CARRIED TO SUMMARY</u>			KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; PAINTING AND DECORATION</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>ELEMENT NO. 9 BALUSTRADING-ALL</u>					
	<u>PROVISIONAL</u>					
	<u>The following in 3mm thick rolled hollow sections in staircase and balcony complete with end caps and wreathed bends with one coat red oxide primer including holes in concrete for balusters and making good as described in:-</u>					
AB	50 x 25mm top rail welded to balusters (measured separately)	132	LMLM			
	Ditto bottom rail	132				
C	50 x 50mm balusters 900 mm high welded to hand rail (measured separately) and bottom rail (measured separately) and one end grouted and built into concrete surfaces		NO			
D		220	NO			
E	25 X 25mm infill, 750 mm high with one end welded to bottom rail and other end to top rail	440	LM			
	100 X 50mm thick wrot cypress moulded hand rail screwed to 25 x 25mm top rail (measured separately)	132				
F G H J	<u>Extra over RHS tubes for:-</u>		NO			
KL	50mm Bend	40	NO			
	50mm Endcaps	96	NO			
M	Splay cutting to 50 x 50 x 3mm tubes	240	NO			
	Formed bend to 50 x 50 x 3mm tubes	64	NO			
	Cranked bend to 50 x 50 x 3mm tubes	96	NO			
	Welded joints between RHS members	960				
	<u>SUNDRIES</u>		NO			
	Make hole in concrete or walling 125mm deep and build in end of 50 x 25 x 3mm balusters with cement grout	220				
	<u>CARRIED TO COLLECTION</u>			KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; PAINTING AND DECORATION</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
AB	<u>Touch up primer, prepare and apply two undercoats and one finishing coat gloss paint to:-</u>					
	Metal surfaces of balustrading not exceeding 100mm girth	330	LMLM			
C	Ditto 100-200 mm girth	462				
	<u>Knot, prime, stop. Prepare and apply two undercoats and one finishing coat gloss paint on</u>					
	<u>woodwork internally to:-</u>		LM			
	Surfaces 100-200mm girth	132				
	<u>CARRIED TO COLLECTION</u>			KShs.		
	<u>ELEMENT NO. 9 BALUSTRADING</u>					
	<u>COLLECTION</u>					
	Brought forward from page 7/21					
	Brought down from above					
	<u>TOTAL AMOUNT FOR ELEMENT NO. 9</u>					
	<u>CARRIED TO SUMMARY</u>					
				KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I,</u>					
	<u>SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; BALUSTRADING</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<p align="center"><u>ELEMENT NO. 10</u></p> <p align="center"><u>JOINERY AND FIXTURES(ALL PROVISIONAL)</u></p> <p><u>NOTE: All blockboard, MDF boards, etc in joinery works shall be lipped with hardwood beading all round before fixing.</u></p> <p><u>High level cupboards</u></p> <p><u>The following in 20 No high level storage cupboard units 3200mm long x 600mm high x 300mm deep</u></p> <p><u>Prime grade cypress</u></p>					
ABC	38 x 25mm thick bearer plugged.	260	LM			
	Ditto pinned.	40	LM			
DEFG	20 x 20mm lipping pinned.	254	LM			
H	<u>25mm Thick blockboard</u>					
	Sides	6	SM			
J	Shelving	20	SM			
	Bottom	20	SM			
	Top	20	SM			
	Partition	14	SM			
	<u>Prepare and apply one coat aluminium primer to:</u>					
	Back of wood 0 - 100mm girth.	260	LM			
	<u>CARRIED TO COLLECTION</u>			KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; JOINERY AND FIXTURES</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>Knot, prime, stop. Prepare, apply two undercoats and one finishing coat of first quality hard gloss oil paint on woodwork:-</u>					
A	General surfaces	180	SM			
	<u>Prepare, knot, prime and apply two undercoats and one finishing coat clear wax varnish on woodwork to:-</u>					
B	Surfaces 0-100mm girth	254	LM			
	<u>Low level kitchen cupboards</u>					
	<u>The following in 20 No. low level kitchen cupboards below concrete worktop total girth grouped together 3600mm long x 850mm high x 550mm deep</u>					
CD	100mm thick concrete (mix 1:3:6) plinth	54	SM			
E	Sawn formwork to edge of concrete plinth 75-150mm girth	86	LM			
F	50 x 20mm thick fillet in forming rebate in concrete for door frame	86	LM			
	20mm thick cement and sand (1:3) screed trowelled smooth	54	SM			
G	<u>Worktop</u>					
HI	75mm thick concrete class 20 (1:2:4) in worktop reinforced with BRC mesh No. A142 holed for 1400mm long x 500mm wide kitchen sink (measured seperately)	54	SM			
	Sawn formwork to soffits of worktop	54	SM			
J	Ditto to edges of worktop 75 - 150 mm girth	86	LM			
	<u>Selected grade celcure treated wrot cypress in:-</u>					
	50 x 50mm rebated door frame	214	LM			
	<u>CARRIED TO COLLECTION</u>			KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>						
<u>TWO BEDROOM UNITS; JOINERY AND FIXTURES</u>						

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
ABCD	50 x 40mm frame	74	LM			
E	50 x 50mm twice rebated door frame	54	LM			
	32 x 20mm bearer pinned	60	LM			
	Ditto but plugged	114	LM			
FGHJ	Prime back of door frames before fixing a.b.d.	328	LM			
	<u>20mm thick blockboard hardwood lipped to all edges in:-</u>					
KL	Shelves	26	SM			
	Sides	14	SM			
M N P	Divisions	34	SM			
Q	Labour in rebating meeting stiles	74	LM			
	<u>Painting</u>					
	Apply one under coat and two coats of gloss paint as specified on general wood surfaces internally	286	SM			
	Ditto to surfaces 100 - 200mm girth.	342	LM			
	<u>The following in wardrobes (20 No.) size 1800mm wide x 2500mm high x 600mm deep in bedrooms</u>					
	100mm plain concrete (class Q) plinth.	20	SM			
	Sawn formwork to edge of plinths 75 - 150mm girth	34	LM			
	Fillet planted on formwork to form 30 x 70mm rebate.	34	LM			
	20mm cement and sand (1:3) screed as before.	20	SM			
	<u>CARRIED TO COLLECTION</u>			KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; JOINERY AND FIXTURES</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>Wrot Cypress</u>					
AB	75 x 50mm rebated door frame	146	LMLM			
CDE	75 x 50mm transome ditto	34	LM			
	75 x 50mm mullion	54	LM			
F	50 x 25mm bearer	180	LM			
	20mm diameter quadrant	146				
GH	<u>Blockboard</u>					
			SM			
J	25mm thick ordinary blockboard lipped all round in shelves etc.	34				
			NO			
	25mm Diameter chromium plated hanging rail, 1800mm long including end fixing brackets.	20	NO			
	Ditto shoe rack 900mm long including fixing brackets.	60				
KLM	Prepare and apply one coat of aluminium wood primer before fixing on backs of wood surfaces not exceeding 100mm girth as before.	280	LM			
NP	<u>Knot, prime, stop. Prepare and apply two undercoats and one finishing coat gloss paint on woodwork internally.</u>		SM			
	General surfaces	320	LM			
	Surfaces not exceeding 100mm girth.	360	LM			
	Ditto 100 - 200mm girth	360				
	<u>The following in wardrobes (10 No.) size 2850mm wide x 2500mm high x 600mm deep in bedrooms</u>		SM			
	100mm thick plain concrete (class Q) plinth.	34	LM			
	Sawn formwork to edge of plinths 75 - 150mm girth	54				
	<u>CARRIED TO COLLECTION</u>			KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>						
<u>TWO BEDROOM UNITS; JOINERY AND FIXTURES</u>						

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
AB	Fillet planted on formwork to form 30 x 70mm rebate.	54	LM			
	20mm cement and sand (1:3) screed as before.	34	SM			
CDE	<u>Wrot Cypress</u>					
F	75 x 50mm rebated door frame	160	LM			
G	75 x 50mm transome ditto	54	LM			
	75 x 50mm mullion	114	LM			
H	50 x 25mm bearer	274	LM			
	20mm diameter quadrant	160	LM			
JK	<u>Blockboard</u>					
L	25mm thick ordinary blockboard lipped all round in shelves etc.	106	SM			
	25mm Diameter chromium plated hanging rail, 800mm long including end fixing brackets.	60	NO			
	Ditto shoe rack 800mm long including fixing brackets.	120	NO			
MNP	Prepare and apply one coat of aluminium wood primer before fixing on backs of wood surfaces not exceeding 100mm girth as before.	174	LM			
	<u>Knot, prime, stop. Prepare and apply two undercoats and one finishing coat gloss paint on woodwork internally.</u>					
	General surfaces	240	SM			
	Surfaces not exceeding 100mm girth.	274	LM			
	Ditto 100 - 200mm girth	214	LM			
	<u>CARRIED TO COLLECTION</u>			KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>						
<u>TWO BEDROOM UNITS; JOINERY AND FIXTURES</u>						

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>ELEMENT NO. 10 JOINERY AND</u>					
	<u>FIXTURESCOLLECTION</u>					
	Brought forward from page 7/23					
	Brought forward from page 7/24					
	Brought forward from page 7/25					
	Brought forward from page 7/26					
	Brought forward from page 7/27					
	<u>TOTAL FOR ELEMENT NO. 10</u>					
	<u>CARRIED TO SUMMARY</u>					
				KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I,</u>					
	<u>SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; JOINERY AND FIXTURES</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>ELEMENT NO. 11</u>					
	<u>MECHANICAL INSTALLATIONS; PLUMBING AND DRAINAGE</u>					
	<u>SANITARY FITTINGS</u>					
	<u>NOTE: TRADE NAMES</u>					
	Where Trade names are mentioned below, the tenderer MUST provide the same materials and other brands shall not be accepted without a written authority to supply alternative brands by the Engineer or the Architect. The equivalent in "Twyford" range are acceptable.					
	<u>Water Closet</u>					
A	White vitreous China dual flush, close coupled W.C. suite comprising of closet "P" or "S" trap, 6 litres cistern with valveless fittings including syphon, internal overflow, 1/2" bottom inlet connection, chrome plated flushing button, heavy duty plastic seat and cover, pan plugged and screwed to concrete floor and bedded in mastic and cistern fixed to walls to be as "Lecico" or equal an approved	40	NO			
	<u>Water Closets Accessories</u>					
B	Necessary W.C. connector to drain pipe to form P or S trap	40	NO			
C	White vitreous china built in toilet roll holder size 205 x 150mm as "Lecico" or equal and approved	40	NO			
D	15mm diameter flexible connectors, 300mm long complete with chrome plated angle valve including union jointing to steel tubing and the sanitary fittings	40	NO			
	<u>Wash Hand Basins - Wall mounted</u>					
E	White vitreous china wash hand basin size 350 x 445mm "Nova" complete with 1 No. chrome plated pillar tap "Vado" or equal and approved	40	NO			
	<u>CARRIED TO COLLECTION</u>			KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; MECHANICAL INSTALLATIONS; PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>WHB Accessories</u>					
A	Plastic bottle trap 1¼" with 75mm seal, 32mm chrome plate waste, plug, chain and stay and adjustable inlet pipe and extension pipe to wall and flange	40	NO			
B	15mm diameter flexible connectors, 300mm long complete with chrome plated angle valve including union jointing to steel tubing and the sanitary fittings	40	NO			
C	Pair of cast iron brackets and screw to wall bolts	40	NO			
	<u>Kitchen Sink and Accessories</u>					
D	Associated Steel Ltd single bowl, single drainer size 1000 x 500mm wide with 1 No. 420 x 355 x 300mm deep bowl for counter top mounting including setting opening in concrete slab	20	NO			
E	12mm chrome plated heavy duty wall type kitchen mixer with approved handles and over arm swivel outlet	20	NO			
F	Chrome plated heavy duty 1½" sink waste, outlet, 86mm diameter flange, 93mm long shank, unslopped with plug and backnut	20	NO			
G	Plastic P-trap	20	NO			
	<u>Shower fittings</u>					
	<u>Bricon heavy duty built-in shower fittings as:-</u>					
H	450mm long chromium coated shower arm with end bend, threaded on both sides ready to receive instant water shower heater	40	NO			
J	15mm diameter galvanized mild steel shower riser complete with bend and threaded ends for connection to the water supply pipe adapter on one end and shower arm to the other end	40	NO			
	<u>CARRIED TO COLLECTION</u>			KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; MECHANICAL INSTALLATIONS; PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
A	Shower bib tap complete with galvanized mild steel nipple connection as "pegler" or other equal an approved	40	NO			
B	Shower stop cork in chrome plate steel as "peglar" or other equal and approved	40	NO			
	<u>Mirrors</u>					
C	610 x 457 x 6mm thick plate glass mirrors with bevelled edges fixed with chromium plated domed headed screws	40	NO			
	<u>CARRIED TO COLLECTION</u>			KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I,</u> <u>SECTOR A - HOMABAY COUNTY</u> <u>TWO BEDROOM UNITS; MECHANICAL INSTALLATIONS; PLUMBING AND DRAINAGE</u>						

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>WATER SUPPLY</u>					
	<u>Rising main and feeds</u>					
	<u>Schedule 40 (SCH40) ASTM uPVC solvent welded plumbing system as per ASTM D-1785 and fittings as per ASTM D-2466, all traded as 'Astral aquarius'</u>					
A	Excavate trench for small diameter pipes average 600mm deep part return ram and reminder cart away.	50	LM			
BCDE	32mm diameter pipe laid and jointed in trench	50	LM			
FG	15mm Diameter pipe in walls, roof space etc	450	LM			
	20mm Ditto in overflow	50	LM			
HJ KL	Make holes in 200mm thick walls for small pipes	33	NO			
M N P	Ditto in 150mm thick reinforced concrete slab (measured separately)	33	NO			
Q	Splay cut end of 20mm diameter pipe	17	NO			
	<u>Extra over uPVC pipe for:</u>					
	15mm diameter bend/elbow	50	NO			
	20mm ditto	50	NO			
	25mm ditto	50	NO			
	25-15mm diameter reducing bend	30	NO			
	25-15mm diameter reducing bush	30	NO			
	15mm diameter equal tee	20	NO			
	25mm ditto	20	NO			
	20 x 20 x 15mm ditto	20	NO			
	<u>CARRIED TO COLLECTION</u>			KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; MECHANICAL INSTALLATIONS; PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
A	25mm diameter plug	20	NO			
	<u>Gate Valve</u>					
B	15mm diameter approved high pressure screw-down full way non-rising stem, solid wedge disc gate valve to BS.5154 PN 16 for series B Rating with wheel head and joints to steel tubing as "Crane Model No.156" or equal and approved	60	NO			
CD	20mm ditto	0	NO			
	25mm ditto	40	NO			
E	<u>Non return valve</u>					
	15mm diameter approved none-return valve as 'Peglar' or equal and approved	40	NO			
	<u>Water Storage Tanks</u>					
F	Rotationally moulded cylindrical plastic tank of nominal capacity 920 litres (200 gal.) and size 1090mm diameter x 1060mm high manufactured from polythene products and protected against damage by ultraviolet radiation. The tank shall as manufactured by 'ROTO' or equal and approved and shall be completed with: * 2 x 15mm diameter inlet pipe connection * 2 x 20mm diameter outlet pipe connection * 20mm diameter overflow pipe connection * 15mm diameter high pressure ball valve	20	NO			
G	<u>Sterilization</u>					
	Allow for sterilization of the entire plumbing installations.		ITEM			
	<u>CARRIED TO COLLECTION</u>			KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>						
<u>TWO BEDROOM UNITS; MECHANICAL INSTALLATIONS; PLUMBING AND DRAINAGE</u>						

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
A	<u>Testing & Commissioning</u>					
	Allow for setting to work, testing and commissioning for cold and hot water installations		ITEM			
	<u>FOUL WATER DRAINAGE</u>					
	<u>Supply and fix uPVC soil system and MuPVC waste systems with screwed and socketed joints. Solvent welded joints shall be as per the systems manufacturer's written instructions. Tenderers must allow in their pipe work prices for all the couplings, connectors, joints etc as required in the running lengths of pipe work and also where necessary, for pipe fixing clips, holderbats plugged and screwed.</u>					
	<u>Note: Trade Names</u>					
	Caradon Terrain Ltd's pipe and fittings have been used as a guide to the type and quality of materials required. Other brands must be equal and approved in writing by the Engineer before installation. One Brand only shall be used and inconsistency shall not be accepted					
	<u>MuPVC Waste System conforming to BS.5255</u>					
BCDE	100mm diameter waste pipe	120	LM			
FG	Ditto boxed in cement and sand mortar (1:3)	120	LM			
	75mm diameter waste pipe	0	LM			
	Ditto boxed in cement and sand mortar (1:3)	0	LM			
	40mm ditto	90	LM			
	32mm ditto	20	LM			
	<u>CARRIED TO COLLECTION</u>			KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; MECHANICAL INSTALLATIONS; PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>Extra over MuPVC waste pipe work for the following:</u>					
ABCD	40mm diameter bend	30	NO			
EFGH	32mm ditto	30	NO			
J	100mm diameter long radius bend	20	NO			
	75mm ditto	0	NO			
KLM N	40mm diameter sweep tee	30	NO			
	32mm ditto	20	NO			
P	100mm diameter equal tee	30	NO			
QRST	Ditto W.C. connecting bend	20	NO			
	100mm diameter Shower floor Trap, chrome as "Metro ref. STFG 56.43 complete with inlet and grill	40	NO			
	<u>Extra over uPVC soil pipe work for the following:-</u>					
	100mm diameter single branch	20	NO			
	32-100mm Boss connector	20	NO			
	40-100mm ditto	30	NO			
	40-75mm ditto	0	NO			
	100mm diameter weathering apron including fixing over roofing sheets	10	NO			
	100mm Access cap	7	NO			
	40mm ditto	3	NO			
	32mm ditto	0	NO			
	100mm Vent cowl	10	NO			
	<u>CARRIED TO COLLECTION</u>			KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; MECHANICAL INSTALLATIONS; PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
ABC	75mm ditto	0	NO			
	100mm diameter pipe wall holder bat	90	NO			
DEF	75mm ditto	0	NO			
G	<u>uPVC buried drain system</u>					
	200mm buried drain pipe	33	LM			
HJ	150mm buried drain pipe	67	LM			
	100mm ditto	20	LM			
	Concrete (1:3:6) in bed and surround to 200mm diameter pipe	33	LM			
	Ditto 150mm diameter	16	LM			
	Ditto 100mm diameter	16	LM			
	<u>Inspection chambers</u>					
KLM N	<u>Chambers consisting of 100mm thick concrete (1:3:6) bed and 250mm water proof cement sand (1:4) benching, 125mm concrete (1:2:4) cover slab with opening for manhole cover; 150mm masonry stone walling finished in water proof plaster complete with medium duty cast iron manhole cover and frame set in grease including all necessary excavations and disposals</u>					
	Ditto 600 x 450 x 500mm deep	3	NO			
	Ditto 750mm deep	3	NO			
	800 x 600 x 750mm deep	7	NO			
	Ditto 1000mm deep	7	NO			
	<u>CARRIED TO COLLECTION</u>			KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>						
<u>TWO BEDROOM UNITS; MECHANICAL INSTALLATIONS; PLUMBING AND DRAINAGE</u>						

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
A	<u>Gulley Trap</u>					
	Chamber size 300 x 300 x 450mm deep comprising 75mm diameter PVC gulley trap with inlet and outlet including 100mm thick concrete (1:3:6) bed, 100mm thick plastered concrete walls complete with mild cover and all necessary excavations and disposals	10	NO			
	<u>Excavation</u>					
	Excavate trench from ground level for buried drain pipes not exceeding 200mm diameter and 1.50m deep, average 1000mm deep, part return, fill in, ram and remainder cart away.	16	LM			
	Ditto average 1250mm deep	67	LM			
	Extra over for excavation in rock class 1.	3	CM			
	Ditto for rock class 3.	3	CM			
	<u>Testing and commissioning</u>					
	Allow for setting to work, testing and commissioning for foul water drainage system.		ITEM			
	<u>FIRE FIGHTING</u>					
G	<u>Water portable fire extinguisher</u>					
	9 litres water portable fire extinguisher complete with nozzle, pressure gauge, initial charge and mounting brackets.	NO	5			
	<u>Carbon dioxide (CO2) gas portable fire extinguisher</u>					
H	5.0 Kg carbon dioxide gas portable fire extinguisher complete with nozzle, pressure gauge, initial charge and mounting brackets.	NO	5			
	<u>CARRIED TO COLLECTION</u>			KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>						
<u>TWO BEDROOM UNITS; MECHANICAL INSTALLATIONS; PLUMBING AND DRAINAGE</u>						

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
A	<u>Fire blanket</u>					
	Fire blanket made of cloth woven with fire proof material and measuring 1800 x 1210mm, and fitted with special tapes folded to offer instantaneous single action to release blanket from storing jacket. Manufactured to BS 1721.	NO	20			
	<u>CARRIED TO COLLECTION</u>			KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I,</u> <u>SECTOR A - HOMABAY COUNTY</u> <u>TWO BEDROOM UNITS; MECHANICAL INSTALLATIONS; PLUMBING AND DRAINAGE</u>						

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>ELEMENT NO. 11</u>					
	<u>MECHANICAL INSTALLATIONS; PLUMBING AND DRAINAGE</u>					
	<u>COLLECTION</u>					
	Brought forward from page 7/29					
	Brought forward from page 7/30					
	Brought forward from page 7/31					
	Brought forward from page 7/32					
	Brought forward from page 7/33					
	Brought forward from page 7/34					
	Brought forward from page 7/35					
	Brought forward from page 7/36					
	Brought forward from page 7/37					
	Brought forward from page 7/38					
	<u>TOTAL FOR ELEMENT NO. 11</u>					
	<u>CARRIED TO SUMMARY</u>			KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I,</u>					
	<u>SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; MECHANICAL INSTALLATIONS; PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>ELEMENT NO. 12 ELECTRICAL</u>					
	<u>INSTALLATIONS</u>					
	<u>Supply, install, test and commission the following to work:</u>					
A	Lighting points wired in 3 x 1.50mm ² PVC insulated single core cables (SC) copper drawn in 20mm diameter heavy gauge PVC conduits concealed in walls & floors.	120	NO			
B	Ditto but two way	100	NO			
	<u>Supply and install the following accessories as "MK"</u>					
C	10A plate switch one gang one way as "Schneider Electric" Cat. No. GGBL 1011	40	NO			
D	10A plate switch one gang two way as "Schneider Electric" Cat. No. GGBL 1012	60	NO			
E	10A plate switch two gang two way as "Schneider Electric" Cat. No. GGBL 1022	40	NO			
F	10A intermediate switch as "Schneider Electric" Cat. No. GGBL 1014	5	NO			
G	Columbus Electronic Time elay with 1 - 25 minutes adjustable timer as "ABB/ELKAY" Cat. No. 400E	5	NO			
H	Ceiling rose pendant set complete with B22 holder and LED energy saving lamps as "MK" Cat. No. 1149 WHI	60	NO			
J	1200mm long 16W, 1600 lumens warm white LED fitting complete with control gear as 'Philips' Cat. No. BN016C LED16/CWL1200 GM	20	NO			
	<u>CARRIED TO COLLECTION</u>			KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; ELECTRICAL INSTALLATIONS</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>Supply and install the following lighting fittings</u>					
A	IP44 circular surface fixed luminaire with black polycarbonate base, opal diffuser and E27 LED lamp as "MASSIVE CASABLANCA" cat. No. 71416/01/30	40	NO			
B	Straight battern lamp holder complete with B22 holder and energy saving lamps	20	NO			
C	Angled wall bracket lamp holder complete with B22 holder and LED lamps as "MK" Cat. No. 1152WHI	20	NO			
D	Circular surface-mount luminaire with opal polycarbonate finish complete with E27 60W lamp holder as "OMS" Cat. No. OMS CAT PLAST 3 1X60W	20	NO			
E	Oval - shaped weatherproof LED bulkhead rated 15W, 1500 lumens	9	NO			
F	320mm diameter surface-mount 18W LED (>100lm/W) luminaire with opal diffuser finish in staircase as "LUCESCO" LBSR33w12S40	10	NO			
GH	Photocell as "Lucy Zodion" Cat. No. super 6	1	NO			
	Allow for 10A block connectors in lighting conduit boxes for the above light fittings	322	NO			
	<u>POWER POINTS AND OUTLETS</u>					
	<u>Supply, install, test and commission the following to work complete with CLIPSAL accessories</u>					
J	13 AMPs ring twin socket outlet points wired in 3 x 2.50mm ² PVC Single Core copper cable drawn in 20mm diameter heavy gauge PVC conduits concealed in the walls and floors, one way switched with all accessories but excluding the socket outlet plate	200	NO			
	<u>CARRIED TO COLLECTION</u>			KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>						
<u>TWO BEDROOM UNITS; ELECTRICAL INSTALLATIONS</u>						

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
A	Cooker Circuit wired in 3 x 6mm ² PVC single core copper cables drawn in 20mm heavy gauge PVC conduits concealed in the walls and floors, one way switched with and including all accessories but excluding the cooker control unit	20	NO			
B	Outlet for cooker connector unit comprising single box 25mm diameter conduits, wiring in 3 x 6.00mm ² SC PVC CU cables to the cooker control unit with and including all accessories but excluding the cooker connector unit	20	NO			
C	Water Heater circuit wired in 3 x 4.00mm ² PVC SC copper cables drawn in 20mm HG PVC conduits concealed in the walls and floors complete with all accessories and three meters of 4mm ² three core flex, but excluding the D.P. switch.	0	NO			
D	Ditto but wired for Instant Water Heater with 3 x 4.00mm ² PVC SC in 25mm PVC conduit	20	NO			
E	20 AMP DP switch with flex outlet in base, neon light marked "Water Heater" as "Schneider Electric" Cat. No. GGBL2014WH	20	NO			
F	Allow for connection of water heater element with 3 x 2.50mm ² heat resistant cable (max meters)	0	LM			
G	Allow for conduiting & blanked out boxes for future pump installations in 32mm diameter HG PVC conduit (each 32metres) complete with blanking plate (3 No.)		ITEM			
H	Electric bell circuit wired in 3 x 1.50mm ² single core PVC copper cables drawn in 20mm HG PVC conduits complete with all accessories but excluding the bell chime and push	4	NO			
J	Electric bell circuit wired in 1.50m ² single core PVC copper cables drawn in 20mm HG PVC conduits complete with all accessories but excluding the bell chime to link to upper floors	16	NO			
K	Allow for engraving of switches - "Bell switch"	20	NO			
	<u>CARRIED TO COLLECTION</u>			KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; ELECTRICAL INSTALLATIONS</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
A	Wired, dual-tone door chime complete with 240/12 Volts transformer with white polycarbonate finish as "HONEYWELL/FRIEDLAND" Cat. No. D3126 FESTIVAL	20	NO			
B	10A one gang bell push switch with a wide rocker as "Schneider Electric" Cat. No. GGBL 1012RB	20	NO			
C	13A Weatherproof single switched socket as "Schneider Electric" Cat. No. LWP3010	20	NO			
D	13 Amps Single switched sockets as "Schneider Electric" Cat. No. GGBL3010D	0	NO			
E	13 Amps Twin switched sockets as "Schneider Electric" Cat. No. GGBL3020D	200	NO			
F	45A D.P Cooker control unit with single 13A switch socket outlet complete with neon lights as "Schneider Electric" Cat. No. GGBL4001	20	NO			
G	Flush cooker connection unit as as "Schneider Electric" Cat. No. GGBL4050	20	NO			
<u>TELEPHONE & TELEVISION OUTLETS</u>						
<u>Supply, install, test and commission:-</u>						
H	32mm Diameter H.G. PVC Conduits for linking the adaptable boxes concealed in the walls and floor with all accessories for Telephone	200	LM			
J	32mm Diameter H.G. PVC Conduits for linking the adaptable boxes concealed in the walls and floor with all accessories for Television (T.V.)	200	LM			
K	38mm Diameter H.G. PVC Conduits for linking the adaptable boxes concealed in the walls and floor with all accessories for Power	200	LM			
CARRIED TO COLLECTION				KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>						
<u>TWO BEDROOM UNITS; ELECTRICAL INSTALLATIONS</u>						

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
A	Telephone outlet point comprising of 20mm diameter HG PVC conduits and draw wire, concealed in walls and floors	20	NO			
B	TV/FM & Satellite outlet point comprising of 20mm diameter HG PVC conduits and draw wire, concealed in walls and floors for local channels	20	NO			
C	TV/FM & Satellite triplexer socket outlet (IEC male) as "Schneider Electric" Cat. No. GGBL7081	40	NO			
D	One gang euro plate with module adapter and RJ45 Cat6 module as "Schneider Electric" Cat. No. GGBL7071C6	40	NO			
<u>SUB MAINS AND DISTRIBUTION</u>						
E	Supply and install 6-way SPN consumer unit as "Schneider" complete with 63A/30mA DP RCBO integral isolator for flush mounting and the following MCB's as "Schneider Electric" 32A; 2 No., 20A; 2 No., 10A; 1 No. with 1 No. blanking plates	20	NO			
F	Ditto but 4-way with the following MCB's as "Schneider Electric", 20A; 2 No., 10A; 1 No. with 1 No. blanking plates	0	NO			
G	Carry out very concise permanent labelling for all the sub circuits in the board as before described (160 No.)		ITEM			
H	Sub-mains comprising of 3 x 16mm ² SC copper cables drawn in 38mm HG PVC conduits from the switchboard to the consumer unit as before described.	514	LM			
I	225 x 225 x 50mm deep 14 gauge galvanized iron sheet adaptable box complete with cover (IP-65)	20	NO			
CARRIED TO COLLECTION				KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I,</u>						
<u>SECTOR A - HOMABAY COUNTY</u>						
<u>TWO BEDROOM UNITS; ELECTRICAL INSTALLATIONS</u>						

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>One off wall free standing Lockable Main meter board, metal clad, cubicle pattern Type tested to IP44, Form 2b comprising the following:-</u>					
ABC	Set of 1 No. 180A TPN buss bar					
D	Buss bar Chamber					
EF	21 No. 63A DP MCCB out goers (16kA)					
	Sufficient capacity for 3 No. Sets of KPLC's cut-outs, 21No. KWH meters.					
	Sufficient knock-outs for incoming/outgoing cables					
	Perspex viewing windows for the meters	1	NO			
G	<u>Supply and install the following as described:-</u>					
H	Supply and install Earthing for the above meter board, complete with Earthing Matt measuring 1.0 x 1.0m built in 25mm x 3mm thick riveted with copper rivets (Total length of copper tape required 20m). 4 No earth electrodes, and 4 No. Rod to tape clamps. The earth					
J	matt to be treated by charcoal and salt to obtain reading of < (less than) 1.0 ohms.		ITEM			
K	Supply and install 16mm Ø; 1800mm long copper earth electrode complete with test clamp	1	NO			
	Supply and install 300mm x 300mm concrete earth inspection pit complete with heavy duty manhole covers.	1	NO			
	Supply and install Equipotential Bar measuring 600mm long x 50mm width x 6mm thick complete with insulators, 12Nos. M8 bolts and nuts		ITEM			
	CARRIED TO COLLECTION			KShs.		
	<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>					
	<u>TWO BEDROOM UNITS; ELECTRICAL INSTALLATIONS</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
A	Supply and install 1 x 35mm ² PVC/PVC Earth lead from Matt to Equipotential bars (2 No.)	10	LM			
BC	PG cable glands for item above	1	NO			
D	PG cable lugs for item above	1	NO			
E	Provide workshop drawings for Ground floor and typical first floor		ITEM			
F	Provide record drawings for Ground floor and typical first floor		ITEM			
G	Kenya Power and Lighting Company Limited liaison and Attendance including initial application, documentation, follow-up, issuance of Completion Certificate and Test Reports.		ITEM			
	Testing, Commissioning and Hand over the entire Installation to the Electrical Engineer's Satisfaction.		ITEM			
H	<u>LIGHTNING PROTECTION</u>					
J	Air termination Type Furse RA225 + RA600 fixed to ridge saddle FurseSD155 bolted to roof with water tight rubber washers	NO	2			
K	25mm x 3mm copper tape TC030 on tape clip Furse CP210 fixed at 750mm intervals to approved detail	LM	50			
L	50mm ² PVC insulated copper conductor enclosed in 25mm dia HG concealed PVC conduit between copper tape and test joint	LM	6			
M N	Lugs for item K above including fixing bolts to roof conductors	NO	4			
P	Test clamps Furse CN305	NO	4			
	Rod to earth conductors clamps Furse CR520	NO	4			
	Earth rods Furse RC015 with driving sud, furse ST015 and spike furse SP015 driven into ground	NO	4			
	CARRIED TO COLLECTION			KShs.		
<u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u>						
<u>TWO BEDROOM UNITS; ELECTRICAL INSTALLATIONS</u>						

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
AB	50mm ² ECC in 1 x 25mm dia PVC conduit between the test clamp and the earth rods	LM	6			
C	125 x 100 x 50mm deep boxes with cover and marked safety earth installed columns to approved detail	NO	4			
	Concrete earthing inspection pits, Furse PT-005	NO	4			
	CARRIED TO COLLECTION			KShs.		
PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY TWO BEDROOM UNITS; ELECTRICAL INSTALLATIONS						

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	ELEMENT NO. 12 ELECTRICAL INSTALLATIONSCOLLECTION					
	Brought forward from page 7/40					
	Brought forward from page 7/41					
	Brought forward from page 7/42					
	Brought forward from page 7/43					
	Brought forward from page 7/44					
	Brought forward from page 7/45					
	Brought forward from page 7/46					
	Brought forward from page 7/47					
	TOTAL FOR ELEMENT NO. 12 CARRIED TO SUMMARY					
				KShs.		
	PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY TWO BEDROOM UNITS; ELECTRICAL INSTALLATIONS					

ITEM	DESCRIPTION	SHS	CTS																										
	<p align="center"><u>20 No. ONE BEDROOM UNITS</u></p> <p align="center"><u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u></p> <p align="center"><u>SUMMARY</u></p> <table><tr><th><u>DESCRIPTION</u></th><th><u>PAGE NO.</u></th></tr><tr><td>1 SUB-STRUCTURES</td><td>7/05</td></tr><tr><td>2 REINFORCED CONCRETE STRUCTURE</td><td>7/07</td></tr><tr><td>3 WALLING</td><td>7/08</td></tr><tr><td>4 ROOFING</td><td>7/11</td></tr><tr><td>5 DOORS</td><td>7/13</td></tr><tr><td>6 WINDOWS</td><td>7/15</td></tr><tr><td>7 FINISHES</td><td>7/19</td></tr><tr><td>8 PAINTING AND DECORATION</td><td>7/20</td></tr><tr><td>9 BALUSTRADING</td><td>7/22</td></tr><tr><td>10 JOINERY AND FIXTURES</td><td>7/28</td></tr><tr><td>11 PLUMBING AND DRAINAGE</td><td>7/39</td></tr><tr><td>12 ELECTRICAL INSTALLATIONS</td><td>7/48</td></tr></table> <p><u>TOTAL AMOUNT FOR 1 NO. 2 BEDROOM APARTMENT BLOCK IN THE PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u></p> <p align="right">KShs.</p> <p>x 2 for 2 No. Blocks</p> <p><u>TOTAL AMOUNT FOR 2 NO. 2 BEDROOM APARTMENT BLOCK IN THE PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u></p> <p align="right">KShs.</p> <p><u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT; PHASE I, SECTOR A - HOMABAY COUNTY</u></p> <p><u>TWO BEDROOM UNITS; MAIN SUMMARY</u></p>	<u>DESCRIPTION</u>	<u>PAGE NO.</u>	1 SUB-STRUCTURES	7/05	2 REINFORCED CONCRETE STRUCTURE	7/07	3 WALLING	7/08	4 ROOFING	7/11	5 DOORS	7/13	6 WINDOWS	7/15	7 FINISHES	7/19	8 PAINTING AND DECORATION	7/20	9 BALUSTRADING	7/22	10 JOINERY AND FIXTURES	7/28	11 PLUMBING AND DRAINAGE	7/39	12 ELECTRICAL INSTALLATIONS	7/48		
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12 ELECTRICAL INSTALLATIONS	7/48																												

SECTION EIGHT BUILDER'S
WORK ONE- BEDROOM UNITS
2NO. BLOCKS
BILL NO. 3

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO. 1 SUBSTRUCTURES</u>					
	<u>(ALL PROVISIONAL)</u>					
	<u>EXCAVATIONS AND EARTHWORK</u>					
A	Allow for keeping the whole of the excavation free from all spring and running water by pumping or any other such means as may be necessary	ITEM				
B	Allow for maintaining and upholding the sides of excavations and keeping excavations clear of all fallen materials, rubbish etc	ITEM				
C	Excavate 200mm thick overstrip in vegetation and loose murrum to remove top vegetable soil commencing from existing ground level	SM	210			
D	Excavate foundation trenches to reduce levels not exceeding commencing from stripped level	CM	99			
	Ditto exceeding 1.50M deep but not exceeding 3.0M deep					
EF	Excavate pits for bases not exceeding 1.50M commencing from reduced levels	CM	27			
		CM	36			
GH	Ditto exceeding 1.50M deep but not exceeding 3.0M deep					
		CM	10			
JK	Extra over Excavation in any position for excavating in rock class 3Ditto	CM	9			
	rock class 1					
L	Return, fill in and well consolidate selected excavated material around foundations	CM	2			
		CM	79			
	Remove all surplus excavated materials from site					
		CM	82			
	<u>CARRIED TO COLLECTION</u>					
	<u>SUBSTRUCTURE</u>					
				KSHS.		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	(EXCAVATIONS AND EARTHWORK.....CONT'D)					
	<u>FILLING</u>					
A	Selected excavated material or other approved imported 150mm layers including ramming ground under	CM	152			
BC	300mm Thick hardcore filling ditto to receive floor slabs	SM	132			
	50mm Thick murram blinding well watered and rolled on top of hardcore	SM	132			
D	<u>Anti-termite treatment</u>					
	Treat the top surface of hardcore and excavated plinths with 'Premise 200 SC' or 'Mchwatox 350 SC' or any other equal and approved insecticide to be applied by a specialized firm as Insecta Ltd or Rentokil Ltd or any firm registered with Pest Management Association of Kenya (PEMAK). A printed Certificate of Guarantee for a period of 10 years to be provided before payment.	SM	132			
E	Level and compact bottoms of excavated foundations and bases as directed on site	SM	121			
FG	<u>Mass Concrete (1:4:8)as described in:-</u>					
	50mm Thick blinding under foundations	SM	97			
	Ditto to column bases	SM	24			
HJ K	<u>Vibrated reinforced concrete</u>					
LM	<u>Class 25/20 mix 1:11/2:3 in:-</u>					
	Foundation footing	CM	19			
	Column bases	CM	7			
	Columns	CM	4			
	Ramp	CM	1			
	150mm Thick ground floor slab.	SM	163			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>SUBSTRUCTURE</u>					

[illegible]

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>WALLING</u>					
	<u>Natural stone wall bedded and jointed in cement and sand (1:4) mortar in:-</u>					
A	200mm Thick selected approved quality natural stone (7N/mm ²) or other equal and approved block walling dressed :including double dressing to corner blocks:in cement and sand (1:3) mortar : 20 gauge x 25mm wide hoop iron in every alternate course: to	SM	268			
	<u>PLINTHS</u>					
	<u>Cement and sand (1:3) render as described in:-</u>					
B	13mm Thick with wood float finish to vertical surfaces	SM	37			
	<u>Prepare and apply three coats first grade plastic emulsion paint as described on:-</u>					
C	Vertical rendered surfaces	SM	37			
	<u>Precast concrete paving slabs</u>					
D	600 x 600 x 50mm Thick precast concrete paving slabs laid on and including 50mm Thick sand bed jointed and pointed in cement and sand (1:4) mortar	SM	47			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>COLLECTION PAGE</u>					
	Brought forward from page 8/01					
	Brought forward from page 8/02					
	Brought forward from page 8/03					
	Brought down from above					
	<u>TOTAL ELEMENT NO 1 - SUBSTRUCTURE</u>					
	<u>CARRIED TO SUMMARY OF BILL NO2</u>			KSHS.		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
ABC D EFG HJ K	<u>REINFORCEMENT (ALL PROVISIONAL)</u> <u>Hot rolled,ribbed high yied mild steel reinforcement bars to BS 4449 including soft iron tying wire and concrete spacer blocks in:-</u>					
	8mm Diameter	KG	8,125			
	10mm Diameter	KG	748			
	12mm diameter	KG	5,768			
	16mm diameter	KG	785			
L M N	<u>Sawn formwork to:-</u>					
	Sides and soffits of beams	SM	605			
	Sides of columns	SM	408			
	Horizontal soffites of landing	SM	16			
	Slopping soffits of stairs	SM	29			
	Soffites of suspended slabs	SM	595			
	Edges of suspended slab 75 -150mm high	LM	368			
	Edges of landing 75 - 150mm high	LM	21			
	Edges of riser 75 - 150mm high	LM	117			
	Edges of staircase strings 400mm wide(extreme) including cutting to form profile of treads and risers	LM	22			
<u>CARRIED TO COLLECTION</u>				KSHS.		
<u>COLLECTION PAGE</u>						
Brought forward from page 8/05						
Brought down from above						
<u>TOTAL OF ELEMENT NO.2 -CONCRETE IN SUPERSTRUCTURE</u>						
<u>CARRIED TO SUMMARY OF BILL NO 2</u>				KSHS.		
<u>CONCRETE IN SUPERSTRUCTURE</u>						

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO. 3WALLING</u>					
	<u>DAMP PROOF COURSE</u>					
	<u>Hessian based bituminous felt damp proof course laid on and including cement and sand (1:4) mortar in:-</u>					
AB	200mm wide	LM	134			
	100mm wide	LM	10			
	<u>EXTERNAL WALLS</u>					
	<u>Selected approved quality machine cut stone (7N/mm²) or other equal and approved block walling dressed :including double dressing to corner blocks:in cement and sand (1:3) mortar : 20 gauge x 25mm wide hoop iron in every alternate course: to</u>					
CDE						
F	200mm thick walling	SM	642			
	Ditto Tank room Walling	SM	36			
	Ditto Parapet walling	SM	79			
	Extra over ditto	SM	757			
	<u>INTERNAL WALLS</u>					
GH	<u>Selected approved quality machine cut stone (7N/mm²) or other equal and approved block walling dressed :including double dressing to corner blocks:in cement and sand (1:3) mortar : 20 gauge x 25mm wide hoop iron in every alternate course: to</u>					
	200mm thick walling	SM	455			
	100MM thick Walling	SM	136			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>WALLING</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
<u>ELEMENT NO. 4ROOFING</u>						
A	20mm thick cement sand (1:4) laid to fall of screed with and including water proof additive to receive roofing felt	SM	133			
BC	Ditto to parapet walling 600mm high	LM	124			
D	4mm thick modified bituminous as APP bituminous membrane torch bonded including priming surfaces with bituminous primerand dressing around surfaces	SM	133			
EFG	Ditto to parapet walling	LM	124			
<u>The Following Flat roof finishes fixed with approved adhesive</u>						
H	20mm thick interlocking Concrete tiles of size 225 x 225mm	SM	133			
	100mm diameter plastic fulbora outlet cast in concrete	NO	4			
	Triangle fillet size 25 x 25mm	LM	124			
J KL	<u>Sundries</u>					
M	Groove in walling for turn in waterproofing membrane	LM	124			
<u>24 Gauge Prepainted galvanized iron in:-</u>						
	Ditto but for 90 degrees bends	NO	4			
	100 x 75mm Down pipe	LM	60			
N	Extra over down pipe for sawnneck 600mm wide	NO	4			
	Ditto but shoe.	NO	4			
<u>PAINTING AND DECORATION</u>						
<u>Prepare and apply two coats of zinc chromate primer and one finishing coat of gloss oil paint as manufactured by Duracoat or other equal and approved paints as described on:-</u>						
	Metal surfaces 200 - 300 girth externally	LM	60			
<u>TOTAL FOR ELEMENT NO. 4 - ROOFING</u>				KSHS.		
<u>CARRIED TO SUMMARY OF BILL NO.2</u>					683,212	

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO.5DOORS</u>					
	<u>EXTERNAL DOORS</u>					
	<u>Take delivery on site, store and fix the following steel door:-</u>					
A	Steel casement door overall size 900x2550mm high in standard door glazing sections consisting of fixed light top section size 900x300mm high and openable bottom section size 900x2100mm high with 900x300mm metal sheet at the bottom complete with necessary ironmonger,18No.small glazing obscure panes size 300x300mm fixed with putty to steel door.	NO	40			
B	Ditto size 2000x2550mm high double opening door leaf consisting of two no equal sizes door flap on both sides with 6no panels to details.	NO	1			
	<u>INTERNAL DOORSFLUSH</u>					
	<u>DOORS</u>					
	<u>Supply and fix the Wrot prime grade cypress in following -:</u>					
C	45mm Thick semi-solid core flush door size 725 x 2250mm high	NO	20			
D	Ditto size 825 x 2250mm high	NO	40			
	<u>FRAMES AND FINISHINGS</u>					
	<u>Supply and fix Wrot prime grade cypress in:-</u>					
EFG	20 x 15mm Glazing bead	LM	252			
H	20mm thick quadrant beading	LM	360			
	38 x 20mm thick Moulded architrave	LM	360			
J	100 x 50mm thick frame plugged to wall with rawl bolt and pelleted	LM	360			
	100 x 50mm Transome with four labours	LM	72			
	<u>CARRIED TO COLLECTION</u>					
	<u>DOORS</u>					
				KSHS.		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
A	Metal Work 150mm long x 50m wide x 3mm thick fish tailed wrot iron door cramps three times bent, one end screwed into frame and the other end built in walls IRON MONGERY Supply and fix the following ironmongery complete with matching screws (Ref.is to UNION catalogue or other equal and approved)	NO	606			
BCD	Pairs of 100mm brass butt hinges	PRS	180			
	2-lever ditto	NO	60			
	100mm brass barrel bolts	NO	20			
EF	GLAZING 5mm Thick obscure glass sheet (Ordinary Quality) and glazing to metal with putty with and including setting edges of glass in wash leather in panes size:- 725 x 275mm high	NO	20			
G	825 x 275mm high	NO	20			
	PAINTING AND DECORATION Prepare and apply one coat aluminiumprimer before fixing to:					
HJ	Back of wood 0 - 100mm girth	LM	360			
	Touch up primer, prepare and apply two undercoats and one finish coat enamel paint to metal work on:-					
	Door surfaces generally	SM	184			
	Surfaces 100 - 200mm girth	LM	240			
	CARRIED TO COLLECTION DOORS			KSHS.		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
ABC	<u>Prepare, knot, prime, stop and apply two undercoats and one finishing coat gloss oil paint as described on wood work to:</u>					
	General surfaces	SM	275			
	Surfaces 100-200mm girth	LM	360			
	Surfaces 200 - 300mm girth	LM	432			
	<u>CARRIED COLLECTION</u>			KSHS.		
	<u>COLLECTION</u>					
	Brought forward from page 8/10					
	Brought forward from page 8/11					
	Brought down from above					
	<u>TOTAL FOR ELEMENT NO. 5 - DOORS</u>			KSHS.		
	<u>CARRIED TO SUMMARY OF BILL NO. 2</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
A	<u>ELEMENT NO. 6WINDOWS</u> <u>Vibrated reinforced concrete</u> <u>Class 25/20 mix 1:11/2:3 cast- insitu in:-</u> 200x75mm weathered and throated window cill with smooth finish on all exposed surfaces	LM	111			
	<u>STEEL CASEMENT WINDOWS</u> <u>Take deliery on site, store and fix the following</u> <u>steel casement windows primed with red oxide</u> <u>to head and cill and bedding frame in and water</u> <u>proof cement mortar, and pointing:-</u>					
BCD	Window size 1800 x 1350mm high (W1)	NO	20			
E	Window size 1500 x 1350mm high (W2)	NO	20			
	Window size 1000 x 1350mm high (W3)	NO	20			
	Window size 750 x 850mm high (W4)	NO	20			
FG	<u>Supply and fix the following heavy duty ironmongery</u> <u>complete with matching screws as "KENS METAL"</u> <u>or other equal and approved)</u>					
H	Window stay	NO	100			
J	Window fastener	NO	200			
	<u>Metal Work</u> 150x40x3mm Thick fish-tailed holdfast screwed to back of frames and built into walling	NO	320			
K	<u>GLAZING</u> 5mm Thick clear sheet glass and glazing to steel panes in panes exceeding 0.50 square meters but not					
L	exceeding 1.00 square metres	SM	117			
	<u>Obscure glass</u> Ditto but obscure glass	SM	13			
	<u>Curtain Rods</u> 25mm diameter chrome plated double rod complete with wall brackets and rings	LM	138			
<u>CARRIED TO COLLECTION</u> <u>WINDOWS</u>				KSHS.		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>WINDOWS (CONT'D)</u>					
	<u>Burglar-proofing bars</u>					
A	50 x 25 x 4mm thick heavy guage mild steel rectangular hollow section tubes in framework and bars in burglar proofing grilles. Fabrication finished with red oxide primer with and including building into walls and making good	SM	130			
B	Apply three coats of gloss oil paint as specified to small diameter bars	SM	260			
	<u>Render, cement and sand (1:4), Steel trowelled</u>					
CD	15mm Thick cement sand(1:4)rendering to window reveal	SM	83			
	Ditto to window trim 50mm girth	LM	417			
	<u>Painting & Decoration</u>					
	<u>Prepare including and apply three coats of premium exterior quality silk vinyl paint Paints" or equal and approved to:-</u>					
EF	Window trim and surround 50mm wide	LM	417			
	Ditto Window reveal	SM	83			
GH	<u>Prepare, prime and apply two undercoats and one Finishing coat gloss oil paint on</u>					
	Metal surfaces externally	SM	130			
	Ditto but internally	SM	130			
	<u>CARRIED COLLECTION</u>			KSHS.		
	<u>COLLECTION</u>					
	Brought forward from page 8/13					
	Brought down from above					
	<u>TOTAL OF ELEMENT NO.6 - WINDOWS</u>			KSHS.		
	<u>CARRIED TO SUMMARY OF BILL NO. 2</u>					
	<u>WINDOWS</u>					

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ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>JOINERY CONT'D</u>					
	<u>Worktop</u>					
A	65mm thick concrete (1:2:4) worktop reinforced with BRC mesh No.A142 including forming opening size 500 x 500 mm for kitchen sink .	SM	18			
BC	Sawn formwork to soffites of worktop.Ditto	SM	18			
	to edges of slab 0 - 75mm high. <u>White</u>	LM	30			
D	<u>glazed tiles</u>					
	10mm thick glazed tiles laid on worktop.	SM	18			
	<u>(End of 20No. 1500mm long Low level Kitchen worktops)</u>					
	<u>20NO. KITCHEN CUPBOARD SHELVES</u>					
	<u>The following in 20mm thick open shelves</u>					
	<u>300mm wide x 1500mm girth in 3 levels</u>					
E	<u>hardwood lipped on all edges.</u>					
FG	20mm Thick blockboard lipped with hardwood beading all round.	SM	18			
	250 x 250mm mild steel shelf bracket plugged and screwed	NO	180			
	Prepare surfaces of woodwork and apply three coats of first	SM	18			
	<u>(End of 20No. 1800mm long Low level Kitchen worktops)</u>					
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>JOINERY FITTINGS</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<p><u>ELEMENT NO. 7</u></p> <p><u>JOINERY FITTINGS AND FIXTURES</u></p> <p><u>COLLECTION</u></p> <p>Brought forward from page 8/15</p> <p>Brought forward from page 8/16</p>				0.00	
	<p><u>TOTAL FOR ELEMENT NO. 7 - JOINERY FITTINGS</u></p> <p><u>CARRIED TO SUMMARY OF BILL NO. 2</u></p> <p><u>JOINERY FITTINGS</u></p>			KSHS.		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO. 8 BALUSTRADES (ALL PROVISIONAL)</u>					
	<u>Supply and fix the following in rolled hollow sections in staircase and walkways with one coat red oxide primer as described in:-</u>					
AB	50mm dia x 3mm Circular hollow section handrail welded	LM	120			
CD	50 x 25 x 3mm Balusters 1250mm long with one end welded on handrail and other grouted and built 100mm into concrete	NO	120			
	25 x 25 x 2mm middle rails welded to balusters	LM	360			
EFG	20 x 20 x 2mm infill 750mm high with one end welded to middle rail and other hand rail	NO	120			
HJK	<u>Extra over RHS tubes for:-</u>					
L	50mm Bend	NO	40			
	50mm Endcaps	NO	96			
	Splay cutting to 50 x 50 x 3mm tubes	NO	240			
	Formed bend to 50 x 50 x 3mm tubes	NO	64			
MN	Cranked bend to 50 x 50 x 3mm tubes	NO	96			
	Welded joints between RHS members	NO	960			
	<u>SUNDRIES</u>					
	Make hole in concrete or walling 125mm deep and built in end of 50 x 25 x 3mm balusters with cement grout	NO	120			
	<u>Touch up primer, prepare and apply two undercoats and one finishing coat gloss paint to:-</u>					
	Metal surfaces	SM	300			
	Ditto 100 -200mm girth	LM	120			
	<u>TOTAL FOR ELEMENT NO. 8 - BALUSTRADES CARRIED TO SUMMARY OF BILL NO. 2</u>			KSHS.		
	<u>BALUSTRADES</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO. 9FINISHES</u>					
	<u>EXTERNAL FINISHES</u>					
	<u>Cement and sand (1:4)masonry or concrete render as described in:-</u>					
	13mm Thick with wood float to Parapet walls					
ABC	Ditto to beams	SM	79			
	Straight key pointing on machine cut stone walling with quoin teething at the edges	SM	207			
DE	<u>Prepare surfaces,apply three coats all weather low sheen paint as described on:-</u>	SM	1514			
	Rendered vertical surfaces					
	Ditto to beams	SM	79			
F	<u>INTERNAL WALL FINISHES</u>	SM	207			
	<u>Gauged cement and sand(1:2:9) plaster in:-</u>					
G	13mm Thick with steel float finish to vertical surfaces					
	<u>Cement and sand (1:5) backing in:-</u>	SM	1632			
	12mm thick with approved plasticiser and screed anti fungal Treatment finish to receive tiles (measured separately)					
H	<u>Supply and fix glazed wall tiles bedded on cement sand (1:5) backing and pointed in white cement in:-</u>	SM	307			
J	330 x 250 x 8mm thick tiles					
	<u>Prepare and apply three coats of silk vinyl paint on:-</u>	SM	307			
	Plastered surfaces					
K	<u>Prepare,apply one coat of universal under coat and two coats of super gloss paint on:-</u>	SM	1531			
	Plastered surfaces					
	<u>CARRIED TO COLLECTION</u>	SM	101			
	<u>FINISHES</u>			KSHS.		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>FINISHES CONT'D</u>					
	<u>FLOOR FINISHES</u>					
	<u>Kerbs</u>					
A	Concrete(1.3:6) in kerb size 100mm Thick x 75mm high including all necessary formwork	LM	18			
	<u>Cement and sand (1:3) screed as described in:-</u>					
B	32mm thick screed mixed with plasticiser and finished rough with wood float.	SM	595			
C	Ditto to sides and top of kerbs 250mm girth including fair edges and coved junction with floor finish.	LM	18			
D	20x100mm high skirting screed (a.b.d) with coved junction and rounded top edge	LM	1226			
	<u>Water proofed cement and sand (1:3) screed as described in:-</u>					
EF	40mm Thick in water room in roof space and balconies	SM	123			
	32mm thick backing finished to slope in wet areas to receive ceramic tiles	SM	38			
	<u>Non-slip ceramic tiles laid to regular pattern, bedding and jointing in cement / sand mortar (1:4), pointing in white cement</u>					
G	Ceramic floor tiles	SM	38			
	<u>330 x 330 x 8mm Thick coloured ceramic floor tiles laid on screed backing (m.s) and pointed in matching mortar to:-</u>					
HJ	Floors	SM	454			
	100 x 20mm skirting with rounded top.	LM	1226			
K	<u>CEILING FINISHES</u>					
	<u>Cement, lime and sand (1:2:9) plaster steel trowelled as described to:-</u>					
	15mm thick to horizontal soffits of ceiling	SM	595			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>FINISHES</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>FINISHES CONT'D</u>					
	<u>Prepare, apply one coat of emulsion under coat and two coats of vinylmatt paint as described to:-</u>					
A	Ceiling soffits	SM	595			
	<u>STAIRCASE, WALKWAY & LOBBY FINISHES</u>					
B	32mm thick cement sand screed 1:4 including 20 x 4mm thick plastic terrazzo strips to approved pattern to receive granolithic to landing	SM	16			
CD	Ditto to 270mm wide treads	LM	117			
	Walkway and lobby areas	SM	103			
E	<u>Unpolished granolithic paving as described in:-</u>					
FGH	Provide and lay 10mm thick unpolished granolithic laid on screed measured separately including polishing to complete with grinding, polishing and sealing and with an approved hardener to architect's specifications and approval	SM	16			
	Ditto to 250mm wide paving in treads	LM	117			
J	Ditto finish to 150mm high risers	LM	117			
K	Ditto finish to walkway and lobby areas	SM	103			
L	Ditto 100mm high skirting with coved junction and rounded top edge	LM	22			
	15mm Thick finish to outer string 380mm (maximum) high finished to profile treads and risers.	LM	22			
	20mm Thick finish wall string 250mm(maximum) high with rounded top raking edge and small coved junction to profile of treads and risers	LM	22			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>FINISHES</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>FINISHES CONT'D</u>					
A	Extra over paving for 50mm wide non-slip carboradum strip 1200mm long including cutting grove in screed and making good	NO	117			
B	30 x 3mm Thick plastic dividing strip	LM	117			
	<u>12mm thick cement sand (1:2:9) plaster to:-</u>					
CD	Slopping to soffites of staircase	SM	29			
	Horizontal soffites of landings	SM	16			
	<u>Prepare, apply one coat of emulsion under coat and two coats of vinylmutt paint as described to:-</u>					
EF						
	Plastered soffites of staircase	SM	29			
	Horizontal soffites of landings	SM	16			
	<u>CARRIED TO COLLECTION</u>					
				KSHS.		
	<u>COLLECTION</u>					
	Brought forward from page 8/19					
	Brought forward from page 8/20					
	Brought forward from page 8/21					
	Brought down from above					
	<u>TOTAL OF ELEMENT NO. 9 - FINISHES</u>					
	<u>CARRIED TO SUMMARY OF BILL NO 2</u>			KSHS.		
	<u>FINISHES</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<p><u>ELEMENT NO. 10</u></p> <p><u>PLUMBING AND DRAINAGE INSTALLATIONS ALL</u></p> <p><u>PROVISIONAL</u></p> <p>NOTE: The RATEs inserted should include for:- (1) Fixing complete with all necessary cutting and jointing along the running lengths, waste, shorts and supports. (ii) Forming chases, mortices holes in walls and concrete structure including making good surfaces.</p> <p><u>NOTE: TRADE NAMES</u></p> <p>Where Trade names are mentioned below, the tenderer MUST provide the same materials and other brands shall NOT be accepted without a written authority to supply alternative brands by the Engineer or the Architect.</p> <p><u>ALL ARE INTERNAL DIMENSIONS</u></p> <p><u>WATER SUPPLY TO ROOF TANKS AND OVERFLOWS</u></p> <p><u>Supply, delivery and install Chlorinated PolyVinyl Chloride (CPVC) Class 1 (SDR 11) solvent welded plumbing system as per ASTM D-2846, all traded as Astral CPVC PRO' for hot and cold water plumbing; Indicated diameters are internal (Nominal Bores)</u></p>					
ABC	25mm Diameter pipe in wall chase or under floor slab	LM	358			
DE	20mm Diameter pipe in wall chase or under floor slab	LM	187			
	25mm Diameter pipe in roof space	LM	120			
	20mm Diameter overflows	LM	40			
	15mm Diameter pipe (rising mains)	LM	733			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Extra over CPVC pipes for:-</u>					
ABC	15mm Diameter elbow	LM	100			
DEF	25mm Diameter elbows	NO	140			
GHJ	20mm Diameter elbow	NO	40			
	25mm Equal Tee	NO	20			
K	20mm unions	NO	200			
	20mm Female threaded Socket Adapter	NO	100			
LM	20mm Female threaded Socket Adapter	NO	100			
	25mm Female threaded Socket Adapter	NO	40			
N	15mm male threaded Adapter	NO	40			
	<u>Brass valves</u>					
	15mm (NB) Diameter high pressure screw down crutch head fullway gate valve with coupling and two red lead joints	NO	40			
P	20mm diameter Ditto	NO	20			
	25mm diameter Ditto	NO	20			
	<u>Water Tank</u>					
	Supply and install 1000 litres Cylindrical plastic water tanks heavy gauge plastic cold water storage tank size 1110mm dia x 1060mm high with lockable hinged covers including hoisting and fixing at roof level approximately 15 meters from ground level	NO	20			
	<u>Ball Valve</u>					
	Supply and fix 15mm(NB)Diameter medium pressure ball valve comprising of plastic ball and brass stem	NO	20			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Connections</u>					
A	25mm (NB) Diameter straight connections to heavy gauge plastic header tank with two back nuts and rubber washer including perforation to the tank	NO	20			
B	15mm Ditto	NO	20			
	<u>COLD WATER DISTRIBUTION</u>					
	<u>Distribution pipes to sanitary fitting</u>					
	<u>Supply, delivery and install Chlorinated PolyVinyl Chloride (CPVC) Class 1 (SDR 11)solvent welded plumbing system as per ASTM D-2846, all traded as Astral CPVC PRO' for hot and cold water plumbing; Indicated diameters are internal (Nominal Bores)</u>					
CDE	15mm Diameter pipe in wall chase	LM	95			
F	20mm Ditto	LM	187			
	25mm Ditto	LM	300			
GHJ	Ditto 25mm in roof space	LM	178			
KLM	<u>Extra over CPVC pipes for</u>					
N P	15mm Diameter bends	NO	100			
Q	20mm Diameter bends	NO	120			
	25mm Ditto	NO	4			
	20mm Equal Tee	NO	20			
	25mm Ditto	NO	4			
	25 x 20mm Diameter Reducer	NO	40			
	25 x 15mm Diameter Reducer	NO	200			
	20 x 15mm Diameter Reducing tee	NO	200			
	25mm union	NO	100			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>PLUMBING AND DRAINAGE</u>					

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ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>SANITARY FITTING</u>					
	<u>Supply and install the following sanitary fittings and accessories including all connections to services, wastes, jointing to supply,overflows pipes and all plugging and screwing to walls and floors.</u>					
	<u>Water closet</u>					
A	White vitreous china dual flush,close coupled W.C. suite comprising of closet "P" or "S" trap, 9 litres cistern with valveless fitting and plastic syphon, plastic flush bend, heavy duty plastic seat and cover; pan plugged and screwed to concrete floor and bedded in mastic and cistern fixed to walls To be as "Lecico" or equal and approved.	NO	20			
	<u>Water closet accessories</u>					
B	White vitreous china built in toilet roll holder size 205 x 150mm as "Ideal ceramics" or equal and approved.	NO	20			
C	15mm diameter flexible connectors, 300mm long complete with chrome plated angle valve including union jointing to steel tubing and the sanitary fittings.	NO	20			
	<u>Wash hand basin</u>					
D	White vitreous china wash hand basin size 350 x 445mm "Nova" complete with 1No.12mm chrome plated pillar tap "Vado" or equal and approved.	NO	20			
	<u>Wash hand basin accessories</u>					
E	32mm Diameter heavy duty plastic bottle trap complete 32mm chrome plated waste, plug, chain and stay; fixing steel brackets and all necessary accessories	NO	20			
F	15mm diameter flexible connectors, 300mm long complete with chrome plated angle valve including union jointing to steel tubing and the sanitary fittings.	NO	20			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Kitchen sink</u>					
A	Stainless steel heavy duty single bowl single drainer sink size 1000 x 500mm wide as manufactured by M/S Associated Steel LTD.for counter top mounting including setting opening in concrete slab	NO	20			
	<u>Kitchen sink accessories</u>					
B	40mm Diameter heavy duty plastic bottle trap as "Metro Plastics" or equal and approved.	NO	20			
C	40mm Diameter chrome plated heavy duty sink waste outlet complete with plug and chain.	NO	20			
D	15mm diameter kitchen sink bib taps for wall mounting as "peglar" or equal and approved.	NO	40			
	<u>Shower Fittings</u>					
E	450mm long chromium coated shower arm with end bend, threaded on both sides ready to receive instant shower heater	NO	20			
F	15mm diameter galvanised mild steel shower riser complete with bend and threaded ends for connection to the water supply pipe adapter to one end and shower arm to the other end	NO	20			
G	Shower bib tap complete with galvanised mild steel nipple Connection as "pegler" or other equal and approved	NO	20			
HJ	Ditto to dhobi area.	NO	20			
	Shower stop cork in chrome plated steel as "peglar" or other equal and approved	NO	20			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>PLUMBING AND DRAINAGE</u>					

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ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
ABC	100mm long radius bend	NO	60			
DEF	40mm Equal tee	NO	20			
GHJ	50mm diameter inspection tee complete with access cap	NO	20			
KLM	100mm diameter inspection tee complete with access cap	NO	20			
NP	50mm diameter plug	NO	20			
Q	100mm diameter Ditto.	NO	20			
	100mm Single branch	NO	20			
R	100mm diameter WC connectors40	NO	40			
	x 100mm boss connector	NO	20			
S	50 x 100mm boss connector	NO	60			
	40 x 32 mm reducer	NO	20			
T	50 x 40mm reducer	NO	20			
	100mm diameter weathering slate and apron	NO	8			
	100mm diameter vent cowls	NO	8			
	<u>Floor traps</u>					
	50 x 100mm diameter heavy duty gauge UPVC 4 way floor trap with plastic grating	NO	20			
	100mm diameter heavy duty gauge UPVC 4 way floor trap with plastic grating including connections to manhole	NO	20			
	100mm diameter gulley trap with painted mildsteel plate cover	NO	10			
	<u>Testing</u>					
	Allow for testing the whole of internal drainage works while in progress and on completion to the satisfaction of the Engineer and Local Authority (In No.20)		ITEM			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>INTERNAL PLUMBING AND FIRE FIGHTING</u>					
	<u>Water/CO2 portable fire extinguisher</u>					
A	9 litres water/Carbon dioxide gas portable fire extinguisher complete with nozzle, pressure gauge, initial charge and mounting brackets.	NO	5			
	<u>Carbon dioxide (CO2) gas portable fire extinguisher</u>					
B	5.0 Kg carbon dioxide gas portable fire extinguisher complete with nozzle, pressure gauge, initial charge and mounting brackets.	NO	5			
	<u>Fire blanket</u>					
C	Fire blanket made of cloth woven with fire proof material and measuring 1800x1210mm, and fitted with special tapes folded to offer instantaneous single action to release blanket from storing jacket. Manufactured to BS 1721.	NO	20			
	<u>Testing and commissioning</u>					
D	Allow for setting to work, testing, commissioning and labelling of the entire fire protection pipework, pumps and fittings to NFPA guidelines and to the satisfaction of the engineer.	ITEM				
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>PLUMBING AND DRAINAGE</u>					

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ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO.11 ELECTRICAL INSTALLATION</u>					
	<u>NOTES</u> <i>The electrical installation shall unless otherwise specified herein comply with the provisions of the latest edition and supplement rules and regulations published by the Institute of Electrical Engineers (I.E.E) and shall also be in accordance with the requirements of Kenya Power and Lighting Company Limited</i> <i>All the Electrical Installations Specialist's work should include RATEs for builder's work and making good , providing plugs for items and all necessary fittings and to be carried out by a licensed/registered electrician whose license and name shall be approved by the Engineer before his work starts on site.</i> <i>RATEs to include for forming chases, mortices, holes in walls and concrete structure and making good disturbed surfaces.</i>					
	<u>NOTE: TRADE NAMES</u> Where Trade names are mentioned below, the tenderer MUST provide the same materials or other equal and approved therefore other brands shall not be accepted without a written authority to supply alternative brands by the Engineer or the Architect.					
	<u>LIGHTING POINTS AND SWITCHES</u> <u>Supply, install, test and commission the following</u>					
A	Lighting points wired in 3 x 1.5mm ² PVC insulated single core cables (SC) copper in concealed 20mm diameter Heavy Gauge PVC conduits in walls and floors Ditto but two way.	NO	105			
B	<u>Supply and install the following lighting switches on recessed switch boxes 'SCHNEIDER ELECTRIC' or</u>	NO	25			
	<u>other equivalent</u>					
C	10A plate switch one gang one way as SCHNEIDER ELECTRIC Cat. No. GGBL1011	NO	105			
D	10A plate switch one gang Two way as SCHNEIDER ELECTRIC Cat. No. GGBL1012	NO	25			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>ELECTRICAL INSTALLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Supply and install the following lighting fittings</u>					
A	Ceiling rose pendant set complete with B22 Holder and energy saving lamps as MK Cat. No. 1149 WHI	NO	40			
B	Straight batten lamp holder complete with B22 Holder and energy saving lamps as MK Cat. No. 1154 WHI	NO	20			
C	IP44 Circular surface fixed luminaire with black polycarbonate base, opal diffuser and E27 LED lamp as MASSIVE CASABLANCA Cat No. 71416/01/30	NO	20			
D	1 x 15W 600mm Fluorescent shaver light with opal diffuser inline switch and lamp as MK Cat No. K811WHI	NO	20			
E	600mm long 8W, 800 lumen warm white LED fitting complete with control gear as Phillips Cat. No. BN016C LED8/CW L600GM	NO	20			
F	Circular surface-mount luminaire fitting with opal polycarbonate finish complete with E27 60W lamp holder as OMS Cat. No. OMS CAT PLAST 3 1x60W	NO	20			
G	320mm dia surface-mount 18W LED (>100lm/W) luminaire fitting with opal diffuser finish in staircase as LUCECO Cat. No. LBSR33W12S40	NO	20			
H	Oval-shaped weather proof LED bulkheaded rated 15W 1500 Lumens as PHILIPS Cat. No. WLOO8C LED 10/NW	NO	20			
J	86mmx86mm surface mounted simple-fit presence detector with PIR & passive photocell, rated 6A with adjustable ambient light & time delay as MK K5016WHI	NO	1			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>ELECTRICAL INSTALLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Supply and install the following lighting fittings</u>					
A	IP-65 photocell comprising UV-stabilized polycarbonate enclosure, filtered photodiode with negligible sensor drift, long life capacitors and NEMA socket bracket as Lucy Zodion Cat. No. Super 6	NO	1			
B	20A 240V 50Hz 4 poles AC 1 duty contactor in ample watertight enclosure as MK CAT No. 6420S	NO	1			
C	Non-maintained emergency lighting bulkhead with 11W PL-S lamp and 3 hours autonomy ("BROADWAY" range) as Tam-lite Cat. No. BRY11NM3	NO	1			
D	320mm diameter surface mount 18W LED (>80lm/W) luminaire with opal diffuser finish in staircase as LUCECO Cat No. LBSR33W12540	NO	20			
	<u>POWER POINTS AND OUTLETS</u>					
	<u>Supply and install the following power points to work complete with all necessary assesories</u>					
E	13 Amp twin socket outlet points wired as for a ring main in 3 x 2.5mm ² PVC SC copper cables drawn in 20mm dia. HG PVC conduits concealed in walls and floors complete with all accessories excluding the socket outlet plate	NO	120			
F	13 Amp single socket outlet points wired as for a radial in 3 x 2.5mm ² PVC SC copper cables drawn in 20mm dia. HG PVC conduits concealed in walls and floors complete with all accessories excluding the socket outlet plate	NO	1			
G	Ditto for watertight Single switched fused spur unit ditto	NO	5			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>ELECTRICAL INSTALLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>POWER POINTS AND OUTLETS</u>					
	<u>Supply and install the following power points to work complete with all necessary assesories</u>					
A	Cooker Circuit wired in 3 x 6mm ² PVC single core copper drawn in 20mm heavy gauge PVC conduits concealed in the walls and floors, one way switched with all accessories but excluding the cooker control unit.	NO	20			
B	Outlet for cooker connector unit comprising single box diameter conduits, wiring in 3 x 6.00mm ² SC PVC CU cables the cooker control unit and all accessories including cooker connector unit as MK	NO	20			
C	Instant Water Heater circuit wired in 3x4.00mm ² PVC SC copper Cables drawn in 20mm HG PVC conduits concealed in the walls and floors complete with all accessories and three meters of 4mm ² three core flex, but excluding the D.P. switch	NO	20			
D	Ditto but wired for Instant Water Heater with 3 x 4.00mm ² PVC SC in 25mm PVC conduit	NO	20			
E	20 AMP DP switch with neon light marked "Water Heater" as "SCHNEIDER" Cat. No. GGBL2014WH	NO	20			
F	Allow for conduiting & blanked out boxes for future pump installations in 32mm diameter HG PVC conduit (each 32metres) complete with blanking plate (3 No.)	ITEM	1			
G	Electric bell circuit wired in 3 x 1.50mm ² single core PVC copper cables drawn in 20mm HG PVC conduits complete with all accessories but excluding the bell chime and push	NO	20			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>ELECTRICAL INSTALLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
AB	Allow for engraving of switches - "Bell switch"	NO	20			
CD	Bell chime complete with 240/12 Volts transformer as "HONEYWELL/FRIEDLAND" Cat. No. D3126 FESTIVAL	NO	20			
E	10A Bell push one gang as "SCHNEIDER" Cat. No. GGBL1012RB	NO	20			
F	13A Weatherproof twin switched socket as "SCHNEIDER" Cat. No. LWP3010	NO	5			
G	13 Amps Twin switched sockets as "SCHNEIDER" Cat. No. GGBL30200	NO	120			
	45A D.P Cooker control unit switch with 13A switched socket outlet as "SCHNEIDER" Cat. No. GGBL4001	NO	20			
	Flush cooker connection unit as "SCHNEIDER" Cat. No. GGBL4050	NO	20			
H	<u>TELEPHONE & TELEVISION OUTLETS</u>					
	<u>Supply, install, test and commission:-</u>					
J	32mm Diameter H.G. PVC Conduits for linking the adaptable boxes concealed in the walls and floor with all accessories for Telephone and Television (T.V.)	LM	150			
KLM	38mm Diameter H.G. PVC Conduits for linking the adaptable boxes concealed in the walls and floor with all accessories for Power	LM	150			
N	Ditto but 50mm diameter from power manhole	LM	20			
P	Ditto but 100mm	LM	20			
	Telephone outlet point comprising of 20mm diameter floors	NO	40			
	Single TV/FM coaxial socket outlet as "SCHNEIDER" Cat. No. GGBL7081	NO	20			
	Single RJ45 telephone socket outlet "SCHNEIDER" Cat. No. GGBL7071C6	NO	40			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>ELECTRICAL INSTALLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	SUB MAINS AND DISTRIBUTION					
A	Supply and install 6-way consumer unit complete with 63A/30mA DP RCBO integral isolator for flush mounting and the following as Crabtree 32A; 2 No., 20A; 2 No., 10A; 1 No. with 1 No. blanking plate	NO	20			
B	Ditto but 4-way with the following MCB's as Crabtree, 20A; 2 No., 6A; 1 No. with 1 No. blanking plates	NO	1			
C	Carry out very concise permanent labelling for all the sub circuits in the board as before described (20 No.)	ITEM	1			
D	Sub-mains comprising of 3 x 16mm ² SC copper cables drawn in 38mm HG PVC conduits from the switchboard to the consumer unit as before described.	LM	600			
E	300 x 300 x 50mm 14 gauge galvanized iron sheet power draw box complete with cover	NO	20			
	<u>One off wall free standing lockable Main meter board, metal clad, cubicle pattern Type tested to KS IEC 61434-1, Form 2b IP44 comprising the following:-As per the Distribution Schematics TP MCCB 163A Incomer</u>					
F	Set of 1 No. 250A TPN bus bar Bus bar Chamber 25 No. 63A DP MCB out goers (16kA) Sufficient capacity for 25No.Sets of 3-phase KPLC's cut-outs, 25 No. KWH meters, 3 phase control, 3 phase meter Sufficient knock-outs for incoming/outgoing cables Sufficient capacity for 4-way consumer unit Type 2 Surge Protective device ((SPD) as Legrand or ABB Perspex viewing windows for the meters					
G	Allow for prepaid meter communication cable wired in 2 core cable and drawn in 25mm diameter PVC conduit	LM	500			
	<u>CARRIED TO COLLECTION</u>					
	<u>ELECTRICAL INSTALLATION</u>					
				KSHS.		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Supply and install the following as described:-</u>					
A	Supply and install Earthing for the above meter board, complete with Earthing Matt measuring 1.0 x 1.0m built in 25mm x 3mm thick riveted with copper rivets (Total length of copper tape required 20m). 2 No earth electrodes, and 2 No. Rod to tape clamps. The earth matt to be treated by charcoal and salt to obtain reading of < (less than) 1.0 ohms.	ITEM	1			
B	Supply and install 300mm x 300mm concrete earth inspection pit complete with heavy duty manhole covers.	NO	1			
C	Supply and install 1 x 16mm ² PVC/PVC Earth lead from Matt to Equipotential bars (2 No.)	LM	20			
DEF	PG cable glands for item above	NO	2			
	PG cable lugs for item above	NO	2			
G	Provide workshop drawings for Ground floor and typical floor	ITEM	1			
H	Provide record drawings for Ground floor and typical first floor	ITEM	1			
J	Kenya Power and Lighting Company Limited liaison and Attendance including initial application, documentation, follow-up, issuance of Completion Certificate and Test Reports.	ITEM	1			
	Testing, Commissioning and Hand over the entire Installation to the Electrical Engineer's Satisfaction.	ITEM	1			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>ELECTRICAL INSTALLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>LIGHTNING PROTECTION</u>					
A	Air termination Type Furse RA225 + RA600 fixed to ridge saddle Furse SD155 bolted to roof with water tight rubber washers	NO	3			
B	25mm x 3mm copper tape TC030 on tape clip Furse CP210 fixed at 750mm intervals to approved detail	LM	130			
C	50mm ² PVC insulated copper conductor enclosed in 25mm dia HG concealed PVC conduit between copper tape and re-bar down-conductor	LM	6			
D	Lugs for item C above including fixing bolts to roof conductors	NO	8			
EFG	Cable to tape square clamp as Furse	NO	4			
HJ	Rod to earth conductors clamps Furse CR520	NO	4			
	Test clamps Furse CN305	NO	4			
K	Rod to earth conductors clamps Furse CR520	NO	4			
L	Earth rods Furse RC015 with driving sud, furse ST015 and spike furse SP015 driven into ground	NO	4			
M	50mm ² ECC in 1 x 25mm dia PVC conduit between the test clamp and the earth rods	LM	4			
	125 x 100 x 50mm deep boxes with cover and marked safety earth installed columns to approved detail	NO	6			
	Concrete earthing inspection pits, Furse PT-005	NO	6			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>ELECTRICAL INSTALLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<p><u>The successful bidder shall engage a sub-contractor, duly licensed by Communications Authority of Kenya (CA) to carry out these installations</u></p> <p><u>All installations to BS and IEC standards</u></p> <p><u>TV WIRING INSTALLATIONS</u></p> <p><u>Supply, install, test, commission and maintain: -</u></p>					
A	TV outlet points wired in low loss coaxial cables drawn in existing HG concealed conduits cast in the floors and concealed in the walls complete with all other necessary accessories	NO	20			
BC	Dual outlet; TV/FM as "SCHNEIDER" Cat. No. GGBL7081	NO	20			
D	Digital terrestrial (free-to-air) antennae, amplifier and 2 way splitter as Televes	NO	1			
EF	Rust-protected aerial supports comprising steel pope, clamps, bolts etc	ITEM	1			
G	Satellite dish antennae as DSTV®	NO	1			
H	Quattro LNB (Low Noise Block) downconverter as Televes or ALCAD	NO	1			
	Rust-protected dish supports comprising arm, clamps, bolts etc	NO	1			
JKL	32-way multiswitch for collecting satellite and terrestrial TV signal and distributing to 32 outlets as ALCAD	NO	1			
M	Power supply unit with UK plug	NO	1			
	High voltage surge protector as Solatec	NO	1			
	Complete earthing of cabinet to IEE requirements comprising 2.5sq.mm ECC and accessories	ITEM	1			
	Lockable Rack with finish/colour to engineer's approval	ITEM	1			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>ELECTRICAL INSTALLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	ELECTRICAL INSTALLATIONS COLLECTION					
	Brought forward from page 8/34					
	Brought forward from page 8/35					
	Brought forward from page 8/36					
	Brought forward from page 8/37					
	Brought forward from page 8/38					
	Brought forward from page 8/39					
	Brought forward from page 8/40					
	Brought forward from page 8/41					
	Brought forward from page 8/42					
	TOTAL OF ELEMENT NO. 11 - ELECTRICAL INSTALLATION CARRIED TO SUMMARY OF BILL NO 2			KSHS.		
	ELECTRICAL INSTALLATION					

ITEM	DESCRIPTION			SHS.	CTS.
<div>20NO.ONE BEDROOM UNITS</div> <div>AHP HOMABAY HOUSING PROGRAMME SECTOR AHOMABAY</div> <div>COUNTY</div> <div>SUMMARY</div>					
	<div>ELEMENT NO.</div>	<div>DESCRIPTION</div>	<div>FROM PAGE</div>		
ABC	1	SUBSTRUCTURES	8/04		
DEF	2	CONCRETE IN SUPERSTRUCTURE	8/06		
GHJ	3	WALLING	8/08		
KL	4	ROOFING	8/09		
	5	DOORS	8/12		
	6	WINDOWS	8/14		
	7	JOINERY FITTINGS	8/17		
	8	BALUSTRADING	8/18		
	9	FINISHES	8/22		
	10	INTERNAL PLUMBING AND DRAINAGE	8/33		
	11	ELECTRICAL INSTALLATION	8/43		
<div>TOTAL FOR 1 NO. BLOCK OF 20 NO. UNITS</div>			<div>KSHS.</div>	<div>x</div>	
				2	
<div>MULTIPLY THE ABOVE TOTAL OF KSHS2</div> <div>FOR TWO BLOCKS OF ONE BEDROOM UNITS 20.No</div>					
<div>TOTAL AMOUNT OF SECTION NO. 8 - BILL NO.2</div> <div>BUILDING WORKS CARRIED TO GRAND SUMMARY</div>			<div>KSHS.</div>		

SECTION NINE BUILDER'S
WORKSTUDIO UNITS 1NO.
BLOCKS BILL NO. 4

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	ELEMENT NO. 1 SUBSTRUCTURES (ALL PROVISIONAL)					
	<u>EXCAVATIONS AND EARTHWORK</u>					
A	Allow for keeping the whole of the excavation free from all spring and running water by pumping or any other such means as may be necessary	ITEM				
B	Allow for maintaining and upholding the sides of excavations and keeping excavations clear of all fallen materials, rubbish etc	ITEM				
C	Excavate 200mm thick overstrip in vegetation and loose murrum to remove top vegetable soil commencing from existing ground level	SM	221			
D	Excavate to reduce levels not exceeding 1.50M deep. commencing from stripped level	CM	111			
E	Excavate foundation trenches not exceeding 1.50M commencing from reduced levels	CM	203			
F	Excavate pits for bases not exceeding 1.50M commencing from reduced levels	CM	12			
G	Extra over Excavation in any position for excavating in rock class 3	CM	16			
HJ	Ditto rock class 1	CM	33			
K	Return, fill in and well consolidate selected excavated material around foundations	CM	105			
	Remove all surplus excavated materials from site	CM	110			
	<u>CARRIED TO COLLECTION SUBSTRUCTURE</u>					
				KSHS.		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	(EXCAVATIONS AND EARTHWORK..... CONT'D)					
	<u>FILLING</u>					
A	Selected excavated material or other approved imported filling spread, levelled and consolidated in 150mm layers including ramming ground under	CM	216			
BC	300mm Thick hardcore filling ditto to receive floor slabs	SM	121			
	50mm Thick murram blinding well watered and rolled on top of hardcore	SM	121			
D	<u>Anti-termite treatment</u>					
	Treat the top surface of hardcore and excavated plinths with 'Premise 200 SC' or 'Mchwatox 350 SC' or any other equal and approved insecticide to be applied by a specialized firm as Insecta Ltd or Rentokil Ltd or any firm registered with Pest Management Association of Kenya (PEMAK). A printed Certificate of Guarantee for a period of 10 years to be provided before payment.	SM	151			
E	Level and compact bottoms of excavated foundations and bases as directed on site	SM	143			
FG	<u>Mass Concrete (1:4:8)as described in:-</u>					
	50mm Thick blinding under foundations	SM	135			
	Ditto to column bases	SM	8			
H J	<u>Vibrated reinforced concrete</u>					
K L	<u>Class 25/20 mix 1:11/2:3 in:-</u>					
M	Foundation footing	CM	34			
	Column bases	CM	3			
	Columns	CM	3			
	Ramp	CM	5			
	150mm Thick ground floor slab.	SM	151			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>SUBSTRUCTURE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>WALLING</u>					
	<u>Natural stone wall bedded and jointed in cement and sand (1:4) mortar in:-</u>					
A	200mm Thick selected approved quality natural stone (7N/mm ²) or other equal and approved block walling dressed :including double dressing to corner blocks:in cement and sand (1:3) mortar : 20 gauge x 25mm wide hoop iron in every alternate course: to	SM	301			
	<u>PLINTHS</u>					
	<u>Cement and sand (1:3) render as described in:-</u>					
B	13mm Thick with wood float finish to vertical surfaces	SM	25			
	<u>Prepare and apply three coats first grade plastic emulsion paint as described on:-</u>					
C	Vertical rendered surfaces	SM	25			
	<u>Precast concrete paving slabs</u>					
D	600 x 600 x 50mm Thick precast concrete paving slabs laid on and including 50mm Thick sand bed jointed and pointed in cement and sand (1:4) mortar	SM	42			
	<u>CARRIED TO COLLECTION</u>					
	<u>COLLECTION PAGE</u>					
	Brought forward from page 9/01					
	Brought forward from page 9/02					
	Brought forward from page 9/03					
	Brought down from above					
	<u>TOTAL ELEMENT NO 1 - SUBSTRUCTURE</u>					
	<u>CARRIED TO SUMMARY OF BILL NO2</u>					

[illegible]

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>REINFORCEMENT (ALL PROVISIONAL)</u> <u>Hot rolled,ribbed high yied mild steel reinforcement bars to approved standards including soft iron tying wire and concrete spacer blocks in:-</u>					
ABC	8mm Diameter	KG	9,522			
D	10mm Diameter	KG	6,042			
	12mm diameter	KG	6,308			
DEF	16mm diameter	KG	651			
GHJ	<u>Sawn formwork to:-</u>					
K L	Sides and soffits of beams	SM	678			
MN	Sides of columns	SM	342			
	Horizontal soffites of landing	SM	21			
	Slopping soffits of stairs	SM	41			
	Soffites of suspended slabs	SM	774			
	Edges of suspended slab 75 -150mm high	LM	416			
	Edges of landing 75 - 150mm high	LM	43			
	Edges of riser 75 - 150mm high	LM	126			
	Edges of suspended slab 150 -225 mm high	LM	124			
	Edges of staircase strings 400mm wide(extreme) including cutting to form profile of treads and risers	LM	59			
	<u>CARRIED TO COLLECTION</u>				KSHS.	
	<u>COLLECTION PAGE</u>					
	Brought forward from page 9/05					
	Brought down from above					
	<u>TOTAL OF ELEMENT NO.2 -CONCRETE IN SUPERSTRUCTURE</u>					
	<u>CARRIED TO SUMMARY OF BILL NO 2</u>				KSHS.	
	<u>CONCRETE IN SUPERSTRUCTURE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO. 4 ROOFING</u>					
A	20mm thick cement sand (1:4) laid to fall of screed with and including water proof additive to receive roofing felt	SM	190			
BC	Ditto to parapet walling 600mm high	LM	42			
	4mm thick modified bituminous as APP bituminous membrane torch bonded including priming surfaces with bituminous primer and dressing around surfaces					
D	Ditto to parapet walling	SM	190			
		LM	42			
EFG	<u>The Following Flat roof finishes fixed with approved adhesive</u>					
H	20mm thick interlocking Concrete tiles of size 225 x 225mm	SM	95			
	20mm thick Burnt Clay tiles of size 150 x 150mm	SM	95			
K	100mm diameter plastic fulbora outlet cast in concrete	NO	12			
	Triangle fillet size 25 x 25mm	LM	104			
	<u>Sundries</u>					
L M	Groove in walling for turn in waterproofing membrane	LM	104			
NP	<u>24 Gauge Prepainted galvanized iron in:-</u>					
	Ditto but for 90 degrees bends	NO	12			
	100 x 75mm Down pipe	LM	296			
Q	Extra over down pipe for sawnneck 600mm wide	NO	12			
	Ditto but shoe.	NO	12			
	<u>PAINTING AND DECORATION</u>					
	<u>Prepare and apply two coats of zinc chromate primer and one finishing coat of gloss oil paint as manufactured by Duracoat or other equal and approved paints as described on:-</u>					
	Metal surfaces 200 - 300 girth externally	LM	109			
	<u>TOTAL FOR ELEMENT NO. 4 - ROOFING</u>					
	<u>CARRIED TO SUMMARY OF BILL NO.2</u>					
				KSHS.		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO.5DOORS</u> <u>TAKE DELIVERY, STORE AND FIX IN PLACE</u> <u>EXTERNAL DOORS</u>					
	<u>TAKE DELIVERY the following purpose made steel small panels / panes casement doors with mild steel angle frame primed with zinc chromate or primed red oxide including building in lugs to jambs,plugging and screwing to head and sides and bedding frame in water proof cement mortar and pointing in approved mastic in:-</u>					
A	Steel grille double door overall size 1200x2400mm high in two (2) No. equal door leaves each of size 600 x 2400mm	NO	1			
B	Steel casement door overall size 900 x 2400mm high in standard door glazing sections consisting of fixed light top section size 900x300mm high and openable bottom section size 900x2100mm high with 900x300mm metal sheet at the bottom complete with necessary ironmonger,18No.small glazing obscure panes size 300x300mm fixed with putty to steel door.	NO	31			
	<u>INTERNAL DOORSFLUSH DOORS</u> <u>Supply and fix the following flush doors,</u>					
C	45mm Thick semi-solid core flush door size 725 x 2250mm high	NO	30			
	<u>FRAMES AND FINISHINGS</u> <u>supply and fix Wrot prime grade cypress in:-</u>					
G	100 x 50mm thick frame plugged to wall with rawl bolt and pelleted	LM	167			
H	<u>Metal Work</u> 150mm long x 50m wide x 3mm thick fish tailed wrot iron door cramps three times bent, one end screwed into frame and the other end built in walls	NO	378			
	<u>IRON MONGERY</u> <u>Supply and fix the following ironmongery complete with matching screws (Ref.is to UNION catalogue or other equal and approved)</u>					
JK	Pairs of 100mm brass butt hinges	PRS	30			
	100mm brass barrel bolts	NO	30			
	<u>CARRIED TO COLLECTION</u>					
	<u>DOORS</u>					
				KSHS.		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>PAINTING AND DECORATION</u>					
	<u>Prepare and apply one coat aluminium primer before fixing to:</u>					
A	Back of wood 0 - 100mm girth	LM	167			
	<u>Touch up primer, prepare and apply two undercoats and one finish coat enamel paint to metal work on:-</u>					
BC	Door surfaces generally	SM	140			
	Surfaces 100 - 200mm girth	LM	182			
	<u>Prepare, knot, prime, stop and apply two undercoats and one finishing coat gloss oil paint as described on wood work to:</u>					
DE	General surfaces	SM	108			
	Surfaces 200 - 300mm girth	LM	167			
	<u>CARRIED COLLECTION</u>			KSHS.		
	<u>COLLECTION</u>					
	Brought forward from page 9/09					
	Brought down from above					
	<u>TOTAL FOR ELEMENT NO. 5 - DOORS</u>			KSHS.		
	<u>CARRIED TO SUMMARY OF BILL NO. 2</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO. 6WINDOWS</u>					
	<u>Precast concrete (1:2:4) bedded and jointed in Cements and mortar (1:3) as described in</u>					
A	200x75mm weathered and throated window cill with smooth finish on all exposed surfaces	LM	138			
B	Splayed cutting to walls.	LM	138			
	<u>TAKE DELIVERY, STORE AND FIX IN PLACE</u>					
	<u>STEEL CASEMENT WINDOWS</u>					
	TAKE DELIVERY, STORE fix the following steel windows with 25mm zed and tee sections to approved sample with and including; 25x6mm burglar proofing flat bars behind all					
	open-able windows; splayed zed section anchors; brass handles and stays of approved pattern; two coats of red oxide primer before delivery to site; permanent vents to be provided to all windows with mosquito mesh reinforcement including cutting, pinning and building in lugs to jambs and pointing in cement and sand mortar					
	(1:3) as per schedules and Architect's approval					
C D	Window size 1500 x 1200mm high	NO	30			
E	Window size 1300 x 1500mm high	NO	30			
F	Window size 900 x 1500mm high	NO	20			
	<u>Metal Work</u>					
	150x40x3mm Thick fish-tailed holdfast screwed to back of frames and built into walling	NO	640			
G	<u>GLAZING</u>					
	5mm Thick clear sheet glass and glazing to steel panes in panes exceeding 0.50 square meters but not exceeding 1.00 square metres	SM	113			
H	<u>Obscure glass</u>					
	Ditto but obscure glass	SM	41			
	<u>Supply and fix the following heavy duty ironmongery complete with matching screws as "KENS METAL" or other equal and approved)</u>					
JK	Heavy duty brass window stays	NO	160			
	Heavy duty brass window fasteners	NO	160			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>WINDOWS</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>WINDOWS (CONT'D)</u>					
	<u>Burglar-proofing bars</u>					
A	50 x 25 x 4mm thick heavy guage mild steel rectangular hollow section tubes in framework and bars in burglar proofing grilles. Fabrication finished with red oxide primer with and including building into walls and making good	SM	154			
B	Apply three coats of gloss oil paint as specified to small diameter bars	SM	308			
	<u>Render, cement and sand (1:4), Steel trowelled</u>					
CD	15mm Thick cement sand(1:4)rendering to window reveal	SM	142			
	Ditto to window trim 50mm girth	LM	474			
	<u>Painting & Decoration</u>					
	<u>Prepare including and apply three coats of premium exterior quality silk vinyl paint Paints" or equal and approved to:-</u>					
EF	Window trim and surround 50mm wide	LM	474			
	Ditto Window reveal	SM	142			
GH	<u>Prepare, prime and apply two undercoats and one Finishing coat gloss oil paint on</u>					
	Metal surfaces externally	SM	154			
	Ditto but internally	SM	154			
	<u>CARRIED COLLECTION</u>			KSHS.		
	<u>COLLECTION</u>					
	Brought forward from page 9/11					
	Brought down from above					
	<u>TOTAL OF ELEMENT NO.6 - WINDOWS</u>			KSHS.		
	<u>CARRIED TO SUMMARY OF BILL NO. 2</u>					
	<u>WINDOWS</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<p><u>ELEMENT NO. 7</u></p> <p><u>JOINERY FITTINGS AND FIXTURES(ALL PROVISIONAL)</u></p> <p><u>NOTE: All blockboard, MDF boards,etc in joinery works shall be lipped with hardwood beading all round before fixing.</u></p> <p><u>High level cupboards</u></p> <p><u>The following in 30 No high level storage cupboard units 1500mm long x 600mm high x 300mm deep</u></p> <p><u>Prime grade cypress</u></p>					
A B	38 x 25mm thick bearer plugged.	LM	60			
C	Ditto pinned.	LM	30			
	20 x 20mm lipping pinned.	LM	60			
DEF	<u>25mm Thick blockboard</u>					
	Sides	SM	5			
G	Shelving	SM	15			
	Bottom	SM	15			
	<u>Prepare and apply one coat aluminium primer to:</u>					
H	Back of wood 0 - 100mm girth.	LM	60			
	<u>JOINERY CONT'D</u>					
	<u>Knot, prime, stop. Prepare, apply two undercoats and one finishing coat of first quality hard gloss oil paint on woodwork:-</u>					
J	General surfaces	SM	60			
	<u>Prepare, knot, prime and apply two undercoats and one finishing coat clear wax varnish on woodwork to:-</u>					
	Surfaces 0-100mm girth	LM	60			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>JOINERY FITTINGS</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Low level kitchen cupboards</u>					
	<u>The following in 30 No. low level kitchen cupboards</u>					
	<u>below concrete worktop total girth grouped together</u>					
	<u>1500mm long x 850mm high x 550mm deep</u>					
AB	100mm thick concrete (mix 1:3:6) plinth	SM	30			
	Sawn formwork to edge of concrete plinth					
C	75-150mm girth	LM	90			
	50 x 20mm thick fillet in forming rebate in concrete					
D	for door frame	LM	90			
	20mm thick cement & sand (1:3) screed trowelled smooth	SM	30			
E	<u>Worktop</u>					
	75mm thick concrete class 20 (1:2:4) in worktop					
	reinforced with BRC mesh No. A142 holed for					
	1400mm long x 500mm wide kitchen sink					
FG	(measured seperately)	SM	30			
	Sawn formwork to soffits of worktop	SM	30			
	Ditto to edges of worktop 75 - 150 mm girth	LM	90			
	<u>CARRIED COLLECTION</u>			KSHS.		
	<u>COLLECTION</u>					
	Brought forward from page 9/13					
	Brought down from above					
	<u>TOTAL FOR ELEMENT NO. 7 - JOINERY FITTINGS</u>			KSHS.		
	<u>CARRIED TO SUMMARY OF BILL NO. 2</u>					
	<u>JOINERY FITTINGS</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	ELEMENT NO. 8 BALUSTRADES (ALL PROVISIONAL)					
	<u>STAIRCASE AND BALCONY BALUSTRADING.</u> <u>The following in rolled hollow sections in staircase and walkways with one coat red oxide primer as described in:-</u>					
AB	50mm dia x 3mm Circular hollow section handrail welded	LM	120			
	50 x 25 x 3mm Balusters 1250mm long with one end welded on handrail and other grouted and built	NO	120			
CD	100mm into concrete					
	25 x 25 x 2mm middle rails welded to balusters	LM	360			
	20 x 20 x 2mm infill 750mm high with one end welded to middle rail and other hand rail	NO	120			
EFG						
HJK	<u>Extra over RHS tubes for:-</u>					
	50mm Bend	NO	40			
L	50mm Endcaps	NO	96			
	Splay cutting to 50 x 50 x 3mm tubes	NO	240			
	Formed bend to 50 x 50 x 3mm tubes	NO	64			
	Cranked bend to 50 x 50 x 3mm tubes	NO	96			
MN	Welded joints between RHS members	NO	960			
	<u>SUNDRIES</u>					
	Make hole in concrete or walling 125mm deep and built in end of 50 x 25 x 3mm balusters with cement grout	NO	120			
	<u>Touch up primer, prepare and apply two undercoats and one finishing coat gloss paint to:-</u>					
	Metal surfaces	SM	300			
	Ditto 100 -200mm girth	LM	120			
	<u>TOTAL FOR ELEMENT NO. 8 - BALUSTRADES CARRIED TO SUMMARY OF BILL NO. 2</u>					
	<u>BALUSTRADES</u>					
				KSHS.		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO. 9FINISHES</u>					
	<u>EXTERNAL FINISHES</u>					
	<u>Cement and sand (1:4)masonry or concrete render as described in:-</u>					
	13mm Thick with wood float to Parapet walls					
A B	Ditto to beams	SM	65			
C	Straight key pointing on machine cut stone walling with quoin teething at the edges	SM	242			
	<u>Prepare surfaces,apply three coats all weather low sheen paint as described on:-</u>	SM	686			
CD	Rendered vertical surfaces					
	Ditto to beams	SM	65			
	<u>INTERNAL WALL FINISHES</u>	SM	242			
E	<u>Gauged cement and sand(1:2:9) plaster in:-</u>					
	13mm Thick with steel float finish to vertical surfaces					
F	<u>Cement and sand (1:5) backing in:-</u>	SM	1955			
	12mm thick with approved plasticiser and screed anti fungal Treatment finish to receive tiles (measured separately)					
G	<u>Supply and fix glazed wall tiles bedded on cement sand (1:5) backing and pointed in white cement in:-</u>	SM	497			
	330 x 250 x 8mm thick tiles					
H	<u>Prepare and apply three coats of silk vinyl paint on:-</u>	SM	497			
	Plastered surfaces					
J	<u>Prepare,apply one coat of universal under coat and two coats of super gloss paint on:-</u>	SM	1404			
	Plastered surfaces					
		SM	551			
	<u>CARRIED TO COLLECTION</u>					
	<u>FINISHES</u>			KSHS.		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>FINISHES CONT'D</u>					
	<u>FLOOR FINISHES</u>					
	<u>Kerbs</u>					
A	Concrete(1.3:6) in kerb size 100mm Thick x 75mm high including all necessary formwork	LM	36			
	<u>Cement and sand (1:3) screed as described in:-</u>					
B	32mm thick screed mixed with plasticiser and finished smooth sm with steel float.	SM	544			
C	Ditto to sides and top of kerbs 250mm girth including fair edges and coved junction with floor finish.	LM	36			
D	20x100mm high skirting screed (a.b.d) with coved junction and rounded top edge	LM	370			
	<u>Water proofed cement and sand (1:3) screed as described in:-</u>					
E	32mm thick backing finished to slope in wet areas to receive ceramic tiles	SM	212			
	<u>Non-slip ceramic tiles laid to regular pattern, bedding and jointing in cement / sand mortar (1:4), pointing in white cement</u>					
F	Ceramic floor tiles	SM	212			
	<u>300 x 300 x 8mm Thick coloured ceramic floor tiles laid on screed backing (m.s) and pointed in matching mortar to:-</u>					
GH	Floors	SM	544			
	100 x 20mm skirting with rounded top.	LM	370			
	<u>CEILING FINISHES</u>					
J	<u>Cement and sand (1:4) render as described in:-</u>					
	13mm Thick with wood float to horizontal surfaces	SM	678			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>FINISHES</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>FINISHES CONT'D</u>					
	<u>Cement, lime and sand (1:2:9) plaster steel trowelled as described to:-</u>					
A	15mm thick to horizontal soffits of ceiling	SM	774			
	<u>Prepare, apply one coat of emulsion under coat and two coats of vinylmurt paint as described to:-</u>					
B	Ceiling soffits	SM	1,452			
	<u>STAIRCASE FINISHES</u>					
C	32mm thick cement sand screed 1:4 including 20 x 4mm thick plastic terrazzo strips to approved pattern to receive terrazzo	SM	21			
D	Ditto to 270mm wide treads	LM	126			
	<u>Polished Grey Terrazzo Finish</u>					
E	Provide and lay 10mm thick terrazzo laid on screed measured separately including polishing to smooth complete with grinding, polishing and sealing and with an approved hardener to architect's specifications and approval	SM	21			
F G	Ditto to 250mm wide terrazzo paving in treads	LM	126			
H	Ditto finish to 150mm high risers	LM	126			
J	Ditto 100mm high skirting with coved junction and rounded top edge	LM	59			
K	15mm Thick finish to outer string 380mm (maximum) high finished to profile treads and risers.	LM	59			
	20mm Thick finish wall string 250mm(maximum) high with rounded top raking edge and small coved junction to profile of treads and risers	LM	59			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>FINISHES</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>FINISHES CONT'D</u>					
A	Extra over paving for 50mm wide non-slip carboradum strip 1200mm long including cutting grove in screed and making good	NO	126			
B	30 x 3mm Thick plastic dividing strip	LM	126			
	<u>12mm thick cement sand (1:2:9) plaster to:-</u>					
CD	Slopping to soffites of staircase	SM	41			
	Horizontal soffites of landings	SM	21			
	<u>Prepare,apply one coat of emulsion under coat and two coats of vinylmutt paint as described to:-</u>					
EF						
	Plastered soffites of staircase	SM	41			
	Horizontal soffites of landings	SM	21			
	<u>CARRIED TO COLLECTION</u>					
				KSHS.		
	<u>COLLECTION</u>					
	Brought forward from page 9/16					
	Brought forward from page 9/17					
	Brought forward from page 9/18					
	Brought down from above					
	<u>TOTAL OF ELEMENT NO. 9 - FINISHES</u>					
	<u>CARRIED TO SUMMARY OF BILL NO 2</u>				KSHS.	
	<u>FINISHES</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<p><u>ELEMENT NO. 10</u></p> <p><u>PLUMBING AND DRAINAGE INSTALLATIONS ALL PROVISIONAL</u></p> <p>NOTE: The RATEs inserted should include for:- (1) Fixing complete with all necessary cutting and jointing along the running lengths, waste, shorts and supports. (ii) Forming chases, mortices holes in walls and concrete structure including making good surfaces.</p> <p><u>NOTE: TRADE NAMES</u></p> <p>Where Trade names are mentioned below, the tenderer MUST provide the same materials and other brands shall NOT be accepted without a written authority to supply alternative brands by the Engineer or the Architect.</p> <p><u>ALL ARE INTERNAL DIMENSIONS</u></p> <p><u>WATER SUPPLY TO ROOF TANKS AND OVERFLOWS</u></p> <p><u>Supply, delivery and install Chlorinated PolyVinyl Chloride (CPVC) solvent welded plumbing system as per ASTM D-1784, all traded as 'Astral CPVC PRO' for hot and cold water plumbing;</u> <u>Indicated diameters are internal (Nominal Bores)</u></p> <p>ABC 25mm Diameter pipe in wall chase or under floor slab LM 426</p> <p>DE 20mm Diameter pipe in wall chase or under floor slab LM 400</p> <p>25mm Diameter pipe in roof space LM 120</p> <p>F G 20mm Diameter overflows LM 120</p> <p>HJ 15mm Diameter pipe (rising mains) LM 480</p> <p><u>Extra over CPVC pipes for:-</u></p> <p>15mm Diameter elbow LM 100</p> <p>25mm Diameter elbows NO 140</p> <p>20mm Diameter elbow NO 40</p> <p>25mm Equal Tee NO 20</p> <p><u>CARRIED TO COLLECTION</u></p> <p><u>PLUMBING AND DRAINAGE</u></p>					
				KSHS.		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Extra over CPVC pipes for:-</u>					
ABC	20mm unions	NO	200			
DE	20mm Female threaded Socket Adapter	NO	100			
	20mm Female threaded Socket Adapter	NO	100			
FG	25mm Female threaded Socket Adapter	NO	40			
	15mm male threaded Adapter	NO	40			
HJ	<u>Brass valves</u>					
	15mm diameter non-return valve as Peglar	NO	60			
K	15mm (NB) Diameter high pressure screw down crutch head fullway gate valve with coupling and two red lead joints	NO	90			
	20mm diameter Ditto	NO	30			
	25mm diameter Ditto	NO	60			
L	<u>Water Tank</u>					
	Supply and install 1000 litres Cylindrical plastic water tanks heavy gauge plastic cold water storage tank size 1100mm dia x 1060mm high with lockable hinged covers					
M	including hoisting and fixing at roof level approximately 15 meters from ground level	NO	30			
	<u>Ball Valve</u>					
N	Supply and fix 15mm(NB)Diameter medium pressure ball valve comprising of plastic ball and brass stem	NO	30			
P	<u>Connections</u>					
	25mm (NB) Diameter straight connections to heavy gauge plastic header tank with two back nuts and rubber washer including perforation to the tank	NO	30			
	15mm Ditto	NO	30			
	<u>Sterilization</u>					
	Allow for sterilization of the entire plumbing system	ITEM				
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	COLD WATER DISTRIBUTION					
	Distribution pipes to sanitary fitting Supply, delivery and install Chlorinated PolyVinyl Chloride (CPVC) solvent welded plumbing system as per ASTM D-1784, all traded as 'Astral CPVC PRO' for hot and cold water plumbing <u>Indicated diameters are internal (Nominal Bores)</u>					
ABC	15mm Diameter pipe in wall chase	LM	225			
D	20mm Ditto	LM	100			
EFG	25mm Ditto	LM	216			
H J	Ditto 25mm in roof space	LM	75			
K L	<u>Extra over UPVC pipes for</u> 15mm Diameter bends	NO	300			
MN	20mm Diameter bends	NO	60			
P Q	25mm Ditto	NO	50			
R	20mm Equal Tee	NO	75			
S	25mm Ditto	NO	60			
T	25 x 20mm Diameter Reducer	NO	20			
	x 15mm Diameter Reducer	NO	100			
	20 x 15mm Diameter Reducing tee	NO	100			
	25mm union	NO	50			
	<u>Extra over UPVC pipes for</u> 15mm Diameter male adapter socket	NO	90			
	15mm Diameter female adapter socket	NO	90			
	25mm Diameter female adapter socket	NO	50			
	<u>Brass gate valves</u> 25mm (NB) Diameter low pressure Peglar screw down crutch head stop cork with coupling and two red lead joints	NO	60			
	<u>Connections</u> 25mm (NB) Diameter straight connections to heavy gauge plastic header tank with two back nuts and rubber washer including perforation to the tank	NO	60			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>SANITARY FITTING</u>					
	<u>Supply and install the following sanitary fittings and accessories including all connections to services, wastes, jointing to supply,overflows pipes and all plugging and screwing to walls and floors.</u>					
	<u>Water closet</u>					
A	White vitreous china dual flush,close coupled W.C. suite comprising of closet "P" or "S" trap, 9 litres cistern with valveless fitting and plastic syphon, plstic flush bend, heavy duty plastic seat and cover; pan plugged and screwed to concrete floor and bedded in mastic and cistern fixed to walls To be as "Lecico" or equal and approved.	NO	30			
	<u>Water closet accessories</u>					
B	White vitreous china built in toilet roll holder size 205 x 150mm as "Ideal ceramics" or equal and approved.	NO	30			
C	15mm diameter flexible connectors, 300mm long complete with chrome plated angle valve including union jointing to steel tubing and the sanitary fittings.	NO	30			
	<u>Wash hand basin</u>					
D	White vitreous china wash hand basin size 350 x 445mm "Nova" complete with1No.12mm chrome plated pillar tap "Vado" or equal and approved.	NO	30			
	<u>Wash hand basin accessories</u>					
E	32mm Diameter heavy duty plastic bottle trap complete 32mm chrome plated waste, plug, chain and stay; fixing steel brackets and all necessary accessories	NO	30			
F	15mm diameter flexible connectors, 300mm long complete with chrome plated angle valve including union jointing to steel tubing and the sanitary fittings.	NO	30			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Kitchen sink</u>					
A	Stainless steel heavy duty single bowl single drainer sink size 1000 x 500mm wide as manufactured by M/S Associated Steel LTD.for counter top mounting including setting opening in concrete slab	NO	30			
	<u>Kitchen sink accessories</u>					
B	40mm Diameter heavy duty plastic bottle trap as "Metro Plastics" or equal and approved.	NO	30			
C	40mm Diameter chrome plated heavy duty sink waste outlet complete with plug and chain.	NO	30			
D	15mm diameter kitchen sink mixer taps for wall mounting as "COBRA" or equal and approved.	NO	30			
E	450mm long chromium coated shower arm with end bend, threaded on both sides ready to receive instant shower heater	NO	30			
F	100mm diameter stainless steel shower rose with 15mm diameter threaded connection to shower head.	NO	30			
G	15mm diameter galvanised mild steel shower riser complete with bend and threaded ends for connection to the water supply pipe adapter to one end and shower arm to the other end	NO	30			
H	Shower bib tap complete with galvanised mild steel nipple Connection as "pegler" or other equal and approved	NO	30			
J	Shower stop cork in chrome plated steel as "Cobra" or other equal and approved	NO	30			
	<u>Mirror</u>					
K	610 x 457 x 6mm Thick Glass plate mirror as "Impala glass" or equal and approved fixed to wall with 4No. chrome plated dome capped screws and 5mm thick foam back rest.	NO	30			
	<u>Testing</u>					
L	Allow for pressure testing the whole of cold water supply while in progress and on completion to the satisfaction of the Engineer.		ITEM			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>INTERNAL DRAINAGE</u>					
	<u>Supply and install uPVC soil system to approved standards and MuPVC waste systems to with screwed and socketed joints to . Solvent welded joints fixed as manufacturer's written instructions.</u>					
ABC	32mm Diameter pipe UPVC grey in wall chase or floor slab	LM	75			
DE	40mm Ditto	LM	50			
	50mm Ditto	LM	150			
	100mm Ditto	LM	100			
F G	100mm Ditto but golden brown in floor slab and in	LM	75			
H J	trenches					
K L	<u>Extra over pipe for:-</u>					
M N	32mm Diameter bend	NO	100			
P Q	40mm Ditto	NO	60			
RST	50mm Ditto	NO	50			
U	100mm Ditto	NO	75			
	100mm long radius bend	NO	60			
	40mm Equal tee	NO	100			
	50mm diameter inspection tee complete with access cap	NO	100			
	100mm diameter inspection tee complete with access cap	NO	60			
	50mm diameter plug	NO	60			
	100mm diameter Ditto.	NO	120			
	100mm Single branch	NO	120			
	100mm diameter WC connectors40	NO	40			
	x 100mm boss connector	NO	60			
	50 x 100mm boss connector	NO	60			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Extra over pipe for:-</u>					
ABC	40 x 32 mm reducer	NO	80			
D	50 x 40mm reducer	NO	40			
	100mm diameter weathering slate and apron	NO	10			
E	100mm diameter vent cowls	NO	10			
F	<u>Floor traps</u>					
	50 x 100mm diameter heavy duty gauge UPVC 4 way floor trap with plastic grating	NO	120			
G	100mm diameter heavy duty gauge UPVC 4 way floor trap with plastic grating including connections to manhole	NO	8			
	100mm diameter gulley trap with painted mildsteel plate cover	NO	24			
H						
	<u>Testing</u>					
	Allow for testing the whole of internal drainage works while in progress and on completion to the satisfaction of the Engineer and Local Authority (In No.30)		ITEM			
J						
	<u>INTERNAL PLUMBING AND FIRE FIGHTING</u>					
	<u>Water/CO2 portable fire extinguisher</u>					
	9 litres water/Carbon dioxide gas portable fire extinguisher complete with nozzle, pressure gauge, initial charge and mounting brackets.	NO	5			
K						
	<u>Carbon dioxide (CO2) gas portable fire extinguisher</u>					
	5.0 Kg carbon dioxide gas portable fire extinguisher complete with nozzle, pressure gauge, initial charge and mounting brackets.	NO	5			
L						
	<u>Fire blanket</u>					
	Fire blanket made of cloth woven with fire proof material and measuring 1800x1210mm, and fitted with special tapes folded to offer instantaneous single action to release blanket from storing jacket. Manufactured to approved standards	NO	30			
M						
	<u>Testing and commissioning</u>					
	Allow for setting to work, testing, commissioning and labelling of the entire fire protection and fittings to NFPA guidelines and to the satisfaction of the engineer.	ITEM				
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>PLUMBING AND DRAINAGE</u>					

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ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO.11 ELECTRICAL INSTALLATION</u>					
	<u>NOTES</u> <i>The electrical installation shall unless otherwise specified herein comply with the provisions of the latest edition and supplement rules and regulations published by the Institute of Electrical Engineers (I.E.E) and shall also be in accordance with the requirements of Kenya Power and Lighting Company Limited</i> <i>All the Electrical Installations Specialist's work should include RATEs for builder's work and making good , providing plugs for items and all necessary fittings and to be carried out by a licensed/registered electrician whose license and name shall be approved by the Engineer before his work starts on site.</i> <i>RATEs to include for forming chases, mortices, holes in walls and concrete structure and making good disturbed surfaces.</i>					
	<u>NOTE: TRADE NAMES</u> Where Trade names are mentioned below, the tenderer MUST provide the same materials or other equal and approved therefore other brands shall not be accepted without a written authority to supply alternative brands by the Engineer or the Architect.					
	<u>LIGHTING POINTS AND SWITCHES</u> <u>Supply, install, test and commission the following</u>					
A	Lighting points wired in 3 x 1.5mm ² PVC insulated single core cables (SC) copper in concealed 20mm diameter Heavy Gauge PVC conduits in walls and floors	NO	150			
	Ditto but two way.					
B	<u>Supply and install the following lighting switches on recessed switch boxes 'Schneider Electric' or other equivalent</u>	NO	60			
	10A plate switch one gang one way Cat. No.GGBL1011					
C D	10A plate switch one gang Two way Cat.No. GGBL1012	NO	60			
EF	10A plate switch two gang two way Cat. No. GGBL1022	NO	75			
	10A intermediate switch as Cat. GGBL1014	NO	10			
		NO	10			
	<u>CARRIED TO COLLECTION</u>					
	<u>ELECTRICAL INSTALLATION</u>					
				KSHS.		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Supply and install the following lighting fittings</u>					
A	Ceiling rose pendant set complete with B22 Holder and energy saving lamps as MK Cat. No. 1149 WHI	NO	30			
B	IP44 Circular surface fixed luminaire with black polycarbonate base, opal diffuser and E27 LED lamp as MASSIVE CASABLANCA Cat No. 71416/01/30	NO	30			
C	Straight Batten lamp Holder complete with B22 holder and energy saving lamps as MK Cat. No. 1154WHI	NO	30			
D	600mm long 8W, 800 lumen warm white LED fitting complete with control gear as Phillips Cat. No. BN016C LED8/CW L600 GM	NO	30			
E	Circular surface-mount luminaire fitting with opal polycarbonate finish complete with E27 60W lamp holder as OMS Cat. No. OMS CAT PLAST 3 1x60W	NO	30			
F	86mmx86mm surface mounted simple-fit presence detector with PIR & passive photocell, rated 6A with adjustable ambient light & time delay as MK K5016WHI	NO	1			
G	Surface mounted simple-fit sensor with PIR & passive photocell, rated 6A with adjustable time delay as MK Cat. No. K5016	NO	1			
	<u>Supply and install the following lighting fittings</u>					
H	IP-65 photocell comprising UV-stabilized polycarbonate enclosure, filtered photodiode with negligible sensor drift, long life capacitors and NEMA socket bracket as Lucy Zodion Cat. No. Super 6	NO	1			
J	20A 240V 50Hz 4 poles AC 1 duty contactor in ample watertight enclosure as MK CAT No. 6420S	NO	1			
K	Oval-shaped weatherproof LED bulkhead rated 15W 1500lumens as philips Cat. No. WL008C LED10/NW	NO	10			
L	320mm diameter surface mount 18W LED (>100lm/W) luminaire with opal diffuser finish in staircase as LUCECO Cat No. LBSR33W12S40	NO	20			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>ELECTRICAL INSTALLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
<u>POWER POINTS AND OUTLETS</u>						
<u>Supply and install the following power points to work complete with all necessary asesories</u>						
A	13 Amp twin socket outlet points wired as for a ring main in 3 x 2.5mm ² PVC SC copper cables drawn in 20mm dia. HG PVC conduits concealed in walls and floors complete with all accessories excluding the socket outlet plate	NO	180			
B	13 Amp single socket outlet points wired as for a radial in 3 x 2.5mm ² PVC SC copper cables drawn in 20mm dia. HG PVC conduits concealed in walls and floors complete with all accessories excluding the socket outlet plate	NO	30			
CD	Ditto for watertight Twin switched fused spur unit ditto	NO	30			
E	Cooker Circuit wired in 3 x 6mm ² PVC single core copper drawn in 20mm heavy gauge PVC conduits concealed in the walls and floors, one way switched with all accessories but excluding the cooker control unit.	NO	30			
F	Outlet for cooker connector unit comprising single box 25mm diameter conduits, wiring in 3 x 6.00mm ² SC PVC CU cables the cooker control unit and all accessories including cooker connector unit as MK	NO	30			
G	Instant Water Heater circuit wired in 3x4.00mm ² PVC SC copper Cables drawn in 20mm HG PVC conduits concealed in the walls and floors complete with all accessories and three meters of 4mm ² three core flex, but excluding the D.P. switch	NO	30			
H	Ditto but wired for Instant Water Heater with 3 x 4.00mm ² PVC SC in 25mm PVC conduit	NO	30			
J	20 AMP DP switch with flex outlet in base neon light marked "Water Heater" as "SCNEIDER" Cat. No. GGBL2014WH	NO	30			
K	Allow for connection of water heater element with 3 x 2.50mm ² heat resistant cable (max meters)	LM	60			
L	Allow for conduiting & blanked out boxes for future pump installations in 32mm diameter HG PVC conduit (each 32metres) complete with blanking plate (3 No.)	ITEM	1			
	Electric bell circuit wired in 3 x 1.50mm ² single core PVC copper cables drawn in 20mm HG PVC conduits complete with all accessories but excluding the bell chime and push	NO	30			
<u>CARRIED TO COLLECTION</u>				KSHS.		
<u>ELECTRICAL INSTALLATION</u>						

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
AB	Allow for engraving of switches - "Bell switch"	NO	30			
C	Bell chime complete with 240/12 Volts transformer as "FRIEDLAND OAKLAND" Cat. No. D846 + D780S 8V/1A	NO	30			
D	10A one gang Bell push switch with a wide rocker as "SCHNEIDER ELECTRIC" Cat. No. GGBL1012RB	NO	30			
E	13A Single switched socket as "SCHNEIDER" Cat. No. GGBL3010D	NO	30			
F	13 Amps Twin switched sockets as "SCHNEIDER" Cat. No. GGBL3020D	NO	180			
G	45A D.P Cooker control unit switch with 13A switched socket outlet neon light as "SCHNEIDER" Cat. No. GGBL4001	NO	30			
	Flush cooker connection unit as "SCHNEIDER" Cat. No. GGBL4050	NO	30			
	<u>TELEPHONE & TELEVISION OUTLETS</u>					
H	<u>Supply, install, test and commission:-</u>					
J	32mm Diameter H.G. PVC Conduits for linking the adaptable boxes concealed in the walls and floor with all accessories for Telephone and Television (T.V.)	LM	150			
K L	38mm Diameter H.G. PVC Conduits for linking the adaptable boxes concealed in the walls and floor with all accessories for Power	LM	150			
M	Ditto but 50mm diameter from power manhole	LM	20			
N	Ditto but 100mm	LM	20			
P	Telephone outlet point comprising of 20mm diameter HG PVC conduits and draw wire, concealed in walls and floors	NO	30			
	TV/FM & satelite triplexer socket outlet (IEC male) as "SCHNEIDER" Cat. No. GGBL7081	NO	30			
	1 gang euro plate with module adapter and RJ11/RJ45 socket outlet as "SCHNEIDER" Cat. No. GGBL7071C6	NO	30			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>ELECTRICAL INSTALLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>SUB MAINS AND DISTRIBUTION</u>					
A	Supply and install 4-way RCBO consumer unit complete with 63A/30mA DP RCBO integral isolator for flush mounting and the following RCBO's as Crabtree 20A; 2 No., 6A; 1 No. with 1 No. blanking plates	NO	30			
B	Ditto but 4-way with the following MCB's as Crabtree, 20A; 2 No., 6A; 1 No. with 1 No. blanking plates	NO	1			
C	Carry out very concise permanent labelling for all the sub circuits in the board as before described (20 No.)	ITEM	1			
D	Sub-mains comprising of 3 x 16mm ² SC copper cables drawn in 38mm HG PVC conduits from the switchboard to the consumer unit as before described.	LM	600			
E	300 x 300 x 50mm 14 gauge galvanized iron sheet power draw box complete with cover	NO	30			
	<u>One off wall free standing lockable Main meter board, metal clad, cubicle pattern Type tested to KS IEC 61434-1, Form 2b IP44 comprising the following:-As per the Distribution Schematics TP MCCB 163A Incomer</u>					
F	Set of 1 No. 250A TPN bus bar Bus bar Chamber 25 No. 63A DP MCB out goers (16kA) Sufficient capacity for 25No.Sets of 3-phase KPLC's cut-outs, 25 No. KWH meters, 3 phase control, 3 phase meter Sufficient knock-outs for incoming/outgoing cables Sufficient capacity for 4-way consumer unit Type 2 Surge Protective device ((SPD) as Legrand or ABB Perspex viewing windows for the meters	NO	1			
G	Allow for prepaid meter communication cable wired in 2 core cable and drawn in 25mm diameter PVC conduit	LM	500			
	<u>CARRIED TO COLLECTION</u>					
	<u>ELECTRICAL INSTALLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Supply and install the following as described:-</u>					
A	Supply and install Earthing for the above meter board, complete with Earthing Matt measuring 1.0 x 1.0m built in 25mm x 3mm thick riveted with copper rivets (Total length of copper tape required 20m). 2 No earth electrodes, and 2 No. Rod to tape clamps. The earth matt to be treated by charcoal and salt to obtain reading of < (less than) 1.0 ohms.	ITEM	1			
B	Supply and install 300mm x 300mm concrete earth inspection pit complete with heavy duty manhole covers.	NO	1			
C	Supply and install 1 x 16mm² PVC/PVC Earth lead from Matt to Equipotential bars (2 No.)	LM	20			
DEF	PG cable glands for item above	NO	2			
G	PG cable lugs for item above	NO	2			
H	Provide workshop drawings for Ground floor and typical floor	ITEM	1			
J	Provide record drawings for Ground floor and typical first floor	ITEM	1			
K	Kenya Power and Lighting Company Limited liaison and Attendance including initial application, documentation, follow-up, issuance of Completion Certificate and Test Reports.	ITEM	1			
L	Testing, Commissioning and Hand over the entire Installation to the Electrical Engineer's Satisfaction.	ITEM	1			
<u>CARRIED TO COLLECTION</u>				KSHS.		
<u>ELECTRICAL INSTALLATION</u>						

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ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<p><u>The successful bidder shall engage a sub-contractor, duly licensed by Communications Authority of Kenya (CA) to carry out these installations</u></p> <p><u>All installations to BS and IEC standards</u></p> <p><u>TV WIRING INSTALLATIONS</u></p> <p><u>Supply, install, test, commission and maintain: -</u></p>					
A	TV outlet points wired in low loss coaxial cables drawn in existing HG concealed conduits cast in the floors and concealed in the walls complete with all other necessary accessories	NO	20			
BC	Dual outlet; TV/FM as MK CAT No.S3522 WHI	NO	20			
D	Digital terrestrial (free-to-air) antennae, amplifier and 2 way splitter as Televes	NO	1			
EF	Rust-protected aerial supports comprising steel pope, clamps, bolts etc	ITEM	1			
G	Satellite dish antennae as DSTV®	NO	1			
H	Quattro LNB (Low Noise Block) downconverter as Televes or ALCAD	NO	1			
	Rust-protected dish supports comprising arm, clamps, bolts etc	NO	1			
JKL	32-way multiswitch for collecting satellite and terrestrial TV signal and distributing to 32 outlets as ALCAD	NO	1			
M	Power supply unit with UK plug	NO	1			
	High voltage surge protector as Solatec	NO	1			
	Complete earthing of cabinet to IEE requirements comprising 2.5sq.mm ECC and accessories	ITEM	1			
	Lockable Rack with finish/colour to engineer's approval	ITEM	1			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>ELECTRICAL INSTALLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Supply, install, test, commission and maintain: - (RATES INCLUSIVE OF TAXES)</u>					
	<u>COMMON AREA SOLAR POWER SUPPLY</u>					
A	125W 12V monocrystalline solar panel with 25 years warranty as per IEC 61853 standards as U-bink , Sollatec or equal and approved	NO	6			
B	Aluminium mounting structure to support the above solar panel modules to appropriate tilt to approval	ITEM	1			
C	4 mm2 2 core PVC/PVC twin with earth copper cable from panels including interconnections	LM	20			
D	6mm2 2 core PVC/PVC twin with earth copper cable from combiner to inverter	LM	20			
EF	2.5mm2 2 core PVC/PVC twin with earth flat copper cable	LM	10			
GHJ	200Ah 12V deep cycle, maintenance free, Lead Acid solar battery as per IEC 61427 standards as Amaron Raja, Solarmax battery or equal and approved	NO	2			
	50mm2 2-core battery cable	LM	10			
	Lockable outdoor battery cabinet to house the batteries	ITEM	1			
K	850VA Hybrid inverter of 230VAC input voltage, 12VDC PV input, 12VDC battery voltage and 800Wp PV power as per EN 50524, 50530 standards with artificial intelligence to prioritize solar energy and					
L	lockable rack as Schneider, Homaya Hybrid 850VA or equal and approved	NO	1			
M	10mm2 PVC SWA PVC 2 core copper cable from mains consumer unit to the inverter including interconnections	LM	10			
N	Earthing comprising of earthing clamps and 6mm2 earth continuity cable	ITEM	1			
	Any other additional item necessary to complete the installation (State)	ITEM	1			
	Contingency (5%)	ITEM	1			
	<u>CARRIED TO COLLECTION</u>			KSHS.		
	<u>ELECTRICAL INSTALLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	ELECTRICAL INSTALLATIONSCOLLECTION					
	Brought forward from page 9/28					
	Brought forward from page 9/29					
	Brought forward from page 9/30					
	Brought forward from page 9/31					
	Brought forward from page 9/32					
	Brought forward from page 9/33					
	Brought forward from page 9/34					
	Brought forward from page 9/35					
	Brought forward from page 9/36					
	TOTAL OF ELEMENT NO. 11 - ELECTRICAL INSTALLATION CARRIED TO SUMMARY OF BILL NO 2			KSHS.		
	ELECTRICAL INSTALLATION					

ITEM	DESCRIPTION			SHS.	CTS.
ABC DEF GHJ KL	<div>30NO UNITS STUDIO UNITS PROPOSED CONSTRUCTION OF HOMABAY HOUSING PROJECT PHASE ONE SECTOR A -HOMABAY COUNTY SUMMARY</div>				
	ELEMENT NO.	DESCRIPTION	FROM PAGE		
	1	SUBSTRUCTURES	9/04		
	2	CONCRETE IN SUPERSTRUCTURE	9/06		
	3	WALLING	9/07		
	4	ROOFING	9/08		
	5	DOORS	9/10		
	6	WINDOWS	9/12		
	7	JOINERY FITTINGS	9/14		
	8	BALUSTRADING	9/15		
	9	FINISHES	9/19		
	10	INTERNAL PLUMBING AND DRAINAGE	9/27		
	11	ELECTRICAL INSTALLATION	9/37		
	TOTAL FOR 1 NO. BLOCK OF 30 NO. UNITS			KSHS.	
			x		
			1		
			KSHS.		
TOTAL AMOUNT OF SECTION NO. 9 - BILL NO.2 BUILDING WORKS CARRIED TO GRAND SUMMARY			KSHS.		

SECTION TEN EXTERNAL
WORKSBILL NO. 5

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO 1</u>					
	<u>SITE CLEARANCE AND LAND SCAPING</u>					
A	Clear site of all vegetation, shrubs and bushes and cart away debris (Approx 4200 SM)	ITEM				
	<u>TREES AND GRASS PLANTING</u>					
	<u>Supply,store in approved conditions, plant and maintain trees 1200 mm high including forming pit size 1200 x 1200 x 1200 mm deep, removing all exccavated materials and backfilling with cow manure and red soil (1:2) compacted in 300 mm layers and providing 2 No. 50mm diameter support poles and 2 No. rubber tie bands; -</u>					
BCD	Thika Palm tree	NO	30			
EF	Stacalina (bottle brush)	NO	10			
	Siphodhia	NO	10			
	Australia flame tree	NO	10			
	Alkaria Kukai tree	NO	10			
G	<u>Supply,store in approved conditions, plant and maintain Shrubs including forming pit size 1000 x 1000 x 1000mm deep, removing all excavated materials and backfilling with cow dung manure and red soil (1:2) compacted in 300 mm layers.</u>					
	Shrub of type to the Architects specifications and detail	NO	25			
H	<u>Supply,store in approved conditions, plant and grass and other approved ground cover at 150 mm centers both ways including digging soil 300 mm deep removing all roots and weeds and mixing cow dung manure and red soil (1;2) raking to fine tilth,fertilizing and all necessary preparations including tilling until well established</u>					
	Pemba grass or other approved with ground cover to Architect specifications and details planted at 50 mm centers both ways	SM	625			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>LANDSCAPING</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>CONCRETE BENCHES</u>					
A	1800mm long x 1200mm wide x 800mm high precast concrete bench consisting of 50mm thick reinforced concrete (1:2:4) back rest size 1800mm long x 500mm 1800mm long x 500mm wide ditto and 2No. 100mm thick bench stands 500mm long x 450mm high including setting in (1:3:6) concrete footings in ground and painting bench to approvals and all necessary excavations and disposals	NO	4			
	<u>BOLLARDS</u>					
	<u>Excavations and Earthworks</u>					
B	Excavate for pits in normal soils overall size 500mm deep x 300mm diameter, part backfill and surplus load and cart way from site	NO	10			
	<u>Concrete works</u>					
C	Mass concrete (1:3:6) in pits size 300mm diameter x 500mm deep	NO	10			
D	Ditto in 100mm diameter metal tubes, 1200mm high Overall	NO	10			
	<u>Metal Work</u>					
E	4mm thick x 100mm diameter x 1200mm high primed circular hollow section tubes, 300mm in ground	NO	10			
	<u>Paint Work</u>					
F	Prepare metal surfaces and apply one undercoat and two finishing coats of gloss oil paint as "crown" or equivalent	SM	3			
				Kshs		
	<u>COLLECTION</u>					
	Brought forward from page 10/01					
	Brought down from above					
	<u>TOTAL OF ELEMENT NO. 1 - SITE CLEARANCE AND LAND SCAPING CARRIED TO SUMMARY OF BILL NO. 4</u>			Kshs		
	<u>LANDSCAPING</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO. 2</u>					
	<u>ROAD, FOOTPATHS AND STORM WATER DRAINAGE</u>					
	<u>ROADS AND FOOTPATHS</u>					
	<u>Excavation and earthworks</u>					
A	Excavate oversite to reduce levels commencing at existing ground level but not exceeding 1.50M deep.	CM	334			
B	Load, wheel and deposit excavated materials in spoil heaps on site where directed.	CM	334			
C	Excavate selected materials from spoil heaps, load, wheel, fill, spread, water and well compacted to 100% M.D.D. (BS 1377) standard compaction.	CM	475			
D	Imported murrum filling compacted and laid to falls and cross falls in 300mm thick layers	CM	500			
EFG	Remove surplus excavated materials from site.	CM	334			
	<u>Extra over</u> excavations for excavating in rock class 1.	CM	8			
H	Ditto but in rock Class 3	CM	17			
	<u>Road surface Treatment</u>					
J	Grade bottoms of excavations to fall and cross falls including rolling and compacting to 100% M.D.D (BS 1377) standard compaction.	SM	1668			
K	Treat the top surface of hardcore and excavated plinths with approved weed killer. Certificate or guarantee to be provided on completion of the treatment.	SM	1668			
	<u>Road Formation</u>					
L	150mm thick approved gravel sub grade well watered and compacted to 95% M.D.D standard compaction.	SM	1668			
	150mm thick hand packed stone base course well compacted to 95% M.D.D. standard compaction and blinded with approved fine material (Murrum, sand or stone dust) 25mm thick and finished to falls, cross falls	SM	1668			
M	and chambers to receive premise surfacing (M.S)					
	<u>Road Surface Finish</u>					
	60mm Thick medium duty concrete paving blocks laid on and including 50mm thick sand bed	SM	1668			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>ROAD, FOOTPATHS AND STORM WATER DRAINAGE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
A	Paint white road enamel 100mm wide on surface of road or car park.	LM	800			
	<u>Road kerbs and Channels:</u>					
B	Combined precast concrete (Grade 20) kerb type "A" to BS 340 size 125x255mm and channel size 125 x 100mm 125 x 100mm finished fair on all exposed surfaces with kerb having one rounded and chambered edge, bedded, jointed and pointed in cement and sand mortar (1:3) laid on and including 580 x 100mm plain concrete Grade "C" (mix 1:3:6 - 40mm) foundation haunched up on both sides including all necessary excavations and formwork.	LM	165			
CD	Ditto but curved on plan to various mean radius	LM	46			
	255mm wide x 125mm high road channel laid on and 300 x 100 including 200 x 100mm plain concrete (1:3:6 - 40mm) foundation haunched up on one side including excavations and formwork.	LM	150			
E F	Ditto but curved on plan to various mean radius	LM	23			
G	Standard 250 x 450mm precast concrete quadrant.	NO	2			
	<u>Foot paths and shoulders</u>					
H	Treat the top surface of hardcore and excavated plinths with approved weed killer to be applied by approved specialist firm (abd). Certificate of guarantee to be provided on completion of the treatment.	SM	165			
J	100mm thick bed of approved quality gravel filling well watered and compacted to 95% M.D.D std compaction and laid to falls and cross-falls	SM	165			
K	150mm thick bed of approved quality gravel filling well watered and compacted to 95% M.D.D std. compacted and laid to falls and cross-falls blinded with and including 25mm thick bed of fine material (murrum,sand/stone dust).	SM	165			
	50mm thick precast concrete Grade "B" (mix 1:2:4 - 12mm) paving slabs size 600 x 600mm on, and including 50mm thick bed of sand and spot bedded, jointed and pointed in cement and sand mortar (1:3)	SM	165			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>ROAD, FOOTPATHS AND STORM WATER DRAINAGE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
A	Selected natural stone pitching laid with cement and sand (1:3) mortar and including 100 mm compacted murrum base to Architect's approval.	SM	20			
	<u>STORM WATER DRAINAGE</u>					
	<u>Invert Block Drains</u>					
	<u>Excavate, part backfill, and remove surplus spoil from site, plank and strut sides of excavation including removing fallen materials and keeping excavation free from all water, grading and compacting bottom of excavations to falls</u>					
B	Channel 1200mm wide at top and 500mm wide at bottom and average 700mm deep	LM	43			
CD	Extra over excavation for excavating in rock class 3	CM	4			
	Ditto class 1	CM	2			
E	<u>Precast concrete units; mix 1:2:4 (12mm aggregates) vibrated: jointed and pointed in cement mortar (1:3)</u> 300mm Diameter x 100mm thick half round Pre-Cast concrete mix (1:2:4) invert drain blocks with splayed edges linked with and including two courses on either sides of 600 x 355 x 50mm thick Precast paving slabs bedded and jointed in cement and sand mix (1:3) mortar laid to slope on 50mm thick mass concrete (1:4:8) on 75mm thick murrum base	LM	43			
F	<u>Connection</u> Break existing lined storm water drains and make connection of new storm water drains to existing (4NO.)	ITEM				
G	<u>Headwalls</u> Construct pair of headwalls for 450mm diameter culvert in 200mm thick reinforced concrete class 20/20 1:2:4 walling including fair face finish to both sides, similar concrete in foundations complete with all necessary excavation, formwork, Reinforcements etc.	NO	2			
H	<u>Excavations</u> Excavate trench in normal soils for 450mm diameter drain pipe not exceeding 1.50m deep avg depth of 750mm deep part return fill in ram and remainder cart away from site	LM	16			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>ROADS AND STORM WATER DRAINAGE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
A	<u>Precast Concrete Works</u> 450mm Diameter precast concrete pipe bedded and jointed in cement sand (1:4) in trench.	LM	16			
B	<u>Gulley Chambers</u> Precast concrete Gulley chamber size 900x900x 600mm average in 100mm thickwalls on 100mm thick concrete (1:3:6) bed complete with 40mm thick combined cast iron and concrete grating cover size 356 x405 mm including all excavations and disposals	NO	1			
C	<u>Haunching and Surrounds</u> Plain in-situ vibrated concrete (1:3:6) 25mm aggregate in Bed and surround type 'C' to 450mm diameter culvert	LM	16			
D	<u>Red Soil</u> Imported red soil compacted to 150mm thick bottom bed and sides of excavated trenches.	CM	2			
E	<u>Shallow drain</u> <u>Precast concrete units; mix 1:2:4 (12mm aggregates) vibrated: jointed and pointed in cement mortar (1:3)</u> 600x750x150mm thick shallow inverted block drain Precast concrete mix (1:2:4) bedded and jointed in cement and sand mix (1:3) mortar laid to slope on 50mm thick mass concrete (1:4:8) on 75mmthick murram base	LM	160			
F	Allow for testing the Storm water drainage to approvals	ITEM				
G	<u>Mild Steel Grating</u> 500mm wide(approx) mild steel grating in 150mm long bays to VRC storm storm water drains comprising 50x6mm thick flat bar frame all round at 40mm centres wuth and including drilling holes in bars to receive 16mm diameter ribbed bars welded in centre of grating laid on 50x50x6mm thick angle line frame built into drain walls complete with one coat red oxide primer pre-delivery to site and 3 coats gloss paint.	LM	10			
				Kshs		
	<u>COLLECTION</u> Brought forward from page 10/03 Brought forward from page 10/04 Brought forward from page 10/05 Brought down from above					
	<u>TOTAL OF ELEMENT NO.2 - ROADS AND STORM WATER DRAINAGE CARRIED TO SUMMARY OF BILL NO. 4</u> <u>ROADS AND STORM WATER DRAINAGE</u>			Kshs		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO. 3</u>					
	<u>WATER RETICULATION</u>					
	General Notes:					
	1. Pipework rates shall include for nipples, couplings, elbows etc and all jointing materials.					
	Keeping excavations free from general water shall be deemed to be included in the rates as no separate provision has been made in the Bills.					
	Similarly upholding sides of excavated trenches shall be deemed to be included in the rates.					
	<u>Excavate trenches, part backfill and compact and remove surplus spoil from site, grade and compact bottom including plunking and strutting sides</u>					
A	Excavate for small pipe not exceeding 1.50m deep, part return fill and ram and remainder cart away.	LM	609			
	<u>Supply and install High-Density Polyethylene (HDPE) PN 16 for cold water plumbing pipes internal diameter to-:</u>					
BCD	15mm Diameter pipe in trench - County water supply	LM	30			
EFG	32mm Diameter pipe in trench - County water supply	LM	246			
	40mm Diameter pipe in trench - County water supply	LM	98			
	50mm Diameter pipe in trench - County water supply	LM	64			
	65mm Diameter pipe in trench - County water supply	LM	50			
	75mm Diameter pipe in trench - County water supply	LM	121			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>WATER RETICULATION</u>					

EXTERNAL WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Extra over pipes for</u>					
AB C	15mm Diameter bends	NO	2			
DE F	32mm Diameter bends	NO	16			
G H J	40mm Ditto	NO	2			
K L M	50mm Ditto	NO	2			
NP Q	65mm Ditto	NO	8			
RS T	75mm Ditto	NO	4			
U V	15mm Equal HDPE Tee	NO	4			
W X	32mm ditto	NO	40			
	65mm ditto	NO	4			
	40 x 40 x 32mm Tee	NO	6			
Z	50 x 50 x 32mm Tee	NO	4			
	50 x 50 x 40mm Tee	NO	6			
	75 x 75 x 65mm Tee	NO	6			
	90 x 15mm reducers	NO	2			
	90 x 50mm ditto	NO	10			
	90 x 65mm ditto	NO	4			
	15mm diameter HDPE male threaded adapters	NO	14			
	32mm ditto	NO	30			
	50mm ditto	NO	22			
	65mm ditto	NO	24			
	75mm ditto	NO	20			
	50mm end plug	NO	2			
	<u>Heave duty golden brown series UPVC pipe sleeves</u>					
	<u>fixed inaccordance with manufacturer printed</u>					
	<u>instructions:-</u>					
	100mm Diameter pipe in trench	LM	104			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>WATER RETICLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Valves</u>					
	<u>Supply and fix the following brass fittings as Manufactured by "KENT", "PEGLER" or other equal and approved Manufacturer complete with flanged bolted connectors in:</u>					
A	15mm Diameter high pressure screw down crutch head fullway gate valve as pegler with coupling and red lead joints	NO	1			
BCD	50mm ditto	NO	5			
	50mm Diameter ditto (wash out)	NO	1			
E F	65mm diameter fire hydrant of instantaneous coupling stand post type,complete with 1.0m high G.I stand post, wheel head, rubber plug,chain and chain stay.The stand post to be spray painted in red to match the hydrant valve.	NO	2			
	75mm Diameter gate valve.	NO	4			
	90mm Diameter sluice valve.	NO	1			
G H J	<u>Standard precast concrete marker (or indicator) post overall size 1150mm long x 75mm thick x 200mm wide at top x 100mm wide at bottom:</u>					
KL	<u>set in andincluding 300 x 400 x 300mm deep concrete 1:3:6 base including excavations and disposals, painting, inscription lettering etc.</u>					
	Gate Valve painted with inscription "G.V" lettering	NO	4			
	Ditto marked "W.O"	NO	1			
	Ditto marked "F.H"	NO	2			
	Ditto marked "S.V"	NO	1			
	Ditto marked "W.L"	NO	1			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>WATER RETICLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
A	<u>Stand pipe</u> 15mm diameter G.I stand pipe complete with lockable tap made from brass	NO	1			
B	<u>Valve Chambers</u> Valve chamber pit size 750x700x600mm deep (Internal dimensions) comprising of 100mm thick mass concrete 1:3:6 base; 100mm thick masonry,complete with lockable 2mm thick mild steel sheet hinged on fixed angle iron frames,painted in black super gloss paint,complete with necessary steel stiffeners and meter viewing area.	NO	4			
C	1000 x 1100 x 100mm thick precast concrete valve chamber cover reinforced with 10mm diameter steel bars spaced at 150mm centres both ways with smooth finish to top and all edges and with lifting handle.(S.V)	NO	4			
DE	Ditto to (W.O) Allow for connecting 90mm internal diameter HDPE PN 16 water pipe to the existing mains including all excavations, fittings, accessories, backfilling and payment of related charges in connection therewith all to the satisfaction of the Project Manager/Engineer and the County Engineer. (in 2No different positions).	NO	1			
F	<u>TESTING & STERILIZING</u> Allow for testing the whole of the water reticulation during the progress of the works and again on completion including sterilizing the entire pipe work as before described and leave the whole system in perfect working order to the satisfaction of the Project Engineer	ITEM				
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>COLLECTION PAGE</u> Brought forward from page 10/07 Brought forward from page 10/08 Brought forward from page 10/09 Brought down from above					
	<u>TOTAL OF ELEMENT NO. 3 - WATER RETICLATION</u> <u>CARRIED TO SUMMARY OF BILL NO.4</u>			Kshs		
	<u>WATER RETICLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO. 4</u>					
	<u>FOUL WATER DRAINAGE</u>					
	<u>Excavate trenches, part backfill and compact and remove surplus spoil from site, grade and compact bottom including plunking and strutting sides</u>					
A	For 100mm Diameter pipe in black cotton soil or other unsuitable material not exceeding 1.50M deep average 750mm deep.	LM	76			
B C G	Ditto 1000mm deep ditto.	LM	63			
HJ K	Ditto 1250mm deep ditto.	LM	40			
LM N	Ditto for 150mm diameter pipe 1000mm deep	LM	18			
PQR	Ditto 1250mm deep ditto	LM	17			
ST	Ditto 1500mm deep ditto	LM	15			
	Ditto for 200mm diameter pipe 1000mm deep	LM	54			
	Ditto 1250mm deep ditto	LM	48			
	Ditto 1500mm deep ditto	LM	30			
	Ditto for 300mm diameter pipe 1000mm deep	LM	4			
	Ditto 1250mm deep ditto	LM	3			
	Ditto 1500mm deep ditto	LM	3			
	Ditto exceeding 1.50M but not exceeding 3.0M deep ditto average 1750mm deep ditto.	LM	2			
	Extra over excavations for excavation in rock Class 3.	CM	15			
	Ditto Class 1.	CM	3			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>FOUL WATER DRAINAGE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Heavy duty golden brown series UPVC soil pipes and fittings including fixing in accordance with manufacturer printed instructions:-</u>					
A B C	100mm diameter pipe laid in trench	LM	117			
D E F	150mm Ditto	LM	42			
GH	200mm Ditto	LM	132			
	300mm Ditto	LM	12			
J	<u>Plain insitu vibrated concrete 1:3:6 in:</u>					
	Concrete bed and surround type 'C' to 100mm diameter pipe.	LM	117			
KLM	Ditto to 150mm diameter pipe.	LM	42			
	Ditto to 200mm diameter pipe.	LM	132			
N	Ditto to 300mm diameter pipe.	LM	12			
	<u>Imported filling</u>					
	Imported red soil well consolidated in bedding and surround to laid pipes in trench.	CM	36			
	Make hole in new manholes and build in end of 150mm dia pipe.	NO	2			
	Ditto 200mm diameter pipe.	NO	36			
	Ditto 300mm diameter pipe.	NO	2			
	<u>Gulley trap</u>					
P	100mm key terrain gulley "P" trap with 100mm diameter inlet and outlet including 100mm Thick concrete(1:3:6) bottom sidesand kerbs dished and trowelled smooth in cementsand(1:3)complete with 150 x 150 x 6mm Thick mild steel cover plate including all necessary excavation	NO	60			
	<u>Standard rectangular inspection chambers consisting of 100mm concrete(1:3:6) bed and 250mm benching; 150mm concrete(1:2:4) cover slab reinforced with and including 12mm diameter mild steel bars at 150mm centres both ways including forming opening for 600 x 450mm manhole cover; 150mm dressed stone walls in cement sand(1:3) mortar 12mm Thick water proofed cement sand (1:3) rendering internally; 600 x 450mm medium duty cast iron cover and frame;holes for large and extra large pipes; 12mm Thick cement sand(1:4) render to cover slabs and exposed wall surfaces;excavations and disposal from site including formwork:-</u>					
	800 x 450 x 500mm deep	NO	10			
	<u>CARRIED TO COLLECTION</u>					
	<u>FOUL WATER DRAINAGE</u>					
				Kshs		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Standard Rectangular Inspection Chambers cont'd</u>					
AB	800 x 450 x 750 deep	NO	5			
	800 x 600 x 1000mm deep	NO	5			
CD	800 x 600 x 1250mm deep	NO	5			
E	800 x 600 x 1750mm deep	NO	5			
	800 x 600 x 2000mm deep	NO	5			
F	<u>Circular/Ring Manholes</u>					
	Excavate for circular/ring manholes 1000mm deep, provide all necessary materials and construct circular ring manhole consisting of 50mm thick shaft rings 1070mm internal diameter and 100mm thick vibrated reinforced concrete (1:2:4) cover around the rings including steel reinforcement and formwork, maximum 1000mm deep to invert including heavy duty triangular cast iron manhole cover and frame 40 B.S 497 set in 100 thick precast concrete cover slab reinforced with 10mm diameter steel bars spaced at 150mm centres both ways, 150mm thick concrete (1:3:6) base, benching, rendering, forming holes, complete with backfill and carting away surplus excavated material.	NO	5			
G H J		NO	4			
KLM	Ditto 1250mm deep ditto.	NO	4			
	Ditto 1500mm deep ditto.	NO	5			
	Ditto 1750mm deep ditto.	NO	4			
	Ditto 2000mm deep ditto.	NO	3			
	Cast iron step irons built into sides of ring manholes.	NO	12			
	<u>Testing</u>					
	Allow for testing the whole drainage works while in progress and on completion to the satisfaction of the Engineer and County Government.		ITEM			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>COLLECTION PAGE</u>					
	Brought forward from page 10/11					
	Brought forward from page 10/12					
	Brought down from above					
	<u>TOTAL OF ELEMENT NO. 4 - FOUL WATER DRAINAGE</u>					
	<u>CARRIED TO SUMMARY OF BILL NO.4</u>			Kshs		
	<u>FOUL WATER DRAINAGE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO. 5</u>					
	<u>SOLAR STREET LIGHTING</u>					
	<u>Excavations and Disposals</u>					
A	Excavate for pit size 600 x 600mm not exceeding 1.50m deep starting from natural ground level part backfill and remainder cart away	6	NO			
	<u>Supply ,Install, test, commission and maintain: -</u>					
B	7 metres single arm street lighting column made from class "B" steel hot- dipped galvanized pipe to BS EN 40 to approval, for single side entry suitable for mounting solar street light (Item C below) The column to be erected in a concrete base of 600 x 600 x 1000mm	6	NO			
C	Ditto with double arm	2	NO			
	<u>SOLAR STREET LIGHTING</u>					
D	IP65 rated integrated solar street lighting luminaire as LEADSUN or approved equivalent, comprising of 20W, 2400 lumen LED lamp with a bat wing optical distribution (IES LM-79- 08), monocrystalline solar panel conforming to IEC 61701, IEC 61215 and IEC 61730 standards, lithium iron phosphate (LiFeP04) battery and maximum power point tracking (MPPT) charge controller. The LED modules shall be manufactured by either CREE, Osram, Samsung or Philips and the system shall have a system efficacy of atleast 130 lm/W. LED modules shall have rated life of atleast 50,000 hours in accordance to IES LM- 80-O8. The control sytem shall incorporate Transient Voltage Suppression device (TVS), built-in motion detection and lux level sensor. The system shall provide atleast 2-day autonomy during over-cast weather. All components shall conform to relevant IEC standards and the luminaire shall conform 10 IEC 60598-1:2014 standard for LED luminaires (Attach certificates of conformity)	6	NO			
E	Side arm IP65 rated integrated solar street lighting luminaire as LEADSUN or approved equivalent, comprising of 20W, 2400 lumen LED lamp with a bat wing optical distribution (IES LM-79- 08),	2	NO			
	<u>TOTAL OF ELEMENT NO. 5 - STREET LIGHTING</u>					
	<u>CARRIED TO SUMMARY OF BILL NO.4</u>					
	<u>SOLAR STREET LIGHTING</u>					
				Kshs		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>solar street lighting cont'd</u>					
A	IP44 post top luminaire aluminium and glass finish with transparent cover,40W LED lamp of (50821m)	2	NO			
B	Provide as-built record drawings for street/area lighting	ITEM				
C	Kenya Power and Lighting Company Limited liaison and Attendance including initial application, documentation, follow-up, issuance of Completion Certificate and Test Reports.	ITEM				
D	Testing, Commissioning and Hand over the entire Installation to the Project manager/Electrical Engineer's Satisfaction.	ITEM				
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>COLLECTION PAGE</u>					
	Brought forward from page 10/14					
	Brought down from above					
	<u>TOTAL OF ELEMENT NO. 5 - STREET LIGHTING</u>					
	<u>CARRIED TO SUMMARY OF BILL NO.4</u>			Kshs		
	<u>STREET LIGHTING</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO. 6</u>					
	<u>FENCING CHAINLINK</u>					
	<u>FENCING</u>					
A	1800mm high chainlink fencing consisting of 14 gauge chainlink as per "Wire Products Ltd." or any other equal and approved manufacturer tied with and including galvanized tying wire onto 3 - strands, galvanized barbed wire (measured seperately)	LM	300			
B	12½ gauge galvanized straining wire in 3 - strands as per "Khetshi Dharamshi Ltd." or any other equal and approved manufacture fixed through pre-drilled holes in vertical face of the pre-cast concrete fencing posts (measured seperately)	LM	900			
C	3 - strands, 12½ gauge galvanized barbed wire as described above fixed through pre-drilled holes in cranked sections of pre-cast concrete fencing posts (measured seperately)	LM	900			
	<u>Pre-cast concrete fencing posts</u>					
D	3000mm high, 125 x 100mm thick cranked pre-cast concrete posts pre-drilled with 6 No. (minimum) holes as per "Kenya Builders Ltd" or any other equal and approved manufacturer erected at 3000mm centres set in and including 300mm diameter x 500mm deep concrete (1:3:6) bed and surround in the ground complete with all necessary excavations and disposals.	NO	100			
	<u>Pre-cast concrete struts</u>					
E	125 x 100mm thick struts; 2400mm long set in and including 300mm diameter x 500mm deep concrete (1:3:6) bed and surround in the ground fixed to pre-cast concrete fencing posts (measured seperately) complete with all necessary excavations and disposals.	NO	34			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>FENCING</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>fencing cont'd</u>					
	<u>Mild steel gate comprising 75 x75 x 6mm thick hollow section top, bottom, intermediate rails and stiles; end capped;50 x 50 x 6mm hollow section vertical bars with capped ends welded to top bottom and intermediate rails at 100mm centres on both sides; one and half pairs purpose made hinges per leaf welded to gate leaf and gate post(M.S.); 2NO. 300mm purpose made slide bolts and 1NO. Padlock hasp welded to gate all welding ground to smooth finish.</u>					
A	Gate overall size 5000 x 2400mm high in two equal leaves 2500 x 2400mm high.	NO	1			
B	Mild steel gate posts; 100 x 100 x 6mm thick 3000mm high; 400mm diameter x 750mm deep concrete (1:2:4) base; including excavation and bedding one end of post in concrete base and backfilling with suitable material well compacted.	NO	2			
CD	Mild steel gate-stops and welded	NO	2			
	Mild steel gate-catches and welded	NO	2			
E F	<u>Touch up primer, prepare and apply two undercoats and one finish coat enamel paint to metal work on:-</u>					
	Gate surfaces generally	SM	26			
	Gate posts surfaces generally	SM	2			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>COLLECTION PAGE</u>					
	Brought forward from page 10/16					
	Brought down from above					
	<u>TOTAL OF ELEMENT NO. 6 - FENCING</u>			Kshs		
	<u>CARRIED TO SUMMARY OF BILL NO. 4</u>					
	<u>FENCING</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO. 7</u> <u>BUILDER'S WORK FOR POWER SUPPLY</u>					
	<u>Excavations and earthwork</u>					
A	Excavate trench not exceeding 1500mm deep and average 500mm deep starting from natural ground level, fill bed with 75mm thick sand, part return, fill and ram and remainder cart away after the KP&LC Ltd has installed their power supply cables	LM	200			
B	<u>Extra over</u> excavations in any positions for excavating in rock class 1.	CM	2			
C	Ditto rock class 3	CM	5			
	<u>Heavy gauge PVC conduits</u>					
DEF	100mm Diameter for power supply	LM	200			
	100mm Diameter for ICT	LM	200			
G	Concrete bed and surround Type "C" to 100mm pipe	LM	10			
	<u>Cable tiles</u>					
	"HATARI" precast concrete cable tiles laid in trench over the power supply cables	LM	200			
	<u>Manholes</u>					
	<u>Standard rectangular manholes consisting of 150mm concrete 1:3:6 bed and 250mm haunchings; 150mm dressed natural stone walling; water proofed rendering internally; 125mm concrete (1:2:4) cover slab reinforced with 10mm mild steel round bars at 150mm centres both ways with 600x450mm opening for manhole cover; standard heavy duty cast iron manhole cover and frame; cement sand (1:3) render to cover slab and exposed external surfaces; holes for large or extra large pipes, channels etc; excavations, disposal from site; formwork</u>					
H J	600 x 450 x 600mm deep for power supply	NO	10			
	600 x 450 x 450mm deep for ICT	NO	10			
	<u>TOTAL OF ELEMENT NO. 7 - BUILDER'S WORK FOR POWER SUPPLY CARRIED TO SUMMARY OF BILL NO. 4</u> <u>BUILDER'S WORK FOR POWER SUPPLY</u>			Kshs		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	ELEMENT NO. 8					
	<u>SENTRY CUBICLE / GATE HOUSE</u>					
	<u>SUBSTRUCTURES</u>					
	<u>EXCAVATION AND EARTHWORK</u>					
A	Allow for keeping the whole of the excavation free from all spring and running water by pumping or any other such means as may be necessary	ITEM				
B	Allow for maintaining and upholding the sides of excavations and keeping excavations clear of all fallen materials, rubbish etc	ITEM				
C	Excavate to reduce levels not exceeding 1.50M deep. commencing from stripped level	CM	6			
DE	Ditto exceeding 1.50M deep but not exceeding 3.0M deep	CM	2			
FG	Excavate foundation trenches not exceeding 1.50M commencing from reduced levels	CM	15			
H J	Excavate pits for bases not exceeding 1.50M commencing from reduced levels	CM	3			
K	Extra over Excavation for excavating in any position in rock class 3	CM	1			
L	Ditto rock class 1	CM	2			
M N	Return, fill in and well consolidate selected excavated material around foundations	CM	4			
	Remove all surplus excavated materials from site	CM	24			
	<u>FILLING</u>					
P	Murram filling spread, levelled and consolidated in 150mm layers including ramming ground under	CM	6			
	300mm Thick hardcore filling ditto to receive floor slabs	SM	7			
	50mm Thick murram blinding well watered and rolled on top of hardcore	SM	7			
	<u>Anti-termite treatment</u>					
	Treat the top surface of hardcore and excavated plinths with 'Premise 200 SC or 'Mwatox 350 SC insecticide as before described any other equal and approved.	SM	10			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>GATE HOUSE - SUBSTRUCTURE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Substructure cont'd</u>					
A	Level and compact bottoms of excavated foundations and bases as directed on site	SM	12			
	<u>Mass Concrete (1:4:8)as described in:-</u>					
BC	50mm Thick blinding under foundations	SM	10			
	Ditto to column bases	SM	2			
	<u>Vibrated reinforced concrete</u>					
DEF	<u>Class 25/25 mix 1:1 1/2:3 in:-</u>					
	Foundation footing	CM	2			
	Column bases and columns under foundations	CM	1			
G H J	100mm Thick ground floor slab.	SM	10			
	<u>REINFORCEMENT</u>					
K	<u>Hot rolled,ribbed high yield mild steel</u>					
	<u>Reinforcement bars to BS 4449 including soft iron tying wire and concrete spacer blocks in:-</u>					
L	8mm Diameter	KG	51			
	10mm Diameter	KG	20			
M N P	12mm Diameter	KG	52			
Q	16mm Diameter	KG	29			
	<u>BRC fabric reinforcement mesh as described:-</u>					
R	Mesh ref. No. A142 weighing 2.2.kg/m2 in floor including all tying wires and supports (measured net - No allowance made for laps)	SM	10			
	<u>Sawn formwork as described to:</u>					
	Sides of footing	SM	7			
	Battering sides of column bases	SM	2			
	To sides of columns	SM	4			
	Edges of slabs, etc 150-225mm girth	LM	13			
	<u>DAMP PROOFING</u>					
	1000 gauge polythene sheeting laid with 150mm laps measured net no allowance made for laps	SM	10			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>GATE HOUSE - SUBSTRUCTURE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Substructure cont'd</u>					
	<u>WALLING</u>					
	<u>Dressed natural stone wall bedded and jointed in cement and sand (1:4) mortar in:-</u>					
A	200mm Thick walls reinforced	SM	20			
	<u>PLINTHS</u>					
	<u>Cement and sand (1:3) render as described in:-</u>					
B	13mm Thick with wood float finish to vertical surfaces	SM	3			
	<u>Prepare and apply three coats first grade plastic emulsion paint as described on:-</u>					
C	Vertical rendered surfaces	SM	3			
	<u>Precast concrete paving slabs</u>					
D	600 x 600 x 50mm Thick precast concrete paving slabs laid on and including 50mm Thick sand bed jointed and pointed in cement and sand (1:4) mortar	SM	7			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>COLLECTION PAGE</u>					
	Brought forward from page 10/19					
	Brought forward from page 10/20					
	Brought down from above					
	<u>TOTAL FOR SUBSTRUCTURE</u>					
	<u>CARRIED TO SUMMARY</u>			Kshs		
	<u>GATE HOUSE - SUBSTRUCTURE</u>					

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ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ROOFING</u>					
A	12mm thick cement sand (1:4) laid to fall of screed with and including water proof additive to receive roofing felt	SM	15			
BC	Ditto to parapet walling 600mm high	LM	8			
D E F	4mm thick modified bituminous as APP bituminous membrane torch bonded including priming surfaces with bituminous primer and dressing around surfaces	SM	15			
G	Ditto to parapet walling	LM	8			
	20mm thick interlocking tiles of size 225 x 225mm	SM	15			
H	100mm diameter plastic fulbora outlet cast in concrete	NO	2			
	Triangle fillet size 25 x 25mm	LM	13			
J K L	<u>Sundries</u>					
M	Groove in walling for turn in waterproofing membrane	LM	13			
	<u>24 Gauge Prepainted galvanized iron in:-</u>					
	Ditto but for 90 degrees bends	NO	2			
	100 x 75mm Down pipe	LM	6			
	Extra over down pipe for sawnneck 600mm wide	NO	2			
N	Ditto but shoe.	NO	2			
	<u>PAINTING AND DECORATION</u>					
	<u>Prepare and apply two coats of zinc chromate primer and one finishing coat of gloss oil paint as manufactured by Duracoat or other equal and approved paints as described on:-</u>					
	Metal surfaces 200 - 300 girth externally	LM	3			
	<u>TOTAL FOR ROOFING</u>					
	<u>CARRIED TO SUMMARY</u>			Kshs		
	<u>GATE HOUSE - ROOFING</u>					

ITEM	DESCRIPTION	UNIT	QTY			CTS.
	<u>DOORS</u>					
	<u>EXTERNAL DOORS</u>					
	<u>Supply and fix the following purpose made steel small</u>					
	<u>pane casement doors with mild steel angle frame</u>					
	<u>primed with red oxide including building in lugs to</u>					
	<u>jamb,plugging and screwing to head and sides and</u>					
	<u>bedding frame in water proof cement mortar and</u>					
	<u>pointing in approved mastic in:-</u>					
A	Steel casement door overall size 900x2250mm high in standard door glazing sections consisting of fixed light top section size 900x300mm high and openable bottom section size 900x2100mm high with 900x300mm metal sheet at the bottom complete with necessary ironmonger,18No.small glazing obscure panes size 300x300mm fixed with putty to steel door.	NO	2			
	<u>Metal Work</u>					
B	150mm long x 50mm wide x 3mm thick fish tailed wrought iron door cramps three times bent, one end screwed into frame and the other end built in walls	NO	12			
	<u>IRON MONGERY</u>					
	<u>Supply and fix the following ironmongery complete with matching screws (Ref.is to UNION catalogue or other equal and approved)</u>					
C	Rubber door stop with rawl bolt fixed to concrete.	NO	2			
	<u>Touch up primer, prepare and apply two undercoats and one finish coat enamel paint to metal work on:-</u>					
DE	Door surfaces generally	SM	8			
	Surfaces 100 - 200mm girth	LM	24			
	<u>TOTAL FOR DOORS</u>			Kshs		
	<u>CARRIED TO SUMMARY</u>					
	<u>GATE HOUSE - DOORS</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>WINDOWS</u>					
	<u>PURPOSE-MADE CASEMENT WINDOWS</u>					
	<u>Window cill</u>					
	<u>Precast concrete (1:2:4) bedded and jointed in Cements and mortar (1:3) as described in</u>					
A	200x75mm weathered and throated window cill with smooth finish on all exposed surfaces	LM	3			
B	Splayed cutting to walls.	LM	3			
	<u>STEEL CASEMENT WINDOWS</u>					
	<u>Supply, assemble and fix the following steel casement windows with 25mm zed and tee sections to approved sample with and including; 25x6mm burglar proofing flat bars behind all open-able windows; splayed anchors;brass handles and stays of approved pattern; two coats of red oxide primer before delivery. Permanent vents to be provided to all windows with mosquito mesh reinforcement including cutting, pinning and building in lugs to jambs and pointing in cement and sand motar (1:3) as per schedules and Architect's approval</u>					
CDE	Window size 600 x 1200mm high	NO	2			
	Window size 450 x 1200mm high	NO	2			
F	Window size 600 x 600mm high	NO	1			
	<u>Metal Work</u>					
G	150x40x3mm Thick fish-tailed holdfast screwed to back of frames and built into walling	NO	30			
	<u>GLAZING</u>					
H	4mm Thick clear sheet glass and glazing to steel panes in panes exceeding 0.50 square meters but not exceeding 1.00 square metres	SM	3			
J	<u>Obscure glass</u> Ditto but obscure glass	SM	1			
	<u>Curtain Rods</u> 20mm diameter plastic double rod complete with wall brackets and rings	LM	3			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>GATE HOUSE - WINDOWS</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Windows cont'd</u>					
	<u>Burglar-proofing bars</u>					
A	50 x 25 x 4mm thick heavy guage mild steel rectangular hollow section tubes in framework and bars in burglar proofing grilles. Fabrication finished with red oxide primer with and including building into walls and making good	SM	4			
B	Apply three coats of gloss oil paint as specified to small diameter bars	SM	8			
	<u>Render, cement and sand (1:4), Steel trowelled</u>					
CD	15mm Thick cement sand(1:4)rendering to window reveal	SM	3			
	Ditto to window trim 50mm girth	LM	16			
	<u>Painting & Decoration</u>					
	<u>Prepare including and apply three coats of premium exterior quality silk vinyl paint Paints" or equal and approved to:-</u>					
E F	Window trim and surround 50mm wide	LM	16			
GH	Ditto Window reveal	SM	3			
	<u>Prepare, prime and apply two undercoats and one Finishing coat gloss oil paint on</u>					
	Metal surfaces externally	SM	4			
	Ditto but internally	SM	4			
	<u>CARRIED COLLECTION</u>			Kshs		
	<u>COLLECTION</u>					
	Brought forward from page 8/27					
	Brought down from above					
	<u>TOTAL FOR WINDOWS</u>			Kshs		
	<u>CARRIED TO SUMMARY</u>					
	<u>GATE HOUSE -WINDOWS</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>FINISHES</u>					
	<u>EXTERNAL FINISHES</u>					
	<u>Cement and sand (1:4) tyrolean render as described in:-</u>					
A	13mm Thick with wood float to vertical wall surfaces	SM	66			
	<u>Prepare surfaces, apply three coats first grade plastic emulsion paint as described on:-</u>					
B	Rendered vertical surfaces	SM	66			
	<u>INTERNAL WALL FINISHES</u>					
	<u>Gauged cement and sand(1:2:9) plaster in:-</u>					
C	13mm Thick with steel float finish to vertical surfaces	SM	26			
	<u>Cement and sand (1:5) backing in:-</u>					
D	12mm thick with approved plasticiser and screed anti fungal Treatment finish to receive tiles (measured separately)	SM	10			
	<u>Supply and fix glazed wall tiles bedded on cement sand (1:5) backing and pointed in white cement in:-</u>					
E	330 x 250 x 8mm thick tiles	SM	10			
	<u>Prepare and apply three coats of silk vinyl paint on:-</u>					
F	Plastered surfaces	SM	16			
	<u>Prepare, apply one coat of universal under coat and two coats of super gloss paint on:-</u>					
G	Plastered surfaces	SM	10			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>GATE HOUSE - FINISHES</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>FLOOR FINISHES</u>					
	<u>Kerbs</u>					
A	Concrete(1.3:6) in kerb size 100mm Thick x 75mm high including all necessary formwork	LM	1			
	<u>Cement and sand (1:3) screed as described in:-</u>					
B	20mm Thick cement sand (1:4) screed wood floated to receive terrazzo floor finishes (m.s).	SM	10			
C	Ditto to sides and top of kerbs 250mm girth including fair edges and coved junction with floor finish.	LM	1			
	<u>Terrazzo</u>					
DE	20mm Thick in-situ sanded and polished terrazzo floor finish.	SM	10			
F	Ditto to sides and top of kerbs 250mm girth including fair edges and coved junction with floor finish.	LM	1			
	20x100mm high terrazzo skirting screed (a.b.d) with coved junction and rounded top edge	LM	13			
GH	<u>Water proofed cement and sand (1:3) screed as described in:-</u>					
	40mm Thick in water room in roof space and balconies	SM	15			
	32mm thick backing finished to slope in wet areas to receive ceramic tiles	SM	10			
J	<u>Non-slip ceramic tiles laid to regular pattern, bedding and jointing in cement/sand mortar (1:4), pointing in white cement</u>					
K	Ceramic floor tiles	SM	10			
	<u>CEILING FINISHES</u>					
	<u>Cement and sand (1:4) render as described in:-</u>					
L	13mm Thick with wood float to horizontal surfaces	SM	17			
	<u>Cement, lime and sand (1:2:9) plaster steel trowelled as described to:-</u>					
M	15mm thick to horizontal soffits of ceiling	SM	15			
	<u>Prepare,apply one coat of emulsion under coat and two coats of vinylmutt paint as described to:-</u>					
	Ceiling soffits	SM	15			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>GATE HOUSE - FINISHES</u>					

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ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>PLUMBING AND DRAINAGE INSTALLATIONS ALL PROVISIONAL</u> NOTE: The RATES inserted should include for:- (1) Fixing complete with all necessary cutting and jointing along the running lengths, waste, shorts and supports. (ii) Forming chases, mortices holes in walls and concrete structure including making good surfaces. <u>NOTE: TRADE NAMES</u> Where Trade names are mentioned below, the tenderer MUST provide the same materials and other brands shall not be accepted without a written authority to supply alternative brands by the Engineer or the Architect. ALL ARE INTERNAL DIMENSIONS <u>WATER SUPPLY TO ROOF TANKS AND OVERFLOWS</u> <u>Rising main and direct feeds</u> <u>Supply and install Schedule 40(SCH40) ASTM Upvc solvent welded plumbing system as per ASTM D-2466, all traded as 'Astral aquarius' for cold water plumbing Indicated diameters are internal (Nominal Bores)</u>					
ABC	15mm Diameter pipe in wall chase or under floor slab	LM	6			
	15mm Diameter pipe in roof space	LM	5			
D E F	25mm Diameter overflows	LM	3			
GHJ	<u>Extra over UPVC pipes for:-</u> 15mm Diameter elbows 25mm Diameter elbow 15mm Equal Tee 15mm unions 15mm Female threaded Socket Adapter 25mm Female threaded Socket Adapter	NO NO NO NO NO NO	4 4 4 4 6 6			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>GATE HOUSE - PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Plumbing and drainage cont'd</u>					
	<u>Brass valves</u>					
A	15mm (NB) Diameter high pressure screw down crutch head fullway gate valve with coupling and two red lead joints	NO	2			
	<u>Water Tank</u>					
B	Supply and install 1000 litres Cylindrical plastic water tanks heavy gauge plastic cold water storage tank size 1100mm dia x 1060mm high with lockable hinged covers including hoisting and fixing at roof level approximately 15 meters from ground level	NO	1			
	<u>Ball Valve</u>					
C	Supply and fix 15mm(NB)Diameter medium pressure ball valve comprising of plastic ball and brass stem	NO	1			
	<u>Connections</u>					
D	15mm (NB) Diameter straight connections to heavy gauge plastic header tank with two back nuts and rubber washer including perforation to the tank	NO	1			
E	25mm Ditto	NO	1			
	<u>COLD WATER DISTRIBUTION</u>					
	<u>Distribution pipes to sanitary fitting</u>					
	<u>Supply and install UPVC water pipes schedule 40 for cold water plumbing Indicated diameters are INTERNAL (nominal bores)</u>					
FGH	15mm Diameter pipe in wall chase	LM	6			
J	20mm Ditto	LM	6			
	25mm Ditto	LM	6			
KLM	Ditto 25mm in roof space	LM	6			
N	<u>Extra over UPVC pipes for</u>					
	15mm Diameter bends	NO	4			
	25mm Ditto	NO	2			
	20mm Equal Tee	NO	2			
	25mm Ditto	NO	2			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>GATE HOUSE - PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	UNIT	QTY			CTS.
	<u>Extra over UPVC pipes for</u>					
A B C	25 x 20mm Diameter Reducer	NO	2			
D E F	25 x 15mm Diameter Reducer	NO	3			
G	20 x 15mm Diameter Reducing tee	NO	2			
	25mm union	NO	3			
H	15mm Diameter male adapter socket	NO	2			
	15mm Diameter female adapter socket	NO	2			
J	25mm Diameter female adapter socket	NO	4			
	<u>Brass gate valves</u>					
	25mm (NB) Diameter low pressure Peglar screw down crutch head stop cork with coupling and two red lead joints	NO	2			
	<u>Connections</u>					
K	25mm (NB) Diameter straight connections to heavy gauge plastic header tank with two back nuts and rubber washer including perforation to the tank	NO	1			
	<u>SANITARY FITTING</u>					
	<u>Supply and install the following sanitary fittings and accessories including all connections to services, wastes, jointing to supply, over flows pipes and all plugging and screwing to walls and floors.</u>					
	<u>ASIAN TYPE WATER CLOSET</u>					
L	Squatting type water closet suite in white vitreous china comprising of WC bowl with top plate and integral foot treads, "S" trap connector, 9 litres low level ceramic	NO	1			
M	cistern and cistern fittings including siphon, 15mm side inlet ball valve, 20mm side overflow, plastic flush pipe, inlet connector and cistern supports.					
	<u>Water closet accessories</u>					
	White vitreous china built in toilet roll holder size 205x150 mm as "Ideal ceramics" or equal and approved.	NO	1			
	15mm diameter flexible connectors, 300mm long complete with chrome plated angle valve including union jointing to steel tubing and the sanitary fittings.	NO	1			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>GATE HOUSE - PLUMBING AND DRAINAGE</u>					

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ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Plumbing and drainage cont'd</u>					
	<u>Mirror</u>					
A	610 x 457 x6mm Thick Glass plate mirror as "Impala glass" or equal and approved fixed to wall with 4No.chrome plated dome capped screws and 5mm thick foam back rest.	NO	1			
	<u>Testing</u>					
B	Allow for pressure testing the whole of cold water supply while in progress and on completion to the satisfaction of the Engineer.		ITEM			
	<u>INTERNAL DRAINAGE</u>					
	<u>Supply and install uPVC soil system to BS 4660 and BS 4515 and MuPVC waste systems to BS 5255 with screwed and socketed joints to BS 21. Solvent welded joints fixed as manufacturer's written instructions.</u>					
C D E	32mm Diameter pipe UPVC grey in wall chase or floor slab	LM	6			
FG	40mm Ditto	LM	6			
	50mm Ditto	LM	4			
HJ K	100mm Ditto	LM	4			
LM N	100mm Ditto but golden brown in floor slab and in trenches	LM	10			
PQR	<u>Extra over pipe for:-</u>					
	32mm Diameter bend	NO	2			
	40mm Ditto	NO	3			
	50mm Ditto	NO	2			
	100mm Ditto	NO	4			
	100mm long radius bend	NO	1			
	40mm Equal tee	NO	1			
	50mm tee	NO	1			
	100mm ditto	NO	1			
	50mm diameter plug	NO	2			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>GATE HOUSE - PLUMBING AND DRAINAGE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Plumbing and drainage cont'd</u>					
A B C	100mm diameter Ditto.	NO	1			
D E F	100mm Single branch	NO	1			
G H J	100mm diameter WC connectors	NO	1			
	40 x 100mm boss connector	NO	1			
K	50 x 100mm boss connector	NO	1			
	40 x 32 mm reducer	NO	1			
	50 x 40mm reducer	NO	1			
L	100mm diameter weathering slate and apron	NO	1			
	100mm diameter vent cowl	NO	1			
	<u>Floor traps</u>					
	100mm Diameter heavy gauge PVC 4-way floor trap with plastic grating	NO	2			
	<u>Testing</u>					
	Allow for testing the whole of internal drainage works while in progress and on completion to the satisfaction of the Engineer and Local Authority (In No.20)		ITEM			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>GATE HOUSE - PLUMBING AND DRAINAGE</u>					

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ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELECTRICAL INSTALLATION</u>					
	<u>NOTES</u> <i>The electrical installation shall unless otherwise specified herein comply with the provisions of the latest edition and supplement rules and regulations published by the Institute of Electrical Engineers (I.E.E) and shall also be in accordance with the requirements of Kenya Power and Lighting Company Limited</i> <i>All the Electrical Installations Specialist's work should include RATEs for builder's work and making good , providing plugs for items and all necessary fittings and to be carried out by a licensed/registered electrician whose license and name shall be approved by the Engineer before his work starts on site.</i> <i>RATEs to include for forming chases, mortices, holes in walls and concrete structure and making good disturbed surfaces.</i> <u>NOTE: TRADE NAMES</u> Where Trade names are mentioned below, the tenderer MUST provide the same materials or other equal and approved therefore other brands shall not be accepted without a written authority to supply alternative brands by the Engineer or the Architect. <u>LIGHTING POINTS AND SWITCHES</u> <u>Supply, install, test and commission the following</u>					
A	Lighting points wired in 3 x 1.5mm ² PVC insulated single core cables (SC) copper in concealed 20mm diameter Heavy Gauge PVC conduits in walls and floors	NO	4			
B	Ditto but two way.	NO	2			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>GATE HOUSE - ELECTRICAL INSTALLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Electrical installation cont'd</u>					
	<u>Supply and install the following lighting switches on recessed switch boxes as MK or other equivalent</u>					
A B C	10A plate switch one gang one way Cat. No.GGBL1011	NO	4			
D	10A plate switch one gang Two way Cat.No. GGBL1012	NO	1			
	10A plate switch two gang two way Cat. No. GGBL1022	NO	1			
E	10A intermediate switch as Cat. GGBL1014	NO	1			
	<u>Supply and install the following lighting fittings</u>					
F	60W BC pendant lamp holder with 300mm long heat resisting PVC insulated and sheathed 0.7sqmm 2C circular cable c/w energy saving as MK Cat. No. 1149 WHI	NO	1			
G	60W straight batten lamp holder c/w energy saving lamps as MK Cat. No. 1154 WHI	NO	1			
H	1220mm 36W HPF single bare batten flourescent fitting complete with flourescent tube as Philips TMS011 1 x TL – D36W	NO	2			
J	610mm 18W HPF single bare batten flourescent fitting complete with flourescent tube as Philips TMS011 1 x TL – D18W	NO	1			
K	Screw neck ball light fitting with BC lamp holder and opal glass cover as 'Micromark' Cat. No. MM7531	NO	1			
L	Circular surface fitting with E27 lamp holder with polycarbonate body and opal diffuser as OMS Cat. No. PLAST 3 1x60W	NO	2			
	Weather proof bulk head fitting as per range with opal diffuser black trim and E27 CFL lamp as Tam-lite TORNADO. Cat. No. Tam-lite TOR100BH/B	NO	4			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>GATE HOUSE - ELECTRICAL INSTALLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Electrical installation cont'd</u>					
	<u>POWER POINTS AND OUTLETS</u>					
	<u>Supply and install the following power points to work complete with all necessary assesories</u>					
A	13 AMPs Ring twin switched socket outlet points wired in 3x2.50mm ² PVC Single Core copper cable drawn in 20mm Heavy Gauge PVC conduits concealed in the walls and floors, one way switched with all accessories but excluding the socket outlet plate as "SCHNEIDER" Cat. No. GGBL3020D	NO	4			
BC	Ditto for watertight single switched fused spur unit ditto	NO	2			
D	13A Weatherproof twin switched socket as as "SCHNEIDER" Cat. No. LWP3010	NO	2			
	13 Amps Twin switched sockets "SCHNEIDER" Cat. No. GGBL3020D	NO	4			
	<u>TELEPHONE & TELEVISION OUTLETS</u>					
E	<u>Supply, install, test and commission:-</u>					
F	32mm Diameter H.G. PVC Conduits for linking the adaptable boxes concealed in the walls and floor with all accessories for Telephone and Television (T.V.)	LM	6			
GHJ	38mm Diameter H.G. PVC Conduits for linking the adaptable boxes concealed in the walls and floor with all accessories for Power	LM	3			
K	Ditto but 50mm diameter from power manhole	LM	2			
	Ditto but 100mm	LM	2			
L	Telephone outlet point comprising of 20mm diameter HG PVC conduits and draw wire, concealed in walls and floors	NO	2			
	TV/FM & satelite triplexer socket outlet (IEC male) as "SCHNEIDER" Cat. No. GGBL7081	NO	2			
	1 gang euro plate with module adapter and RJ11/RJ45 socket outlet as "SCHNEIDER" Cat. No. GGBL7071C6	NO	2			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>GATE HOUSE - ELECTRICAL INSTALLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Electrical installation cont'd</u>					
	<u>SUB MAINS AND DISTRIBUTION</u>					
A	Supply and install 6-way SPN consumer unit complete with 63A SPN integral isolator for flush mounting and the following MCB's as Crabtree 32A; 2 No., 20A; 2 No., 10A; 1 No. with 1 No. blanking plate	NO	1			
B	Ditto but 4-way with the following MCB's as Crabtree, 20A; 2 No., 6A; 1 No. with 1 No. blanking plates	NO	1			
C	Carry out very concise permanent labelling for all the sub circuits in the board as before described (18 No.)	ITEM	1			
D	Sub-mains comprising of 3 x 16mm ² SC copper cables drawn in 38mm HG PVC conduits from the switchboard to the consumer unit as before described.	LM	10			
E	300 x 300 x 50mm 14 gauge galvanized iron sheet power draw box complete with cover	NO	1			
	<u>Meter board</u>					
F	Supply and install single tariff meter box comprising of wall mounted meter board complete with 80AMPS double pole moulded switch fuse and 1 No. 80 AMPS cut-out including painting.	NO	1			
G	Allow for prepaid meter communication cable wired in 2 core cable and drawn in 25mm diameter PVC conduit	LM	5			
	<u>Supply and install the following as described:-</u>					
H	Supply and install Earthing for the above meter board, complete with Earthing Matt measuring 1.0 x 1.0m built in 25mm x 3mm thick riveted with copper rivets (Total length of copper tape required 20m). 2 No earth electrodes, and 2 No. Rod to tape clamps. The earth matt to be treated by charcoal and salt to obtain reading of < (less than) 1.0 ohms.	ITEM	1			
J	Supply and install 300mm x 300mm concrete earth inspection pit complete with heavy duty manhole covers.	NO	1			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>GATE HOUSE - ELECTRICAL INSTALLATION</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Electrical installation cont'd</u>					
A	Supply and install 1 x 16mm ² PVC/PVC Earth lead from Matt to Equipotential bars (2 No.)	LM	2			
BCD	PG cable glands for item above	NO	1			
	PG cable lugs for item above	NO	1			
	Testing, Commissioning and Hand over the entire Installation to the Electrical Engineer's Satisfaction.	ITEM				
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>COLLECTION</u>					
	Brought forward from page 10/39					
	Brought forward from page 10/40					
	Brought forward from page 10/41					
	Brought forward from page 10/42					
	Brought down from above					
	<u>TOTAL FOR ELECTRICAL INSTALLATION</u>					
	<u>CARRIED TO SUMMARY</u>			Kshs		
	<u>GATE HOUSE - ELECTRICAL INSTALLATION</u>					

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ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELEMENT NO. 9</u>					
	<u>DUST BIN CUBICLE SUBSTRUCTURES</u>					
	<u>EXCAVATION AND EARTHWORK</u>					
A	Allow for keeping the whole of the excavation free from all spring and running water by pumping or any other such means as may be necessary	ITEM				
B	Allow for maintaining and upholding the sides of excavations and keeping excavations clear of all fallen materials, rubbish etc	ITEM				
C	Excavate to reduce levels not exceeding 1.50M deep. commencing from stripped level	CM	8			
DE	Excavate foundation trenches not exceeding 1.50M commencing from reduced levels	CM	18			
FG	Extra over Excavation in any position for excavating in rock class 3	CM	3			
H	Ditto rock class 1	CM	2			
	Return, fill in and well consolidate selected excavated material around foundations	CM	5			
J	Remove all surplus excavated materials from site	CM	26			
KL	<u>FILLING</u>					
	Murram filling spread, levelled and consolidated in 150mm layers including ramming ground under	CM	4			
M	300mm Thick hardcore filling ditto to receive floor slabs	SM	16			
	50mm Thick murram blinding well watered and rolled on top of hardcore	SM	16			
	<u>Anti-termite treatment</u>					
	Treat the top surface of hardcore and excavated plinths with 'Premise 200 SC or any other equal and approved insecticide.	SM	20			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>DUSTBIN CUBICLE - SUBSTRUCTURE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>Substructure cont'd</u>					
A	Level and compact bottoms of excavated foundations and bases as directed on site	SM	11			
	<u>Mass Concrete (1:4:8)as described in:-</u>					
B	50mm Thick blinding under foundations	SM	11			
	<u>Vibrated reinforced concrete</u>					
	<u>Class 25/25 mix 1:1 1/2:3 in:-</u>					
CD	Foundation footing	CM	2			
	100mm Thick ground floor slab.	SM	20			
	<u>REINFORCEMENT</u>					
	<u>Hot rolled,ribbed high yield mild steel</u>					
E F	<u>Reinforcement bars to BS 4449 including soft iron tying wire and concrete spacer blocks in:-</u>					
	8mm Diameter	KG	21			
G	10mm Diameter	KG	44			
	<u>BRC fabric reinforcement mesh as described:-</u>					
H J	Mesh ref. No. A142 weighing 2.2.kg/m2 in floor including all tying wires and supports (measured net - No allowance made for laps)	SM	20			
	<u>Sawn formwork as described to:</u>					
K	Sides of footing	SM	7			
	Edges of slabs, etc 150-225mm girth	LM	19			
	<u>DAMP PROOFING</u>					
	1000 gauge polythene sheeting laid with 150mm laps measured net no allowance made for laps	SM	20			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>DUSTBIN CUBICLE - SUBSTRUCTURE</u>					

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ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>CONCRETE IN SUPERSTRUCTURE</u>					
	<u>Vibrated reinforced concrete Class 25/25 mix(1:1 1/2:3)</u>					
ABC	Beams	CM	1			
	Steps	CM	3			
	Landing	SM	3			
	<u>REINFORCEMENT</u>					
DEF	<u>Hot rolled,ribbed high yied mild steel reinforcement bars to BS 4449 including soft iron tying wire and :- concrete spacer blocks in:-</u>					
G H J	8mm Diameter	KG	179			
KLM	10mm Diameter	KG	162			
	12mm diameter	KG	32			
	<u>Sawn formwork to:-</u>					
	Sides and soffits of beams	SM	14			
	Horizontal soffites of landing	SM	3			
	Slopping soffits of stairs	SM	7			
	Edges of landing 75 - 150mm high	LM	11			
	Edges of riser 75 - 150mm high	LM	20			
	Edges of staircase strings 400mm wide(extreme) including cutting to form profile of treads and risers	LM	7			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>DUSTBIN CUBICLE - CONCRETE IN SUPERSTRUCTURE</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ROOFING</u>					
	<u>Roof structure</u>					
	<u>Nailed and Bolted connections</u>					
	<u>All structural timber shall be sawn celcure treated second grade cypress timber members in:-</u>					
AB	75 x 50mm thick purlins	LM	50			
C	100 x 50mm thick wall plate	LM	12			
	12mm Diameter mild steel anchor bolt x 150mm long fixed at 1200mm centres	NO	10			
D E F	<u>The following in 1NO. double pitch roof trusses spanning 4000mm and 1300mm high</u>					
G	100 x 50mm thick rafters	LM	53			
	100 x 50mm thick Ridge Board	LM	6			
	100 x 50mm thick ceiling joist	LM	4			
	100 x 25mm thick Splice pieces 1000mm long	NO	18			
H J	<u>Roof covering</u>					
	<u>Gauge 28 "Versatile" Aluminium pre-painted "Metcoppo" corrugated iron sheets as per "Kaluworks Ltd" or any other equal and approved manufacturer to:-</u>					
	Roof covering	SM	30			
	Ridging	LM	6			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>DUSTBIN CUBICLE - ROOF</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>DOORS</u>					
	<u>EXTERNAL DOORS</u>					
	<u>Supply and fix the following purpose made steel small</u>					
	<u>pane casement doors with mild steel angle frame</u>					
	<u>primed with red oxide including building in lugs to</u>					
	<u>jamb, plugging and screwing to head and sides and</u>					
	<u>bedding frame in water proof cement mortar and</u>					
	<u>pointing in approved mastic in:-</u>					
A	Steel casement door overall size 1750 x 2600mm high in standard door complete with necessary ironmongery	NO	2			
	<u>Metal Work</u>					
B	150mm long x 50mm wide x 3mm thick fish tailed wrought iron door cramps three times bent, one end screwed into frame and the other end built in walls	NO	12			
	<u>Touch up primer, prepare and apply two</u>					
	<u>undercoats and one finish coat enamel</u>					
	<u>paint to metal work on:-</u>					
CD	Door surfaces generally	SM	18			
	Surfaces 100 - 200mm girth	LM	17			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>DUSTBIN CUBICLE - DOORS</u>					

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS.	CTS.
	<u>ELECTRICAL INSTALLATION</u> <u>NOTES</u> <i>The electrical installation shall unless otherwise specified herein comply with the provisions of the latest edition and supplement rules and regulations published by the Institute of Electrical Engineers (I.E.E) and shall also be in accordance with the requirements of Kenya Power and Lighting Company Limited</i> <i>All the Electrical Installations Specialist's work should include RATEs for builder's work and making good , providing plugs for items and all necessary fittings and to be carried out by a licensed/registered electrician whose license and name shall be approved by the Engineer before his work starts on site.</i> <i>RATEs to include for forming chases, mortices, holes in walls and concrete structure and making good disturbed surfaces.</i> <u>NOTE: TRADE NAMES</u> Where Trade names are mentioned below, the tenderer MUST provide the same materials or other equal and approved therefore other brands shall not be accepted without a written authority to supply alternative brands by the Engineer or the Architect. <u>LIGHTING POINTS AND SWITCHES</u> <u>Supply, install, test and commission the following</u>					
A	Lighting points wired in 3 x 1.5mm ² PVC insulated single core cables (SC) copper in concealed 20mm diameter Heavy Gauge PVC conduits in walls and floors	NO	1			
	<u>CARRIED TO COLLECTION</u>			Kshs		
	<u>DUSTBIN CUBICLE - FINISHES</u>					

ITEM	DESCRIPTION	SHS.	CTS.
	<u>DUSTBIN CUBICLE</u>		
	<u>COLLECTION</u>		
	Brought forward from page 10/45		
	Brought forward from page 10/46		
	Brought forward from page 10/47		
	Brought forward from page 10/48		
	Brought forward from page 10/49		
	Brought forward from page 10/50		
	Brought forward from page 10/51		
	Brought forward from page 10/52		
	Brought forward from page 10/53		
	Brought forward from page 10/54		
	<u>TOTAL FOR DUSTBIN CUBICLE</u>		
	<u>CARRIED TO SUMMARY OF BILL NO 4</u>	Kshs	
	<u>DUSTBIN CUBICLE</u>		

ITEM	DESCRIPTION			KSHS.	CTS.
A B C D E F G H J	<u>BILL NO.4</u> <u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT SECTOR A - HOMABAY COUNTY</u> <u>EXTERNAL WORKS</u> <u>SUMMARY</u>				
	<u>ELEMENT NO.</u>	<u>DESCRIPTION</u>	<u>FROM PAGE</u>		
	1	SITE CLARANCE & LANDSCAPING	10/01		
	2	ROADS AND STORMWATER DRAINAGE	10/05		
	3	WATER RETICULATION	10/10		
	4	FOUL WATER DRAINAGE	10/13		
	5	STREET LIGHTING	10/15		
	6	FENCING	10/17		
	7	BUILDER'S WORK FOR POWER SUPPLY	10/18		
	8	SENTRY CUBICLE/GATE HOUSE	10/44		
	9	DUSTBIN CUBICLE	10/55		
<u>TOTAL OF BILL NO. 5 SECTION NO. 10 - EXTERNAL WORKS</u>					
<u>CARRIED TO GRAND SUMMARY</u>			Kshs		
<u>EXTERNAL WORKS</u>					

SECTION ELEVEN PRIME COST
(P.C.) SUMS
AND PROVISIONAL SUMS
BILL NO. 6

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>BILL NO. 6</u>					
	<u>PRIME COST AND PROVISIONAL SUMS</u>					
	<u>COST SUMS</u>					
	<u>POWER SUPPLY</u>					
A	Allow a Prime cost sum of Kenya Shillings Three Million (Kshs. 3,000,000.00) only for KPLC supply charges.		SUM		3,000,000	
BC	Allow for Profit	%ITEM			
	Allow for Attendance					
D	<u>LOCAL DOORS' SPECIALISTS</u>					
	Include the sum of Kenya Shillings Five Million (Kshs. 5,000,000.00) only for Supply, and Delivery		SUM			
E	of Local Jua-kali Fabricated Doors by doors specialists.	%		5,000,000	
	Allow for Profit					
G	<u>LOCAL WINDOWS' SPECIALISTS</u>					
	Include the sum of Kenya Shillings Six Million (Kshs. 6,000,000.00) only for Supply, and Delivery		SUM			
H	of Local Jua-kali Fabricated Windows by windows specialists.	%		6,000,000	
	Allow for Profit					
	<u>CARRIED TO COLLECTION</u>			KShs.		

ITEM	QTY	UNIT	RATE	SHS	CTS
<u>PROVISIONAL SUMS</u>					
<u>CONNECTION</u>					
A Allow a Provisional sum of Kenya Shillings Five Hundred Thousand (Kshs. 500,000.00) for connection of utility serviceswater and drainage		SUM		500,000	
<u>RE-ROUTING OF SERVICES</u>					
B Allow a Provisional sum of Kenya Shillings Five Hundred Thousand (Kshs. 500,000.00) for re-routing of utility services		SUM		500,000	
<u>SIGNAGE</u>					
C Allow a Provisional sum of Kenya Shillings One Million Only (Kshs. 1,000,000.00) for signage.		SUM		1,000,000	
<u>CONTIGENCIES</u>					
D Allow a Provisional sum of Kenya Shillings TEN Million Only (Kshs. 10,000,000.00) for Contingencies.		SUM		10,000,000	
<u>CARRIED TO COLLECTION</u>		KShs.			
<u>SECTION NO. 11 - BILL NO. 6 PRIME COST AND PROVISIONAL SUMS COLLECTION</u>					
Brought forward from page 11/01					
Brought forward from page Above					
<u>TOTAL FOR PRIME COST AND PROVISIONAL SUMS</u>					
<u>CARRIED TO GRAND SUMMARY</u>		KShs.			

SECTION TWELVE

SCHEDULE OF RATESBILL

NO. 7

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<p align="center"><u>BILL NO. 5</u></p> <p><u>SCHEDULE OF RATES</u></p> <p><u>NOTE:</u></p> <p>1. The rates inserted herein are to include for all costs of labour, overheads and contractors profit.</p> <p>2. The rates shall be the basis for variations for the works executed on Architects or Engineers variations.</p> <p><u>This section shall form part of the contract and as such, it shall form part of key considerations to be made for purposes of analyzing the bidders for price competitiveness.</u></p> <p><u>EPS PANEL WALLING</u></p> <p><u>Expanded Polystyrene panel manufactured National Housing Corporation -EPS factory, complete with 3mm galvanised steel mesh on both sides joined using galvanised binding wire and anchored to concrete surfaces.</u></p> <p>A Supply and fix 60mm thick single wall panels density 15kg/m3 including necessary supports internal walling</p> <p>B Supply and fix 80mm thick single wall panels density 20kg/m3 including necessary supports internal walling</p> <p><u>Galvanised wiremesh manufactured by the National Housing Corporation.</u></p> <p>CD E Flat mesh to corner openings</p> <p>Ditto U- mesh to openings</p> <p>F Ditto Bent/Angle mesh to coners</p> <p><u>WALLING</u></p> <p>GH 200mm Thick solid concrete block walling bedded and jointed in cement sand (1:3) mortar reinforced with hoop iron in alternate courses.</p> <p>150mm Thick approved 'Ravenna' clay grille walling ditto.</p> <p>150mm thick concrete vent blocks bedded and jointed in cement and sand mortar (1:3)</p> <p><u>CARRIED TO COLLECTION</u></p> <p><u>PROPOSED NHC</u></p> <p><u>SCHEDULE OF RATES</u></p>					
		1	SM			
		1	SM			
		1	KG			
		1	KG			
		1	KG			
		1	SM			
		1	SM			
		1	SM			
				KShs.		

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>EPS PANELS</u> <u>Expanded Polystyrene panel manufactured by the National Housing Corporation – EPS factory, Complete with 3mm galvanised steel mesh on both sides joined using galvanised binding wire</u>					
A	Supply and fix 150mm thick EPS suspended floor panels density 15KG/M3 including necessary supports	1	SM			
B	Supply and fix 200mm thick EPS suspended floor panels density 20KG/M3 including necessary supports	1	SM			
	<u>Shortcrete Class 25 1:11/2:3 structural plaster (cement, sand and quarry dust) applied to panels</u>					
CD	35mm Thick finish to soffits of suspended slab	1	SM			
	35mm Thick finish to walls	1	SM			
E	<u>BRC fabric reinforcement mesh as described:-</u> Mesh ref. No. A98 weighing 1.54.kg/m2 in floor including all tying wires and supports (measured net - No allowance made for laps)	1	SM			
	<u>CONCRETE WORKS</u> <u>Hollow pot slab</u>					
F	175mm Thick hollow pot slab comprising of 300 x 125mm hollow clay blocks at 405mm centres; 100mm wide reinforced concrete mix 1:2:4 ribs and 50mm thick toping.	1	SM			
G	250mm ditto	1	SM			
	<u>CARRIED TO COLLECTION</u>					
	<u>PROPOSED NHC SCHEDULE OF RATES</u>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>ROOFING</u>					
	<u>Roof covering</u>					
A	Gauge 28 coloured pre-painted corrugated iron roofing sheets as manufactured by M/S Mabati rolling mills Ltd	1	SM			
BC	Ditto matching ridge	1	LM			
	"DECRA ROOFING" stone coated roofing cover as supplied by Space and Style Limited.	1	SM			
D E	Gauge 26 prepainted 'IT5' or BP 950 profiled roofing sheets as manufactured by M/S Mabati rolling mills Ltd	1	SM			
	Ditto matching ridge.	1	LM			
FGH	<u>WINDOWS</u>					
	<u>Sets of galvanised aluminium louvre jamb unit with blade carriers for 150mm wide blades secured to steel or timber with screws.</u>					
JK	4 - blade unit	1	NO			
	6 - blade unit	1	NO			
LM	8 - blade unit	1	NO			
	<u>5mm thick sheet (Ordinary Quality) louvre glass 150mm wide with ground edges and ends set in metal clips.</u>					
N	Clear sheet louvre glass	1	LM			
	Obscure sheet louvre glass	1	LM			
P	<u>CEILING FINISHES</u>					
	Plastic "T & G" ceiling boards as "Vista Ceilings" or equal and approved	1	SM			
	Ditto Plastic cornice	1	LM			
	<u>FLOOR FINISHES</u>					
	<u>PVC floor tiles to BS 3261 fixed with adhesive as per manufacturers printed instructions.</u>					
	300 x 300 x 2mm thick PVC floor tilling.	1	SM			
	<u>Polished granolithic paving</u>					
	40mm thick paving laid on floors	1	SM			
	<u>CARRIED TO COLLECTION</u>					
	<u>PROPOSED NHC</u>					
	<u>SCHEDULE OF RATES</u>					
				KShs.		

ITEM	DESCRIPTION	UNIT	QTY	RATE	SHS	CTS
	<u>ELEMENT NO. 6</u>					
	<u>(POWDER COATED ALUMINIUM FRAMED AND ALUMINIUM SLIDING WINDOWS</u>					
	<u>POWDER-COATED FRAMED AND SLIDING WINDOWS</u>					
A	1200 x 1500mm high overall size consisting of 2No top fixed lights size 600mm x 300mm high and 2No. Bottom fixed light size 600mm x 300mm high , 2No. Sliding windows size 600 x 900mm comprising of 25mm x 50mm high in 2mm thick aluminium as Window	NO	1			
	<u>POWDER-COATED FRAMED WINDOWS</u>					
B	600 x 900mm high overall size consisting of 1No Top hung openable lights size 600mm x 600mm high and 1No. Bottom fixed light size 600mm x 300mm high, comprising of 25mm x 50mm high in 2mm thick aluminium as Window	NO	1			
	<u>WINDOW JOINERY</u>					
	<u>CURTAIN RODS</u>					
	<u>BRASS CURTAIN RODS</u>					
	<u>Supply and fix approved quality brass circular section curtain rail/track complete with runners and stopped ends. (Assume Single Rail)</u>					
CD E	125 x 25mm Double curtain rod holders of approved patter	NO	1			
	30mm Diameter 3mm Thick inner curtain rod	LM	1			
	25mm Diameter 3mm Thick outer curtain rod	LM	1			
	<u>CARRIED TO COLLECTION WINDOWS</u>					
				Kshs.		-

[illegible]

ITEM	DESCRIPTION	UNIT	NOMINAL QTY	RATE	SHS	CTS
	SCHEDULE OF DAYWORK RATES-MATERIALS					
DWM1	Cement	Bags	1			
DWM2	Mild steel Reinforcement	Tons	1			
DWM3	Sand	Tons	1			
DWM4	Ballast	Tons	1			
DWM5	Hardcores	Tons	1			
DWM6	Machine Cut Stones (200mm)	Nr	1			
DWM7	Machine Cut Stones (150mm)	Nr	1			
DWM8	Natural fine Chiselled Stones 200mm	Feet	1			
DWM9	200mm Concrete Blocks	Nr	1			
DWM10	150mm Concrete Blocks	Nr	1			
DWM11	100mm Concrete Blocks	Nr	1			
DWM12	150mm Clay Brick Walling	Nr	1			
DWM13	100mm Clay Brick Walling	Nr	1			
DWM14	75mm Clay Brick Walling	Nr	1			
DWM15	25mm Blockboards	M2	1			
DWM16	25mm MDF Boards	M2	1			
DWM17	20mm Gypsum Boards	M2	1			
DWM18	8mm Thick Glass	M2	1			
DWM19	Ceramic Floor Tiles	M2	1			
DWM20	Ceramic Wall Tiles	M2	1			
DWM21	Granito tiles	M2	1			
DWM22	Natural Stone Mazeras	M2	1			
DWM23	150 x 50 mm Cypress Timber	Feet	1			
DWM24	100 x 50mm Cypress Timber	Feet	1			
DWM25	75 x 50mm Cypress Timber	Feet	1			
DWM26	50 x 50mm Cypress Timber	Feet	1			
	CARRIED TO COLLECTION			Kshs.		
	SCHEDULE OF DAYWORK RATES - MATERIALS					

ITEM	DESCRIPTION	UNIT	NOMINAL QTY	RATE	SHS	CTS
	SCHEDULE OF DAYWORK RATES-CONTRACTOR EQUIPMENTS					
DWE1	Trucks Upto and Including 1 Ton	Hour	1			
DWE2	Trucks 3 Ton	Hour	1			
DWE3	Trucks Over 7 Ton	Hour	1			
DWE4	Welding Machines	Hour	1			
DWE5	Excavators	Hour	1			
DWE6	Dumpers Concrete	Hour	1			
DWE7	Mixers Concrete	Hour	1			
DWE8	VibratorsDozers	Hour	1			
DWE9	7Ton Naumatic Roller	Hour	1			
DWE10	Pneumatic Compresor With 2 Breakers	Hour	1			
DWE11	3HP Water Pump	Hour	1			
DWE12	15KVA Generator	Hour	1			
DWE13		Hour	1			
	CARRIED TO COLLECTION					
	SCHEDULE OF DAYWORK RATES-CONTRACTOR EQUIPMENTS			Kshs.		

ITEM	DESCRIPTION	QTY	UNIT	RATE	SHS	CTS
	<u>BILL NO. 5 SCHEDULE OF RATES</u>					
	<u>COLLECTION</u>					
	Brought forward from page 12/01					
	Brought forward from page 12/02					
	Brought forward from page 12/03					
	Brought forward from page 12/04					
	Brought forward from page 12/05					
	Brought forward from page 12/06					
	Brought forward from page 12/07					
	<u>TOTAL FOR SCHEDULE OF RATES, DAYWORK</u>					
	<u>RATES FOR LABOUR, MATERIALS AND</u>					
	<u>CONTRACTOR'S EQUIPMENTS</u>					
	<u>CARRIED TO GRAND SUMMARY</u>					
	<u>PROPOSED NHC</u>			KShs.		
	<u>SCHEDULE OF RATES, LABOUR, MATERIALS AND</u>					
	<u>CONTRACTOR'S EQUIPMENT</u>					

SECTION THIRTEEN GRAND

SUMMARY

GRAND SUMMARY

ITEM	DESCRIPTION	KSHS	CTS
	<p align="center"><u>PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT PHASE ONE SECTOR A HOMABAY COUNTY GRAND SUMMARY</u></p> <p><u>DESCRIPTION</u> <u>PAGE</u></p> <p>1 Bill NO. 1: GENERAL AND PARTICULAR PRELIMINARIES 6/25</p> <p>2 BILL NO. 2: BUILDER'S WORK TWO BEDROOMED FLATS 7/49</p> <p>3 BILL NO. 3: BUILDER'S WORK ONE BEDROOMED FLATS 8/44</p> <p>4 BILL NO. 4: BUILDER'S WORK STUDIO UNITS 9/38</p> <p>5 Bill NO.5: EXTERNAL WORKS 10/56</p> <p>6 Bill NO. 6: PRIME COST (P.C.) AND PROVISIONAL SUMS 11/02</p> <p>7 Bill NO.7: SCHEDULE OF RATES 12/08</p> <p><u>TOTAL AMOUNT CARRIED TO FINANCIAL PROPOSAL FORM</u> Kshs.</p> <p>CONTRACTOR'S NAME.....</p> <p>ADDRESS.....</p> <p>.....</p> <p>AUTHORISED SIGNATURE.....</p> <p>DATE.....</p> <p>NAME OF WITNESS.....</p> <p>SIGNATURE.....</p> <p>ADDRESS.....</p> <p>OCCUPATION.....</p> <p>DATE.....</p>		

SECTION FOURTEEN

APPENDIX "A"

SCHEDULE/LIST OF DRAWINGS

PROPOSED CONSTRUCTION OF HOMABAY AFFORDABLE HOUSING PROJECT PHASE ONE SECTOR A

AT HOMABAY COUNTY

APPENDIX 'A'

SCHEDULE OF DRAWINGS

List of drawings from which these Bills of Quantities have been prepared and which (drawings) may be viewed at the office of the Architect/Engineer/Quantity Surveyor.

1. SITE LAYOUT

Site layout Plan Site Office

Site Signboard

2. HOUSE TYPE 'TWO, ONE BEDROOM AND STUDIO UNITS'

Ground and Typical Floor Plans Elevations and Sections

Typical Floor slab R.C. Details;

Floor beams layout; and beams sections

VRC Columns details

Staircase Details Roof plan

Steel Window Details. Doors Details.

3. PLUMBING WORKS

Drainage layout - Flat Type "2BR" Plumbing Layout - Flat Type

"2BR" Drainage layout - Flat Type "1BR" Plumbing Layout - Flat

Type "1BR" Drainage layout - Flat Type "Studio Units"

Plumbing Layout - Flat Type "Studio Units"

4. ELECTRICAL WORKS

Electrical floor plan – Flat Type "2Bedroom" Electrical floor plan –

Flat Type "1Bedroom " Electrical floor plan – Flat Type "Studio

Units"

5. PATHS AND STORM WATER (OTHER CIVIL WORKS)

Sewer and Storm Water Drainage

Foot Paths and storm water

Drainage layout

6. FLATS EXTERNAL DRAINAGE

Sewer and Storm Water Drainage

Typical drainage Layout Flat Type "G"

7. FOUL WATER DRAINAGE

Sewer Layout site

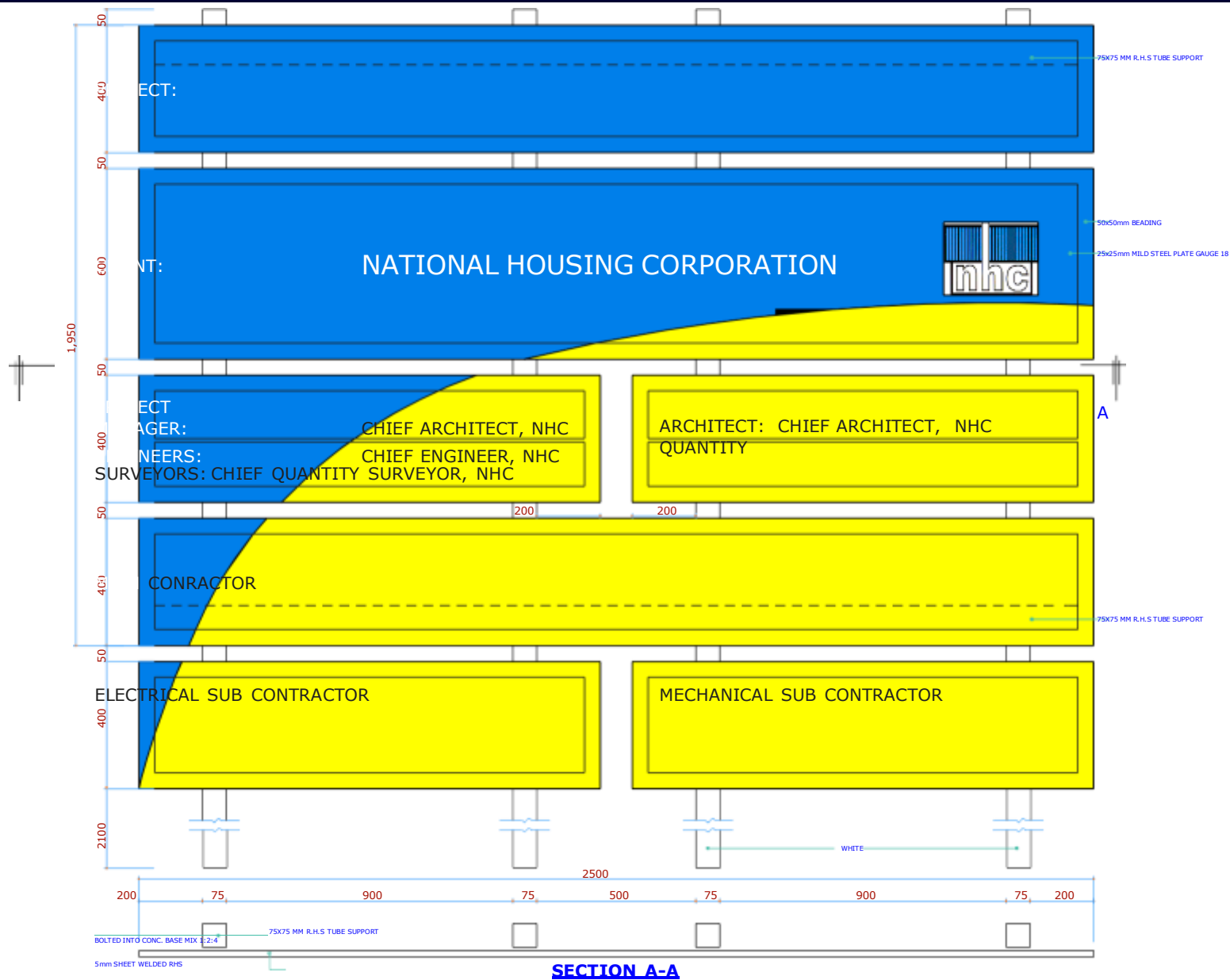
8. WATER RETICULATION

Water Reticulation site "A"

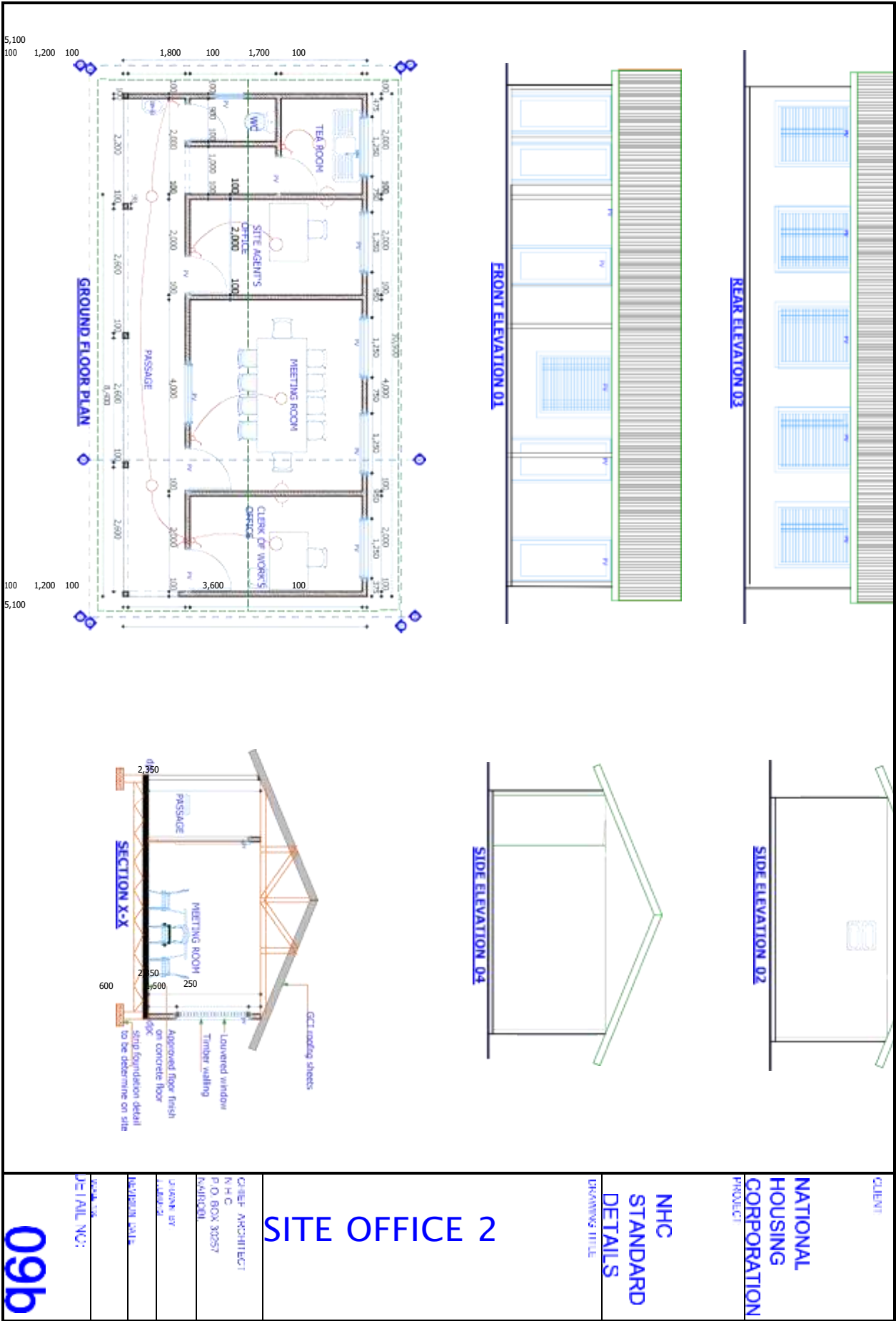
SECTION FIFTEEN APPENDIX

"B"

SIGN BOARD SITE OFFICE



REFERENCE DRAWINGS	
J. AWALLA	CHIEF ARCHITECT
R. AWALLA, R.A.A.A. (S)	
C. M. NYONGESA	PROJECT ARCHITECT
R. AWALLA, R.A.A.A. (S)	
Drawn by	FEB 2008
Checked by	
Approved	
CHIEF ARCHITECT NATIONAL HOUSING CORPORATION	
NATIONAL HOUSING CORPORATION P.O BOX 30257 NAIROBI.	
S.D. Title	
STANDARD DRAWING	
Drawing Title	
SIGN BOARD	
FILE No. NHC	
SCALE N.T.S	
Drawing No.110/49	



Amount of tender in words: Kenya Shillings.....
.....

Tenderer's signature and stamp.....

Address.....

Date..... Witness:

Name and signature.....

Address.....

Date.....

PART III - CONDITIONS OF CONTRACT AND CONTRACT FORMS

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 works** 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) **Equipment** 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** is 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

- 21 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.
- 22 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).
- 23 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 Quantities⁶, and
 - i) any other document **listed in the SCC** as forming part of the Contract.

⁶In lump sum contracts, delete “Bill of Quantities” and replace with “Activity Schedule.”

3. Language and Law

- 31 The language of the Contract is English Language and the law governing the Contract are the Laws of Kenya.
- 32 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

- 41 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

- 51 Otherwise **specified in the SCC**, the Project Manager may delegation his duties and responsibilities toother people, except to the Adjudicator, after notifying the Contractor, and may revoke any delegation after notifying the Contractor.

6. Communications

- 61 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

- 71 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

- 81 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

- 91 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.
- 92 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.
- 93 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

- 101 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 damaged
- 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,
 - orcc) 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
- 13.2 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.
- 13.3 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.
- 13.4 If the Contractor does not provide any of the policies and certificates required, the Procuring Entity may affect 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.
- 13.5 Alterations to the terms of an insurance shall not be made without the approval of the Project Manager.
- 13.6 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 availabilities 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

- 161 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

- 171 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Project Manager, for his approval.
- 172 The Contractor shall be responsible for design of Temporary Works.
- 173 The Project Manager's approval shall not alter the Contractor's responsibility for design of the Temporary Works.
- 174 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.
- 175 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

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

19. Discoveries

- 191 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

- 201 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

- 211 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

- 221 The Contractor shall carry out all instructions of the Project Manager which comply with the applicable laws where the Site is located.
- 222 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.
- 223 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 thesecond paragraph of this Sub-Clause 24.3.

242 Amicable Settlement

24.1.1 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.

243 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.

244 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.

245 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.

246 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.

247 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.

248 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 to the Contractor.

25. Fraud and Corruption

251 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.

252 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

261 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.

262 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.

- 263 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 continue 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.
- 264 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

- 271 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.
- 272 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

- 281 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.
- 282 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

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

30. Management Meetings

- 301 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.
- 302 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

- 311 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.
- 312 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

321 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

331 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

341 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.

342 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

351 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 Price⁷

361 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 Price⁸

371 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.

372 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

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

382 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.

383 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.

384 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.

⁷In 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.

⁸In 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.

⁹In lump sum contracts, add "and Activity Schedules" after "Programs." ¹⁰In lump sum contracts, delete this paragraph.

- 385 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning
- 386 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
- 387 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.
- 388 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 lifecycle 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.
- 389 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

- 391 When the Program¹¹, 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

- 401 The Contractor shall submit to the Project Manager monthly statements of the estimated value of the work executed less the cumulative amount certified previously.
- 402 The Project Manager shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor.
- 403 The value of work executed shall be determined by the Project Manager.
- 404 The value of work executed shall comprise the value of the quantities of work in the Bill of Quantities that have been completed¹².
- 405 The value of work executed shall include the valuation of Variations and Compensation Events.
- 406 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.

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

out during tender evaluation is worked out as follows: $(\text{corrected tender price} - \text{tender price}) / \text{tender price} \times 100$.

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 GCCSub-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 subcontract tablet.
- 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.

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."*

- 424 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

- 431 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 area result of GCC Clause 44.

44. Currency of Payment

- 441 All payments under the contract shall be made in Kenya Shillings

45. Price Adjustment

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

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

where:

P is the adjustment factor for the portion of

the Contract Price payable.

A and B are coefficients¹³ **specified in the SCC**, representing the non-adjustable and adjustable portions, respectively, of the Contract Price payable and I_m is the index prevailing at the end of the month being invoiced and I_o is the index prevailing 30 days before Bid opening for inputs payable.

- 452 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

- 461 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.
- 462 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

- 471 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.
- 472 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

- 481 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

- 491 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.
- 492 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.
- 493 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

- 501 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

- 511 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.
- 512 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.
- 513 The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.

52. Cost of Repairs

- 521 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

- 531 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

- 541 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

- 551 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.

¹³The 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. The sum of the adjustments for each currency are added to the Contract Price.

- 561 If “as built” Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the SCC.
- 562 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

- 571 The Procuring Entity or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.
- 572 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 or amalgamation;
 - 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.
- 573 Notwithstanding the above, the Procuring Entity may terminate the Contract for convenience.
- 574 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.
- 575 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 or not.

58. Payment upon Termination

- 581 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.
- 582 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

- 591 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.

- 60.1 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 was made.

SECTION IX - SPECIAL CONDITIONS OF CONTRACT

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 National Housing Corporation
GCC 1.1 (u)	The Intended Completion Date for the whole of the Works shall be 12 months from date of site Possession
GCC 1.1 (x)	The Project Manager is Chief Architects National Housing Corporation
GCC 1.1 (z)	The Site is located at Homabay County
GCC 1.1 (cc)	The Start Date shall be 14 days after site handing over
GCC 1.1 (gg)	The Works consist of Proposed Construction of Homabay Affordable Housing Project Phase One -Sector A. Homabay County
GCC 2.2	Sectional Completions are: N/A
GCC 5.1	The Project manager may delegate any of his duties and responsibilities.
GCC 8.1	Schedule of other contractors: None
GCC 9.1	<p>Key Personnel</p> <p>GCC 9.1 is replaced with the following:</p> <p>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.</p> <p>[insert the name/s of each Key Personnel agreed by the Procuring Entity prior to Contract signature.]</p>
GCC 13.1	<p>The minimum insurance amounts and deductibles shall be:</p> <p>(a) for loss or damage to the Works, Plant and Materials: : AS PER THE APPLICABLE LAWS IN KENYA</p> <p>(b) For loss or damage to Equipment: AS PER THE APPLICABLE LAWS IN KENYA</p> <p>(c) for loss or damage to property (except the Works, Plant, Materials, and Equipment) in connection with Contract AS PER THE APPLICABLE LAWS IN KENYA</p> <p>(d) for personal injury or death:</p> <p>of the Contractor's employees: AS PER THE APPLICABLE LAWS IN KENYA</p> <p>of other people: AS PER THE APPLICABLE LAWS IN KENYA</p>
GCC 14.1	Site Data are: The Site is located in Homabay County.
GCC 20.1	The Site Possession Date(s) shall be: immediately after signing the contract.

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
GCC 23.1 & GCC 23.2	Appointing Authority for the Adjudicator: Nairobi Centre for International Arbitration. Hourly rate and types of reimbursable expenses to be paid to the Adjudicator: to be determined guided by fees guidelines
B. Time Control	
GCC 26.1	The Contractor shall submit for approval a Program for the Works within 14 days from the date of the Letter of Acceptance.
GCC 26.3	The period between Program updates is Fourteen (14) days. The amount to be withheld for late submission of an updated Program is <i>[insert amount]</i> .
C. Quality Control	
GCC 34.1	The Defects Liability Period is: <i>180</i> 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: Not applicable
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 does not apply. The coefficients for adjustment of prices are: (a) percent nonadjustable element (coefficient A). (b) percent adjustable element (coefficient B). (c) The Index I for shall be.
GCC 46.1	The proportion of payments retained is: 10% of amount payable.
GCC 47.1	The liquidated damages for the whole of the Works are at the rate of Kshs. 20,000 per week. The maximum amount of liquidated damages for the whole of the Works is 10% of the final Contract Price.
GCC 49.1	The advance payments shall be: Up to 20% Percentage of the Accepted Contract Amount payable in the currencies and proportions in which the Accepted Contract Amount is payable. The amount of advance payment shall be secured by an equivalent Bank Guarantee from a reputable Bank Strictly Tier 1 (One)
GCC 50.1	The Performance Security amount is 10% of the Contract Amount. (a) Performance Security – Bank Guarantee: in the amount(s) of 10% percent of the Accepted Contract Amount and in the same currency(ies) of the Accepted Contract Amount from a reputable bank strictly Tier (1) One
E. Finishing the Contract	
GCC 56.1	The date by which operating and maintenance manuals are required is: Not Applicable The date by which “as built” drawings are required is : Not Applicable

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
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 : <i>Not Applicable</i>
GCC 57.2 (g)	The maximum number of days is: <i>365 days</i> .
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 <i>15%</i> .

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: *[insert the name of the Procuring Entity]*
- ii) Project: *[insert name of project]*
- iii) Contract title: *[insert the name of the contract]*
- iv) Country: *[insert country where ITT is issued]*
- 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 dead line to request a debriefing expires at midnight on *[insert date]* (local time).
- b) You may request a debriefing in relation to the results of the evaluation of your Tender. If you decide to request a debriefing your written request must be made within three (5) Business Days of receipt of this Notification of Intention to Award.
- c) Provide the contract name, reference number, name of the Tenderer, contact details; and address the request for debriefing as follows:
 - i) Attention: *[insert full name of person, if applicable]*
 - ii) Title/position: *[insert title/position]*
 - 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 toward.
 - ii) The complaint can only challenge the decision to award the contract.
 - iii) You must submit the complaint within the period stated above.
 - iv) You must include, in your complaint, all of the information required to support your complaint.

7. Standstill Period

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

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

Signature: _____ **Name:** _____

Title/position: _____ **Telephone:** _____ **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 ofdated the...day of20.....in the matter of Tender No.....of20..... for..... (Tender description).

REQUEST FOR REVIEW

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

- 1.
- 2.

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

- 1.
- 2.

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

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

SIGNED

Board Secretary

FORM NO 3: LETTER OF AWARD

[letterhead paper of the Procuring Entity] [date]

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

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

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*

