TENDER NO.UUT/02/2026: PROPOSED STUDENT HOSTELS

FOR

UMMA UNIVERSITY, KAJIADO.

TENDER DOCUMENT

Architect

Tectura International Ltd.
P. O. Box 54634 - 00200
NAIROBI

Quantity Surveyor

Makon Consultants
P. O. Box 24394 – 00100
NAIROBI

Civil and Structural Engineer

Professional Consultants Ltd.
P. O. Box 24996 - 00502
NAIROBI

Mechanical & Electrical Engineer

Norkun Intakes Ltd.
P. O. Box 605 – 00100
NAIROBI

MAY 2026

TENDER NO.UUT/02/2026: PROPOSED STUDENT HOSTELS FOR UMMA UNIVERSITY, KAJIADO

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MEASURED WORKS

INVITATION TO TENDER

TENDER NAME AND DESCRIPTION OF WORKS: PROPOSED CONSTRUCTION OF STUDENTS HOSTEL AT UMMA UNIVERSITY.

1. Umma University invites sealed tenders for the Proposed Construction.
2. Tendering will be conducted under appropriate procurement method selected by the procuring entity using a standardized tender document. Tendering is open to eligible, qualified and interested tenderers.
3. A complete set of tender documents may be downloaded at the university website umma.ac.ke at a cost of 10,000/= payable to KCB Bank account number 1198 158468. Payment receipt to be attached to the tender document.
4. Tenders shall be quoted be in Kenya Shillings and shall include all taxes. Tenders shall remain valid for (120) days from the date of opening of tenders.
5. All Tenders must be accompanied by a Tender Security (2% of Contract Value)
6. The Tenderer shall chronologically serialize all pages of the tender documents submitted.
7. Completed tender documents **MUST** be submitted to the University tender box at the reception main campus in Kajiado so as to be received by **23rd July 2026 at 11.00 am**
8. Tenders will be opened immediately after the deadline date and time specified above or any dead line date and time specified later. Tenders will be publicly opened in the presence of the Tenderers' designated representatives who choose to attend at the address below.
9. Late tenders will be rejected.
10. Mandatory pre-tender site visit: **17th June 2026 at umma university - kajiado main campus starting from 10.00 am**
11. Every bidder shall be physically represented by one technical person. The representative should produce a copy of National ID and an original letter (signed and stamped) from the company authorizing them to represent the company in the pretender site visit.
12. NOTE: Tenderer's name MUST be in the pre-tender site visit attendance register otherwise the site visit certificate will be disregarded.
13. The addresses referred to above are:

A. *Address for obtaining further information and for purchasing tender documents*

i. Name of Procuring Entity. **Umma University**

ii. Physical address for hand Courier Delivery to an office or Tender Box (City, Street Name, Building, Floor Number and Room). Kajiado along Namanga Road.

iii. Postal Address 713-01100 Kajiado

B. Name, telephone number and e-mail address of the officer to be contacted.

procurement@umma.ac.ke, Tel. 0746790207

C. Address for Submission and Opening of Tenders.

i. Name of Procuring Entity. Umma University
ii. Postal Address: Vice Chancellor P.O. Box 713-01100 KAJIADO
iii. Physical address for hand Courier Delivery to an office or Tender Box (City, Street Name, Building, Floor Number and Room). Kajiado Main Campus, along Nairobi Namanga Road.

PART 1: TENDERING PROCEDURES

INSTRUCTIONS TO TENDERERS

A. *GENERAL PROVISIONS*

1. *Scope of tender*

a) The Procuring Entity invites tenders for Works Contract as described in the tender document. The name, identification, and number of lots (contracts) of this Tender Document are as specified.

b) Throughout this tendering document:

i) The term "in writing" means communicated in written form (e.g. by mail, e-mail, fax, including if specified, distributed or received through the electronic-procurement system used by the Procuring Entity) with proof of receipt;

ii) if the context so requires, "singular" means "plural" and vice versa;

iii) "Day" means calendar day, unless otherwise specified as "Business Day". A Business Day is any day that is an official working day of the Procuring Entity. It excludes official public holidays.

2. *Fraud and corruption*

a) The Procuring Entity requires compliance with the provisions of the policy, rules and procedures of Umma University. 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 in Kenya.

b) Tenderers shall permit and shall cause their agents (whether declared or not), subcontractors, sub-consultants, service providers, suppliers, and their personnel, to permit the Procuring Entity to inspect all accounts, records and other documents relating to any initial selection process, pre-qualification process, tender submission, proposal submission, and contract performance (in the case of award), and to have them audited by auditors appointed by the Procuring Entity.

c) 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 and make available to all the firms together with this tender document all in formation that would in that respect give such firm any unfair competitive advantage over competing firms.

3. *Eligible tenderers*

a) A Tenderer may be a firm that is a private entity, a state-owned enterprise or institution or an individual or any combination of such entities in the form of a joint venture (JV) under an existing agree mentor with the intent to enter in to such an agreement supported by a letter of intent. In the case of a joint venture, all members shall be jointly and severally liable for the execution of the entire Contract in accordance with the Contract terms. The JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the members of the JV during the tendering process and, in the event the JV is awarded the Contract, during contract execution. Members of a joint venture may not also make an individual tender, be a subcontractor in a separate tender or be part of another joint venture for the purposes of the same Tender. The maximum number of JV members shall be not more than 3 members**.**

b) Staff of Umma University, 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.

c) 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:

d) Directly or indirectly controls, is controlled by or is under common control with another tenderer;

i) Receives or has received any director indirect subsidy from another tenderer;

ii) Has the same legal representative as another tenderer;

iii) 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;

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

v) Any of its affiliates has been hired (or is proposed to be hired) by the Procuring Entity as a consultant for Contract implementation;

vi) 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;

vii) Has a close business or personal relationship with senior management or professional staff of the Procuring Entity who has the ability to influence the bidding process and:

viii) 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

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

e) A tenderer shall not be involved in corrupt, coercive, obstructive or fraudulent practice.

f) A tenderer that is proven to have been involved in any of these practices shall be automatically disqualified

4. *Eligible goods, equipment, and services*

a) Goods, equipment and services to be supplied under the Contract may have their origin in any country that is not ineligible. At the Procuring Entity's request, Tenderers may be required to provide evidence of the origin of Goods, equipment and services.

b) 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*

A. 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.

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

C. 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 again stall liability arising from death or personal injury, loss of or damage to property, and any other losses and expenses

incurred as a result of the examination and inspection. The tenderer shall provide in the Form of Tender, a preliminary description of the proposed work method and schedule, including charts, as necessary or required.

D. *CONTENTS OF TENDER DOCUMENTS*

Section I – Instructions to Tenderers

Section II - Evaluation and Qualification Criteria

Section III – Forms of Tender

Section IV – Bills of Quantities

Section V – Drawings

Section VI- Specifications

6. *Clarification of Tender Document, Site Visit, Pre-tender Meeting*

a) A Tenderer requiring any clarification of the Tender Document shall contact the Procuring Entity in writing at the Procuring Entity's address specified herein to raise its enquiries during the tendering progress. The Procuring Entity will respond in writing to any request for clarification, provided that such request is received no later than 3 days 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, including a description of the inquiry but without identifying its source. If so specified the Procuring Entity shall also promptly publish its response at the web page identified. Should the clarification result in changes to the essential elements of the Tender Documents, the Procuring Entity shall amend the Tender Documents.

7. *Amendment of Tender Documents*

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

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

c) To give Tenderers reasonable time in which to take an addendum into account in

preparing their Tenders, the Procuring Entity should extend the dead line for the submission of Tenders and communicate the same appropriately.

B. ***PREPARATION OF TENDERS***

8. Cost of Tendering

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

9. Language of Tender

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

10. Tender Prices and Discounts

a) 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 of the tender.

b) 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.

c) The price to be quoted in the Form of Tender shall be the total price of the Tender, including any discounts offered.

11. *Currencies of Tender and Payment*

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

b) 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.

c) A Tenderer expecting to incur expenditures in other currencies for inputs to the Works supplied from outside Kenya (referred to as "the foreign currency requirements") shall indicate the Tender Price (excluding Provisional Sums), needed by the Tenderer for the payment of such foreign currency requirements, limited to no more than two foreign currencies.

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

12. *Period of Validity of Tenders*

a) Tenders shall remain valid for the Tender Validity period of 120 days. The Tender Validity period starts from the date fixed for the Tender submission deadline. A tender valid for a shorter period shall be rejected by the Procuring Entity as non-responsive.

b) 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, 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.

13. *Tender Security*

a) The Tenderer shall furnish as part of its Tender, a Tender Security as specified in the Initiation to Tender Notice in original form.

b) The Tender Securities of unsuccessful tenderers will be returned within 28 days of the end of the tender validity period

c) The Tender Security of the successful tenderer will be discharged when the tenderer

has signed the Contract Agreement and furnished the required Performance Bond.

d) The Tender Security may be forfeited

i) if the tenderer withdraws the tender after tender opening during the period of tender validity;

ii) if the tenderer does not accept the correction of the tender price.

iii) in the case of a successful tenderer, if the tenderer fails within the specified time limit to sign the Agreement, or furnish the required Performance Bond.

C. SUBMISSION AND OPENING OF TENDERS

14. Sealing and Marking of Tenders

a) 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:

b) in an envelope or package or container marked "ORIGINAL", all documents comprising the Tender.

c) in an envelope or package or container marked "COPIES", all required copies of the Tender. The inner envelopes or packages or containers shall: bear the name and address of the Procuring Entity, bear the name and address of the Tenderer; and bear the name and Reference number of the Tender.

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

15. Deadline for Submission of Tenders

a) Tenders must be received by the Procuring Entity at the address specified and no later than the date and time as specified**.** When so specified tenderers shall have the option of submitting their Tenders electronically.

b) The Procuring Entity may, at its discretion, extend the deadline for the submission of Tenders by amending the Tender Documents 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.

16. Late Tenders

The Procuring Entity shall not consider any Tender that arrives after the deadline for submission of tenders. 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.

17. Withdrawal, Substitution, and Modification of Tenders

a) 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 (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:

b) 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.

18. Tender Opening

a) The Procuring Entity shall publicly open and read out all Tenders received by the deadline, at the date, time and place specified herein in the presence of Tenderers' designated representatives who chooses to attend.

b) 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.

D. EVALUATION AND COMPARISON OF TENDERS

19. Evaluation of tenders shall entail three stages, preliminary, technical and financial evaluation.

1. Clarification of Tenders

a) 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.

b) 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.

2. Determination of Responsiveness

a) The Procuring Entity's determination of a Tender's responsiveness is to be based on the contents of the tender itself as per the evaluation criteria in SECTION II.

3. Arithmetical Errors

a) Provided that the Tender is substantially responsive, the Procuring Entity shall handle errors on the following basis:

i. 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.

ii. 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

iii. If there is a discrepancy between words and figures, the amount in words shall prevail.

iv. If it is found on examination of a tender that there is any discrepancy between the total amount of the tender and the amount arrived at by valuing the items set out in the Bills of Quantities at the rates or prices set against them by the tenderer, then the figure shall be corrected arithmetically and the adjusted price shall be the contract sum.

v. The rates so adjusted become the contract rates and shall apply as provided for in variations.

vi. If it found on examination that any rates for the work appear to be unreasonable then the attention of the tenderer shall be drawn to any such items: if as result of this tenderer asks for any rates to be changed then the arithmetical effect of any change will be adjusted in accordance with sub-paragraph (i) above.

vii. Any discount the tenderer may wish to give shall be treated as a discrepancy in accordance with sub-paragraph (i) above.

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

4. Currency provisions

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

5. Nominated Subcontractors

a) Unless otherwise stated the Procuring Entity does not intend to execute any specific elements of the Works by subcontractors selected in advance by the Procuring Entity.
b) Tenderers may propose subcontracting up to the percentage of total value of contracts or the volume of works as specified. Subcontractors proposed by the Tenderer shall be fully qualified for their parts of the Works.
c) 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 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.

6. Comparison of Tenders

a) The Procuring Entity shall compare the evaluated costs of all substantially responsive Tenders established to determine the Tender that has the lowest evaluated cost.

7. Best Evaluated Tender

a) 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:
   i. Most responsive to the Tender document; and
   ii. the lowest evaluated price.

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

a) 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.

9. Award Criteria

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

10. Notice of Intention to enter into a Contract

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

i. the name and address of the Tenderer submitting the successful tender;
ii. the Contract price of the successful tender;
iii. 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;
iv. the expiry date of the Standstill Period; and
v. instructions on how to request a debriefing and/or submit a complaint during the standstill period;

11. Debriefing by the Procuring Entity

a) On receipt of the Procuring Entity's Notification of Intention to Enter into a Contract, 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.

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

12. Signing of Contract

a) As specified in the Notification of Intention to enter into contract, the Procuring Entity shall send the successful Tenderer the Contract Agreement.

TENDER EVALUATION CRITERIA: PROPOSED STUDENT HOSTELS FOR UMMA UNIVERSITY

3.0 EVALUATION

A responsive bid is one that conforms to the stipulated tendering procedures and also reflects as closely as possible, the actual scope of the task to be performed. The following criteria shall be used as indicators of responsiveness:

a) Completion of the tender document
b) Submission of all mandatory requirements
c) Responsiveness of the technical evaluation criteria
d) Consistency and accuracy in pricing including arithmetic correctness

3.0.1 EVALUATION STAGES OVERVIEW

TABLE 1: STAGES OVERVIEW

STAGES	STAGE NAME	BASIS	PASS MARK
1	PRELIMINARY EVALUATION	Pass/Fail	All mandatory items
2	TECHNICAL EVALUATION	Marks out of 100	70% (70 out of 100)
3	FINANCIAL EVALUATION	Cost Analysis	Lowest evaluated cost

3.0.2 Preliminary Evaluation

All submitted tenders shall be reviewed to determine whether they meet the mandatory requirements outlined in the tender advertisement. ***Refer to Table below for details*** : -

TABLE 2: PRELIMINARY EVALUATION FOR MANDATORY REQUIREMENTS

ITEM	MANDATORY REQUIREMENT	EVALUATION
1	**Number of tender Submitted**	
2	**Tender properly signed** a) Form of Tender Signed	Pass/Fail
3	**Bid Security** a) Provided by which company b) Amount of Security c) Tender amount d) Percentage	Pass/Fail
4	**NCA registration** a) Certificate attached	Pass/Fail

	b) Category	
5	**Other Documents required** a) VAT certificate b) Pin certificate c) Valid TAX compliance certificate d) Certificate for incorporation e) CR12 or its equivalent (for foreign companies) f) Proof of physical address g) Pre-tender site visit certificate h) Payment receipt for purchase of tender document i) Catalogues for equipment j) Business permit	Pass/Fail
QUALIFIED FOR TECHNICAL EVALUATION		**Yes/No**

Note: Only bids that meet all the mandatory requirements shall proceed to the technical evaluation stage.

3.0.3 Technical Evaluation

Tenders that meet all the mandatory requirements will be assessed to determine whether they comply with the technical requirements specified in the tender advertisement. ***Refer to Table 3 below for details:*** -

TABLE 3: TECHNICAL EVALUATION

ITEM	DESCRIPTION	MARKS TO BE AWARDED
1	**Annual volume of construction work of at least 2.5 times the estimated annual cashflow for the Contract.**	15 MARKS
2	**Experience of the main contractor in three works of similar nature and volume over the last ten years (Two Works cited should be 100% complete). Attach name of the client/contact person, award sums, final account sums, award letters and completion certificates (if completed)** a) More than three similar works (two works 100% complete)	10 MARKS

	b) Three similar works (two works 100% complete) c) Less than three similar works	7 MARKS 0 MARK
3	**Qualification and Experience of Key Personnel such as Directors of the firm, project managers, site agents/foremen, site safety officer etc** a) Directors of the firm. Attach CV and to have at least 10 years of experience b) Project Manager/Quantity Surveyor. Attach CV and to have at least 5 years of experience c) Site Agents/Foremen. Attach CV and to have at least 5 years of experience d) Occupational Health and Safety Officer. Attach CV and to have at least 5 years of experience	 5 MARKS 5 MARKS 5 MARKS 2 MARKS
4	**Financial capability; Analysis of audited financial statements in the last five years** a) Average annual turnover equal or greater than the expected turnover of the bid sum b) Average annual turnover above 50% but below 100% of the expected turnover of the bid sum c) Average annual turnover greater than 25% and below 50% of the expected turnover of the bid s d) Average annual turnover less than 25% of the expected turnover of the bid sum	 10 MARKS 5 MARKS 3 MARKS 0 MARKS
5	**Evidence of Financial Resources; cash at hand, lines of credit, overdraft facility etc** a) Has financial resources to finance the projected monthly cash flow for 3 months b) Has financial resources to finance the projected monthly cash flow for 2 months minimum c) Has financial resources to finance the projected equal to the projected monthly cash flow d) Has financial resources to finance the projected less than the projected monthly cash flow	 10 MARKS 5 MARKS 3 MARKS 0 MARKS
6	**Adequacy of tools and equipment; proof of ownership or leasing** a) At least more than two site vehicles/tippers b) At least more than two concrete vibrator sets c) At least more than one hoisting equipment/crane d) At least more than two concrete mixers (more than or equal to 500 litres capacity) e) Sufficient scaffolding	10 MARKS
7	**Proposed program (work method and schedule) for the whole of the works** Milestones indicated on the program of works shall be adopted as key reference points during supervision and monitoring of the project to track progress and ensure timely completion to the winning bidder. In accordance with clause 18.1 of the JBC Agreement and Conditions of Contract, the contractor shall submit a programme of works to the Architect for approval within fourteen (14) after the date of the award letter, in such form and detail as the Architect shall reasonably prescribe.	5 MARKS
TOTAL MARKS		

Note: Only bids that score 70% and above in the technical evaluation shall proceeed to the financial evaluation stage.

3.0.4 Financial Evaluation

Tender sums submitted by bidders who attain a score of 70% and above in the technical evaluation stage shall be analysed. **Refer to *Table 4 below for details:* -**

TABLE 4: COSTS ANALYSIS

	EVALUATION	
	QS ESTIMATE	**TENDERER**
Tender sum		
Number of the tenderer before Analysis		
Difference from the QS Estimate		
Percentage Difference from the QS Estimate		
Corrected Figure (After Analysis)		
Error		
Percentage Error		

3.0.5 Award Recommendation

Award shall be made to the bidder with the highest combined score (quality-cost). **Refer to *Table 5 below for details:* -**

TABLE 5: AWARD ANALYSIS

TENDERER	**TECHNICAL SCORE (/100)**	**TENDER SUM (KSH)**	**FINANCIAL SCORE(/100)**	**COMBINED SCORE (70% TECHNICAL SCORE + 30% FINANCIAL SCORE**
Note:	Technical score=70% weight, Financial score=30% weight and the combined score= Technical Score+Financial Score			

FORM OF TENDER

PROPOSED STUDENT HOSTELS FOR UMMA UNIVERSITY, KAJIADO

TO: UMMA UNIVERSITY
P.O. BOX 713-01100
KAJIADO.

In accordance with the Bills of Quantities and Drawings referred to therein

I/We: ..... (Tenderer's Name)

Under and subject to the Conditions of Tendering hereinafter, hereby tender and offer to execute and perform the works and provisions and supply all labour and materials and everything of every kind respectively named, shown, described and alluded to in, or to be inferred from the Articles of Agreement, Conditions of Contract, Bills of Quantities and Drawings to be executed and supplied on the part of the contract for the works described hereinafter in conformity with the said Bills of Quantities and Drawings and under and subject to the said conditions of Contracts for the lump sum named herein. The undersigned agrees to be bound and submit to the said Conditions of Contract, and priced Bills of Quantities which shall form the basis for the valuation of interim certificates and any extra or omitted work which may from time to time be ordered by the Architect.

And further, the undersigned agrees to complete the whole of the works within ---------- -------- weeks from the date of commencement or within such extended time as the conditions of Contract provided.

The total amount of this tender in accordance with the Bills of Quantities including all Prime Costs and Provisional Sums and allowing for all costs is the lump sum of:

Shillings (in words) .....

.....

i.e., Kshs. ..... (In figures)

(FORM OF TENDER)

Whereas it is understood that you reserve to yourselves the right to reject this tender whether it be lower or higher than any other tender or of the same amount, the undersigned agrees that this tender shall remain valid and shall not be withdrawn before the expiry of Ninety (90) days from the date for submission of tenders stipulated in the Conditions of Tendering.

And further, the undersigned agrees, in the event of your acceptance of this tender, to execute the formal Contract Agreement within a reasonable period from posting or delivery, if by hand, of notification of acceptance. Unless and until a formal Agreement is executed, we further agree that this tender, together with your written acceptance thereof shall constitute a binding contract between us.

Signature of Tenderer .....

Address

.....

Date .....

Witness to Signature
of Tenderer .....

Address

.....

Date .....

FORM OF TENDER SECURITY

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

KNOW ALL PEOPLE by these presents that WE …… having our registered office at …… (hereinafter called "the Bank"), are bound unto …… (hereinafter called "the Employer") in the sum of Kshs.…… for which payment well and truly to be made to the said Employer, the Bank binds itself, its successors and assigns by these presents sealed with the Common Seal of the said Bank this ……. Day of ……20……

THE CONDITIONS of this obligation are:

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

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

   (a) fails or refuses to execute the form of Agreement in accordance with the Instructions to Tenderers, if required; or
   (b) fails or refuses to furnish the Performance Bond, in accordance with the Instructions to Tenderers.

   We undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by

him is due to him, owing to the occurrence of one or both of the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to and including thirty (30) days after the period of tender validity, and any demand in respect thereof should reach the Bank not later than the said date.

_____

[date] *[signature of the Bank]*

_____

[witness] *[seal]*

CONTRACTOR'S SURETY UNDERTAKING

UMMA UNIVERSITY
P.O. BOX 713-01100
KAJIADO.

TENDER FOR PROPOSED STUDENT HOSTELS FOR UMMA UNIVERSITY, KAJIADO

I/We .....

of .....

am/are willing to act as Surety and to be bound to you in the sum equal to Ten per Centum (10%) of the Contract amount, for the due performance by

.....…… ……(Tenderer)

of a contract which he/they contemplate(s) entering into with you for the erection and completion of the above works according to the terms of the Form of Bond, a copy of which has been inspected by us, without the addition of any limitations.

We further agree that this Surety Undertaking shall remain valid for Ninety (90) days or such extended time as agreed in writing by the tenderer, from the final date of submission of the tender of which this document forms a part.

We agree to enter into a Bond under the above terms within seven days of being called upon to do so.

.....…… ...…… (Surety)

.....……(Date)

.....……(Witness)

……..(**STAMP)**

TENDER FOR PROPOSED STUDENT HOSTELS FOR UMMA UNIVERSITY, KAJIADO

FORM OF CONTRACTOR'S PERFORMANCE BOND

To be used with Agreement and Conditions of Contract for Building Works

BY THIS AGREEMENT,we……..……(**SURETY**)

of.....….....
.
are bound to .....…….……. **(EMPLOYER)**

in the sum of Kenya Shillings .....….....……

.....…… (Kshs.....….....)

to be paid by us to the said .....…….....… **(EMPLOYER)**

WHEREAS by an agreement in writing dated
……

……..… **(CONTRACTOR)**

entered into contract with ……**(EMPLOYER)**
to carry out and complete the works therein stated in the manner and by the time therein specified all in accordance with the provisions of the said contract, namely; (description of the works)

……
……
……..…

NOW the condition of the above written bond is such that if the said Contractor his executors, administrators, successors or assigns shall duly perform his obligations under the contract, or if on default by the Contractor the surety shall satisfy and discharge the damages sustained by the Employer thereby up to the amount of the above written bond, then this bond shall be void, otherwise it shall remain in full force and effect. Upon default, and without prejudice to his other rights under the contract, the Employer shall be entitled to demand forfeiture of the bond and we undertake to honour the demand in the amount stated above.

PROVIDED always and it is hereby agreed and declared that no alteration in the terms of this contact or in the extent or nature of the works to be carried out and no extension of time by the Architect under the contract shall in anyway release the Surety from any liability under the above written bond.

IN WITNESS whereof we have set our hands this …….. day of

……..

....

SURETY **WITNESS**

Authority by Power of Attorney

No. .....

TENDER NO.UUT/02/2026: PROPOSED STUDENT HOSTELS FOR UMMA UNIVERSITY, KAJIADO

SIGNATURE PAGE

These Bills of Quantities are supplied as part of the contract for the PROPOSED STUDENT HOSTELS FOR UMMA UNIVERSITY, KAJIADO

Prepared by : **Makon Consultants,**
Quantity Surveyors, Building Economists and Project Managers,
P. O. Box 24394 - 00100
NAIROBI.

The contract for the above-mentioned works executed on the ……..... day of ..... 2026 by the undersigned parties refers to these Bills of Quantities consisting of those pages numbered on page (i) and those drawings to be supplied as Contract documents, which shall be read and construed as part of the said contract.

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(CONTRACTOR) **(EMPLOYER)**

BILL No. 1

PRELIMINARIES AND GENERAL CONDITIONS

ITEM NO		KShs.	Cts.
	BILL NO.1		
	PRELIMINARIES AND GENERAL CONDITIONS		
A.	**NAME OF PARTIES**		
	The following names will be inserted in the Articles of Agreement:-		
	The Employer — Umma University, P.O.Box 713-01100, Kajiado.		
	The Architect — Tectura International Ltd., P. O. Box 54634-00200, Nairobi		
	The Quantity Surveyor — Makon Consultants, P. O. Box 24394-00100, Nairobi		
B.	**DEFINITION OF TERMS**		
	Terms, phrases and abbreviations shall be deemed to have the following meanings wherever used hereinafter and in all contract documents.		
	Structural Engineer' for this project shall be Professional Consultants Ltd P.O BOX 24996 - 00502, Nairobi or incase of his death or ceasing to be the Structural Engineer for the purposes of this contract, such other person as the employer shall nominate for that purpose. For the purpose of structural work, the Enginner shall be deemed vested with the duties of and be the representative of the Architect, except in respect in variations which involve the contract sum.		
	Mechanical Engineer' for this project shall be Norkun Intakes Ltd P.O. BOX 605 – 00100, Nairobi or incase of his death or ceasing to be the Mechanical Engineer for the purposes of this contract, such other person as the employer shall nominate for that purpose. For the purpose of Mechanical Engineering work, the Engineer shall be deemed vested with the duties of and be the representative of the Architect, except in respect in variations which involve the contract sum.		
	Electrical Engineer' for this project shall be Norkun Intakes Ltd P.O. BOX 605 – 00100, Nairobi or incase of his death or ceasing to be the Electrical Engineer for the purposes of this contract, such other person as the employer shall nominate for that purpose. For the purpose of Electrical Engineering work, the Engineer shall be deemed vested with the duties of and be the representative of the Architect, except in respect in variations which involve the contract sum.		
	Contractor' shall mean the party who shall have signed this contract and shall include his or their heirs, executors, adminstrators, assigns, successors and duly appointed representatives.		
	Shs.		

ITEM NO		Shs.	Cts.
	Works' shall mean all or any portion of the work, materials or articles, wherever the same are being manufactured or prepared, which are to be used in the execution of this contract and whether the same maybe on the site or not. Approved' shall mean approved by the Architect at his absolute discretion. Directed' shall mean approved by the Architect at his absolute discretion. Selected' shall mean approved by the Architect at his absolute discretion. m3' or 'cm' shall mean cubic metre. m2' or 'sm' shall mean square metre. m' or 'lm' shall mean linear metre. mm' shall mean linear millimetre. Kg' shall mean Kilogramme. N' shall mean Newton. KN' shall mean Kilonewton. No' shall mean Number. Prs' shall mean Pairs. m/s' shall mean measured separately. B.S. ' shall mean the current British Starndard Specification published by the British Starndards Intitution, 2 Park Street, London, W.I., England. K.S. ' shall mean the current Kenya Standard Specification published by the Kenya Bureau of Standards, P. O. Box 54974, NAIROBI. Fix Only ' shall mean take delivery in Nairobi (Unless otherwise stated) , pay all demurrage and transport charges, load and transport to site where necessary, unload, store, unpack, check contents against orders and packing lists, assemble as necessary, distribute to position , hoist and fix only.		
B.	**DESCRIPTION OF SITE** The site of the proposed works is on UMMA UNIVERSITY, KAJIADO. The Contractor is recommended to visit the site and if unable to locate it, to apply to the Architect for directions. The Contractor will be deemed to have satisfied himself with regard to the conditions of the existing constructions thereon, the risk of injury and damage to the existing property and property adjacent to the site or to the occupiers of such property, the nature of the materials to be excavated and conditions under which the works will have to be carried out, the supply of and conditions affecting labour and the facilities for obtaining the articles or materials referred to in the Bills of Quantities. No claim by the Contractor for additional payment will be allowed on the ground of any misunderstanding or misapprehension in respect of any such matter or otherwise. Any damage caused to existing accesses and roads must be made good as directed by and to the approval of the Architect.		
	Shs.		

ITEM NO		Shs.	Cts.
A.	**DESCRIPTION OF THE WORKS.** The contract comprises the following:- 1. Construction of 2 No. Student Hostel Blocks constructed of reinforced concrete frames comprising of suspended ground floor slab with ground beams, columns, suspended solid slabs, beams and flat roof. External walls and internal walls consist of machine cut stone walling finished with permaplast paint. Floor finishes comprise ceramic tiles with ceramic tile skirting. Windows are of aluminium construction and doors are of mild steel construction with glazing and timber doors with timber frames. Ceilings finished with plastered paint. 2. The requisite electrical, plumbing and drainage installations. 3 External works include paved areas, foul drainage, stormwater drainage, water reticulation and the like.		
B.	**AREA TO BE OCCUPIED BY THE CONTRACTOR** The area of the site which may be occupied by the Contractor for use of storage or for the erection of workshops, etc., shall be defined on the site by the Architect so as to cause as little inconvinience as possible to the facility.		
C.	**ACCESS TO SITE** Means of access to site through the existing entrances shall be agreed with the Architect prior to the commencement of work and the contractor must allow here for any temporary access roads required for the transport of all materials, plants and the workmen necessary for the complete execution of the works including the provision of temporary culverts, crossing, bridges or any other means of gaining access to the site, removing same at completion and making good and reinstating to the entire satisfaction of the Architect all works and services disturbed at the completion of the contract. The Contractor must also allow for keeping the existing public highways and roads clean and for making good all damage to the satisfaction of the Architect and Local Authority.		
D.	**DRAWINGS** The Contractor will be deemed to have examined all the drawings from all the consultants before tendering and to have satisfied himself regarding their details, nature and extent of works and the method of construction involved. No claims arising out of the misapprehension in these respect shall be allowed. Drawings may be examined by appointment at the offices of the Architect during normal working hours.		
E.	**NOMINATED SUPPLIERS AND SUB-CONTRACTORS MATERIALS** Nominated Sub-Contracts and Supply Agreements will be finalised as soon as possible after the contract has been signed. The Contractor will be deemed to have taken into account of this in his allowance for the provision of space for storage of Nominated Sub-Contractors' materials and for the provision of storage facilities on or off site for Nominated Suppliers' materials until required.		
	Shs.	-	

ITEM NO		Shs.	Cts.
A.	**BLASTING** Blasting will not be allowed.		
B.	**VALUATION OF LUMPSUM PRELIMINARIES COSTS** Lumpsums entered in this Bills of Quantities against any item of General Conditions or Preliminaries will be included in appropriate valuations according to reasonable assessment of actual costs involved in the item. Any balance between this assessment and the actual sum entered in the Bills of Quantities will be included in subsequent valuations as monthly instalments over the balance of the Contract period.		
C.	**CONTRACT AGREEMENT AND CONDITIONS** The Form of Contract shall be the Architectural Association of Kenya's Agreement and Conditions of Contract for Building Works, April 1999 Edition, herein referred to as the Agreement as particularly noted or ammended hereunder. A copy of the Agreement, Form of Bond and the Drawings may be viewed with arrangement of the Architect on any working day until the time appointed for the submission of tenders. For purposes of this contract the said schedule of conditions and any such notes or ammendments shall be read and construed together. The clause headings of the schedule of condtions are set out hereunder but do not in any way affect or restrict the full meaning of the Conditions as printed nor exempt the contractor from detailed examination of them. Notes on ammendments to the Conditions are set out under the relevant clause headings and after proper examination the Contractor must allow here under or in his prices such sum or sums as he may consider necessary in respect in any or all of the clauses of the conditions and of the said notes and amendments. **Clause No.** 1.0 Definitions 2.0 Articles of Agreement 3.0 General obligations of the Employer 4.0 General obligations of the Contractor 5.0 General obligations of the Architect 6.0 General obligations of the Quantity Surveyor 7.0 Contract documents 8.0 Contract bills and contract price These Bills of Quantities shall be deemed to generally follow principles laid down in the Standard Method of Measurement of Building Works 2008, 2nd Edition, published by the Architectural Association of Kenya, with the following exceptions:-		
	Shs.		

ITEM NO		Shs.	Cts.
	(a) Clause B 20 (b) of the Standard Method of Measurement is deleted and the following clause substituted: Attendance on nominated sub-contractors shall be given as an item in each case and shall be deemed to include allowing use of standing scaffolding, messrooms, sanitary accommodation and welfare facilities; providing space for office accommodation and for storage of plant and materials; providing light and water for their work; clearing away rubbish; unloading facilities for storage (as specified under "Storage of Material" in these Preliminaries) hoisting, providing water and power (as specified under "water and Electricity Supply for the Works" in these Preliminaries) and removing and replacing duct covers, pipe casings and the like necessary for the execution and testing of Sub-Contractor's work; providing templates, dimensions and supervision, for the proper carrying out of the Sub-Contractor's work and being responsible for the accuracy of the same. (b) Clauses D 18 (a) and (b) of the Standard of Method of Measurement are deleted and the following clause is substituted: Keeping excavations free from all water including spring and running water shall be given as an item in the preliminaries (c) Clause D 19 of the Standard Method of Measurement. The last sentence which reads: "and shall be given as an item or shall be included in the description of excavation" shall be deleted and the following substituted: "and shall be deemed to be included in the description of all items of excavation." In certain cases in this Bills of Quantities the Contractor maybe required to quote all inclusive composite unit prices for groups of items or elements of the works. Such composite unit prices shall be used for the adjustment of variations in the relevant section of the works. Any unauthorised alteration or qualification made to the text of the Bills of Quantities may cause the Tender to be disqualified and will in any case be ignored. The Contractor shall be deemed to have made allowance in his prices generally to cover any items of Preliminaries, expenses in connection to P.C. Sums or other items, if these have not been priced against the respective items. The Bills of Quantities shall under no circumstance be used for the purpose of ordering materials. Quantities given as 'Provisional' or 'All Provisional' in these bills shall be held neither to gauge nor limit the amount or description of the work to be executed by the Contractor but the values thereof shall be deducted from the Contract Sum and the value of the work ordered by the Architect and executed thereunder shall be ascertained as provided by clause 30 of the Conditions. The preamble clauses or headings to any Bill, Element, Section or Sub-Section are to apply equally to all Bills, Elements, Sectons or Sub-Sections. Shs.		

ITEM NO		Shs.	Cts.
	All items of the measured work shall be priced in detail and tenders containing lump sums to cover trades or groups of work must be broken down to show the price of each item before they will be accepted, unless the work has been so measured. Lump sums to cover any items of preliminaries shall also be broken down if so required. Wherever in the Contractor's priced Bills of Quantities no price appears against an item of Preliminaries, Preambles or in the measured works throughout the bills of quantities, the value of such item shall be deemed to be included in his prices for other items in the Bills of Quantities. 9.0 Contract's site agent and other staff 10.0 Clerk of Works 11.0 Liability against injury to person and property Note: The Contractor shall allow for maintaining adequate insurance cover for any one accident or series of accidents arising out of any one event (unlimited in aggregate) and shall cause any Sub- Contractor to maintain proportionate cover to cover their respective liabilities in respect of injury or damage to property real or personal arising out of or in the course of or by reason of the carrying out of the works and caused by any negligence, omission or default of the Contractor, his servants or agents, or, as the case maybe of such sub-contractor, his servants or agents. 12.0 Insurance against injury to persons and property 13.0 Insurance of the Works (Contractor's liability) 14.0 Insurance of the Works (Employer's liability) Note: This clause is to be deleted. 15.0 Insurance of the Works (Works of alterations etc.) Note: This clause is to be deleted. 16.0 Performance bond Note: The Contractor must submit with his Tender the name of one Surety who shall be an established Bank, Insurance Company or Fidelity Guarantee Corpopration who will be willing to be bound to the Employer for an amount equal to ten percent of the contract amount for the due performance of the contract up to date defined by clause 16 of the conditions and who will, when and if called upon, sign a Bond to that effect on the same day as the contract agreement is signed. In the event of the Surety named in the Form of Tender not being approved by the Employer, the Contractor shall furnish within seven days another surety to the approval of the Employer. Clause 16.2 is to be deleted. 17.0 Compliance with regulations, notice, etc. Shs.		

ITEM NO		Shs.	Cts.
	Note : The contractor shall allow for paying all legally demandable fees, charges, rates or taxes including VAT, including those for temporary buildings and no adjustment of the contract sum shall be made in repect to such payments unless expressly stated to the contrary in these Bills of Quantities. The Contractor for shall apply for, provide all transport necessary for, and pay all costs and charges in connection with the Occupation Certificate. Documentation required for such certificates will be provided by the Architect. 18.0 Programme of Works 19.0 Access to the Works 20.0 Possession of site and commencement of Works 21.0 Leveling and setting out 22.0 Architect's Instructions 23.0 Specifications of goods, materials and workmanship Note : All materials, goods and workmanship used shall be strictly in accordance with this Bills of Quantities and the Contractor's prices must include for all expenses involved in carrying out the works strictly in accordance herewith. 24.0 Samples and tests The Contractor shall allow for furnishing at his own cost any samples of materials for workmanship that may be called for by the Architect for his approval and any further samples in the case of rejection until such samples are approved by the Architect and the Architect may reject any materials or workmanship not in his opinion in accordance with approved samples. The Architect shall make such tests of the samples or any materials as he may in his discretion deem desireable at the expense of the Contractor. Notwithstanding the test results, the Architect may reject any samples or materials a not being in his opinion in accordance with the specified requirements. The procedure for the submission of samples, testing, marking and identification shall be laid down by the Architect. Materials of any kind obtained from the excavations on the site shall remain the property of the Employer. Such materials shall be dealt with as provided by the contract but the Architect shall have the power to direct its use in the works if the contract does not already so provide. When the Employer's property is permitted to be used in substitution for materials which the Contractor would otherwise have furnished at his own cost, he shall make due allowance thereof at a price to be agreed. 25.0 Royalties and Patent rights 26.0 Assignment 27.0 Subletting 28.0 Suspension of the Works by the Architect		
	Shs.		

ITEM NO			Shs.	Cts.
	29.0	Suspension of the Works by the Contractor		
	30.0	Variations		
		Note: The Contractor shall submit to the Architect claims for any work or circumstance on account on which he may consider that he is entitled to extra payment within seven days from the time of commencement of such works or occurrence of such circumstance. Any such claims must be in writing and accompanied by full particulars and must state under which provision of the contract it is claimed that payment shall be made.		
		All 'Provisional' and other work liable to adjustment under this contract shall be left uncovered for a reasonable time to allow all measurements needed for such adjustment to be taken by the Quantity Surveyor. Immediately the work is ready for measuring, the contractor shall give sufficient notice to the Quantity Surveyor.		
		If the Contractor makes default in these respects, he shall, if the Architect so directs, uncover the work to enable all measurements to be taken and afterwards reinstate at his own expense.		
	31.0	Nominated sub-contractors		
		Note : The Contractor must as soon as practicably possible enter into sub-contracts with Nominated Sub-Contractors on the standard 'Agreement and Schedule of Conditions of Building Sub-Contract' form published by the Kenya Association of Building and Civil Engineering Contractors.		
		He must incorporate therein conditions approved by the Architect and if he fails to do so must accept full responsibilty for any omissions, delays, bad workmanship, claims, expenses arising from the absence of such Sub-Contract. The Sub-Contract must cover such matters as payments on account, retention sums, maintenance period, facilities, dates for completion of each portion of the works together with liquidated and ascertained damages clause in the event of non-completion and indemnity of the Contractor against any such claims arising out of misuse of any such Sub-Contractor or his workmen of any scaffold erected or plant employed by the Contractor, or that may be made against the Contractor in consequence of any act, omission or default of the Sub-Contractor, his servants or agents, or in respect of injury to workmen employed by the Sub-Contractor.		
		Not withstanding Clause 31. the Employer reserves the right to make direct payment to Nominated sub-contractors.		
	32.0	Nominated suppliers		
		Not withstanding Clause 32 the Employer reserves the right to make direct payment to Nominated suppliers.		
	33.0	Work by other persons engaged by the Employer		
	34.0	Payments		
		Note: When applying for certificates and to expedite its issue the Contractor will be required to furnish the Quantity Surveyor with a detailed statement of the work executed and of all materials on site.		
		Shs.		

ITEM NO		Shs.	Cts.
	A schedule of stage payments will be agreed with the Quantity Surveyor. Work stages will be identified which, when completed in accordance with the programe, will result in payment being certified in appriximately one month intervals during the contract period. Materials on site other than for nominated suppliers, will not be taken into account in the computation of certificates. The Contractor, and Nominated Sub-Contractors and Suppliers shall deliver materials or goods to or adjacent to the works subject to Clause 34.11. The Contractor is reminded that he is responsible for providing storage facilities for his own and Nominated Suppliers materials and space for storage of Nominated Sub-Contractors materials and such storage requirements must take into account any premature deliveries that may be permitted by the Architect. 35.0 Fluctuations Note: This is a fixed price contract and the entire clause 35.0 shall be deleted. 36.0 Extensions of time 37.0 Loss and expenses caused by disturbance of regular progress of the Works 38.0 Termination of the contract by the Employer 39.0 Termination of the contract by the Contractor 40.0 Termination of the contract by either party 41.0 Practical completion and defects liability 42.0 Section completion Note: The Contractor's attention is drawn to the fact that the Employer reserves the right to order the execution of the Contract in such stages or phases as he may deem necessary. The Contractor must allow for such ordering of the work in such phases or stages in his prices. The Employer reserves the right to increase or decrease the scope of works in this contract as he may deem necessary. He may require whole sections of the work to be removed from the contract and the Contractor is to allow for such increment or reduction of the scope of the works in his prices. 43.0 Damage for delay in completion 44.0 Antiquities and other objects of value 45.0 Settlement of disputes **Appendix to the schedule of conditions.** The Appendix to the Conditions will be completed as follows: - 13.0: Percentage to cover professional fees for insurance purposes only - 10% 16.1: Name of Contractor's surety - TO BE AGREED 16.1: Amount of Surety - TO BE INSERTED AS A SUM EQUIVALENT TO 10% (TEN PERCENT OF THE CONTRACT SUM		
	Shs.		

ITEM NO.		Shs.	Cts.
	16.2: Name of Employer's surety - NOT APPLICABLE 18.1: Period of Submission of Programme - 14 DAYS 20.1: Period of possession of site - 14 DAYS FROM LETTER OF AWARD 20.2: Contract period - 21 Months 20.2: Date of commencement - TO BE AGREED 20.2: Date of completion - TO BE AGREED 31.14: Name of bank for purposes of interest calculation - CENTRAL BANK OF KENYA 34.1: Interval for application of payment certificates - NOT LESS THAN 4 WEEKS 34.4: Minimum amount of payment certificate - NOT APPLICABLE 34.12: Percentage of certified value retained - 10% 34.12: Limit of retention fund - TO BE INSERTED AS A SUM EQUIVALENT TO 10% (TEN PERCENT) OF THE CONTRACT SUM 34.17: Periods of final measurement and valuation - 3 MONTHS FROM CERTIFIED COMPLETION OF THE WORKS 41.6: Defects liability period - 6 MONTHS AFTER PRACTICAL COMPLETION 43.1: Damages for late completion - AT THE RATE OF Kshs. 880,000.00 PER WEEK OR PART THEREOF		
A.	**TOOLS, PLANT, VEHICLES, ETC.** Allow for providing all plant, cranes, hoists, tools and vehicles required for the works except insofar as may be stated otherwise herein and except for such items specifically and only required for the use of the 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.		
B.	**GOVERNMENT ACTS** Allow for complying with all Government Acts, Orders and Regulations in connection with the employment of labour and other matters related to the execution of the works. In particular the Contractor's attention is drawn to the provisions of the Factory Act of 1950 (and subsequent ammendments thereto), and his tender must include for all costs arising or resulting from compliance with any Act, Order or Regulations relating to Insurance, Pensions and Holidays for workpeople or the safety, current Union Agreements, health or welfare of work The Contractor must make himself fully acquainted with current Acts and Regulations, including the National Construction Authority Act No. 41 of 2011, the Environmental Management and Coordination Act (EMCA), 1999, Police Regulations regarding the movement, housing, security and control of labour, labour camps, passes for transport, etc. The Contractor shall, before tendering, obtain from the relevant Authority full information regarding all such regulations and/or restrictions which may affect the organisation of the works, supply and control of labour, etc., and pay any levies, fees or any other charges in respect to compliance with such laws. No claim in respect of want of knowledge in this connection will be entertained.		
	Shs.		

ITEM NO		Shs.	Cts.
A.	**TRAINING LEVY** The Contractor's attention is drawn to the Legal Notice No. 237 of October, 1971 (and subsequent amendments thereto) which requires payment by the Contractor of a Training Levy on all contracts of more than Kenya Shillings Fifty Thousand (Kshs. 50,000/=) in value and his tender must include for all cost arising or resulting therefrom.		
B.	**PROTECTON OF WORKS AND PERSONS** The Contractor shall allow for the protection of his own and his Sub-Contractors' work liable to damage, including provision of temporary roofs, gutters, drains etc., if necessary and shall case-up, cover, or in othe suitable ways protect all finished work liable to injury, to the satisfaction of the Architect until completion of the Contract. From the beginning to the completion of the works, the works shall be under the entire care and control of the Contractor, who shall take all possible precautions to prevent any nuissance, inconvenience or injury to the holders or occupiers of surrounding properties and to the public generally, and shall at all times keep all paths and roads affected by the works in a safe and clear state, and shall use proper precaution to ensure the safety of all wheeled traffic and pedestrians. The Contractor shall allow for covering open trenches and protection of the works, including Sub-Contractor's works and for the protection of the public and his own and Sun-Contractor's employees. In the event of any damage or loss occurring to the works, or to materials or to any sewers, gullies, drains, paths or other works on the site in temporary possession of the Contractor for the purpose of this contract, either from the weather, want of proper protection, defects, theft, whatsoever during the progress of the works, or for any accident or damage to property or persons by reason of the said works, the Contractor alone shall be responsible and shall without extra charge, make good all damage and pay all costs incurred.		
C.	**SECURITY** The Contractor shall be entirely responsible for the security of the works and shall provide all necessary watching, lighting and other precautions necessary to ensure security against theft, loss or damage and the protection of the public. The Contractor shall also be entirely responsible for the security of the stores, materials, plants personnel, etc., both his own and the Sub-Contractors' and shall take all measures and precautions as necessary. The Contractor shall leave works secure at completion with all accesses locked, account for all keys and hand over to the Architect with an itemized schedule, retaining a duplicate schedule signed by the Architect as receipt.		
D.	**EXISTING PROPERTY** The Contractor shall take every precaution to avoid damage to all existing property including roads, cables, drains and other services, and he shall be held responsible for and shall make good all such damage arising from the execution of this Contract at his own expense to the satisfaction of the Architect and the authorities.		
	Shs.		

ITEM NO		Shs.	Cts.
A.	**SIGN FOR MATERIALS SUPPLIED** The Contractor will be required to sign a receipt for all articles and materials supplied by the Employer at the time of taking delivery thereof, as having received them in good order and condition, and will thereafter be responsible for any loss or damage and for replacement of any such loss or damage with articles and/or materials which will be supplied by the Employer at current market prices including all duties and taxes, all at the contractor's own cost and expense, to the satisfaction of the Employer.		
B.	**SIGNBOARD** The Contractor shall erect, maintain and afterwards remove a project signboard constructed in strict accordance with the Architect's specifications.		
C.	**POSSESSION AND COMMENCEMENT** The contractor shall take possession of the site on the date indicated in the acceptance letter. The date of commencement of the works shall be as indicated in the acceptance letter. The contractor is expected to utilize the period between possession and commencement to mobilize his resources to ensure smooth running of the works from the commencement date.		
D.	**PROGRAMME AND PROGRESS** The Contractor shall furnish the Architect for approval and display in the site offices, a Programme and Progress chart devised in such a way that the lined programme is shown and progress can be marked up as the works proceed. The Contractor shall keep this chart up to date at all times.		
E.	**ORDERING OF MATERIALS** The Contractor shall order all materials to be obtained from overseas immediately after the Contract is signed and shall also order materials to be obtained from local sources as early as necessary to ensure that they are on site when required for use in the works.		
F.	**DAYWORKS** The Architect may, if in his own opinion it is necessary or desirable, order in writing that any additional or substituted work shall be executed on a Daywork basis. The Contractor shall then be paid for such work in accordance with Daywork rates and percentage additions to be agreed. The Contractor shall furnish the Architect all receipts or vouchers as maybe necessary to prove the amounts paid and before ordering materials shall submit to the Architect quotations for the same for his approval. In respect of all works executed on a Daywork basis the Contractor shall, during the continuance of such work, deliver each day to the Architect a list in duplicate of the names, occupation and time of all workmen employed on such work and a statement also of, in duplicate showing the description and quantity of all materials and plant used thereon or therefor (other than plant which is included in the percentage addition on net amount of wages).		
	Shs.		

ITEM NO		Shs.	Cts.
	One copy of each list and statement will, if correct or when agreed, be signed by the Architect and returned to the Contractor. At the end of each month the Contractor shall deliver to the Architect a priced statement of the labour, material and plant (except as aforesaid) used and the Contractor shall not be entitled to any payment unless such lists and statements have been fully and punctually rendered. Provided always that, if the Architect shall consider that for any reason the sending of such lists or statement by the Contractor in accordance with the foregoing provision was impracticable, he shall nevertheless be entitled to authorise payment for such work either as daywork (on being satisfied as to the time employed and plant and materials used on such work) or at such value thereof as he shall consider fair and reasonable.		
A.	**WATER FOR THE WORKS** The Contractor shall allow for providing all temporary water supplies required for the works, including Sub-Contractor's works, together with all necessary storage tanks and distribution systems for the same and must allow for bearing all expenses incurred and for paying for all water consumed without charge to any Sub-Contractor. Expenses with connection with Nominated Sub-Contractors shall be allowed for in the attendance items under the relavant P.C. Sums.		
B.	**LIGHTING AND POWER FOR THE WORKS** The Contractor shall allow for providing all temporary lighting and power supplies required for the works, including Sub-Contractor's works, together with all necessary distribution systems for the same and must allow for bearing all expenses incurred and paying for all current consumed without charge to any Sub-Contractor. Expenses with connection with Nominated Sub-Contractors shall be allowed for in the attendance items under the relavant P.C. Sums.		
C.	**SITE OFFICE** The Contractor must allow for erecting and maintaining on the site, in such position as may be directed, adequate site offices for the use of his own site staff and removing same at completion and making good all surfaces disturbed. The site office shall be of sufficient size and shall have sufficient furniture to allow Architect to hold site meetings in it size 24m x 4.5m The Contractor shall allow for providing, erecting and maintaining where directed a lock-up hut containing a pedestal type water closet and wash basin for the sole purpose of the Architect and other consultants, including making temporary connections to drains and water supplies and paying all charges for connections, conservancy and water consumed. The Contractor shall allow for providing the services of a sweeper, for keeping both office and closet in a clean and sanitary condition from the commencement to completion of the works; and for dismantling at completion and making good all disturbed surfaces. The office and closet shall be completed before the contractor will be permitted to commence the works. The contractor shall supply snacks and light refreshments for all site meetings and inspections of sufficient quantity and quality as directed by the Architect. The snacks and light refreshment shall include but not limited to brewed tea/coffee, bottled water, sodas and light snacks such as biscuits, bhajias, crisps, ground nuts, bacon, sausages, sandwiches and the like). The snacks should meet general hygiene standards and be replenished daily, or as necessary, to ensure freshness.		
D.	**TELEPHONE** The Contractor shall allow for providing and maintaining a telephone upon the site during the contract period and for paying all charges.		
	Shs.		

ITEM NO		Shs.	Cts.
A.	**SHEDS FOR STORAGE OF MATERIALS** The Contractor shall provide for himself and all Sub-Contractors, erect and maintain on site, in such position as may be directed, ample temporary watertight, lockup sheds for the proper storage and protection of cement and other materials liable to damage and shall remove same at completion and make good all surfaces disturbed. He shall also provide space for storage accommodation which Sub-Contractors may wish to erect for themselves.		
B.	**RESTRICTIONS ON WORKING HOURS** The works shall be executed under the direction and to the entire satisfaction in all respects of the Architect who shall at all times during normal working hours have access to the works and to the yards and workshops of the Contractor and Sub-Contractor or other places where work is being prepared for the Contract. The working hours shall be those generally worked by good employers in the Building and Civil Engineering Trades in Kenya. No work shall be carried out at night or on gazetted holidays unless the Architect shall so direct. In areas where there are restrictions by resident associations or such bodies, those restrictions are to be respected. No work shall be covered up nor shall any concreting be carried out in the absence of the Clerk of Works without the prior approval of the Architect in writing.		
C.	**SANITATION OF THE WORKS** The contractor shall allow for providing the necessary latrines for the labour employed on the works, including labour employed by the Sub-Contractors, to the satisfaction of the Health and Medical Authorities and for maintaining the same in a thoroughly clean and sanitary condition and for paying all conservancy fees. The contractor shall allow for removing the said latrines and leaving the ground clean and free from pollution upon completion to the satisfaction of the Health and Medical Authorities.		
D.	**NO WORKMEN TO BE HOUSED ON SITE** No labour with the exception of a watchman may be housed on site. The cost of transporting labour daily to and from the site or elsewhere as required will be deemed to be included in the tender.		
E.	**PREPARATION OF SITE, WORKS, ETC** The Contractor shall allow for all necessary preparation of the site , works and the materials prior to commencement of construction. As far as possible the Contractor will be given a clear and clean site without encumbrances but the Contractor shall allow for any necassary site clearing and preparation of existing construction all in accordance with the Architect's instructions. He must also allow for any disruption and inconvinience caused by other Contractors and employees of the employer and building owner working on and adjacent to the site throughout the contract period. No claims for extras in respect of expenses involved in opening up and preparing the site and works for construction or for disruption caused by the presence on site of others will be allowed and the Contractor must satisfy himself as to the extent of the work involved and the effect of the disruption to be expected.		
	Shs.		

ITEM NO		Shs.	Cts.
A.	**WORK TO BE OPENED UP AT THE REQUEST OF THE ARCHITECT** The Contractor shall, at the request of the Architect within such time as the Architect shall name, open for inspection any work covered up, and, should the Contractor refuse or neglect to comply with such request, the Architect 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 Architect's instructions, or if, on being opened up, it be found not in accordance with the drawings or the Bills of Quantities or the istructions of the Architect, the expenses of opening and covering it up again whether done by the Contractor or the Architect 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 to such instructions and be found in accordance with the said drawings and Bills of Quantities, then the expense 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 Architect shall, within a reasonable time after the work has been opened, make or cause to be made the inspection thereof, and at 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.		
B.	**HOARDING** The Contractor shall allow for providing and clearing away on completion such temporary fencing or hoarding and gates as may be necessary for the protection of the works and the public, all to the Architect's approval and Local Authority requirements. The Contractor will be responsible for paying any fees or taxes in respect of the hoarding. The hoarding and the gates shall be painted as directed by the Architect. The Contractor shall allow for thoroughly maintaining the hoarding and gates throughout the contract and clearing away making good disturbed ground on completion. All materials arising will remain the property of the Contractor and he should allow credit against this accordingly.		
C.	**SCAFFOLDING** The Contractor shall allow for providing, erecting and dismantling all general scaffolding required for the works. The Contractor must allow here or in his rates for providing all special scaffolding required by his Sub-Contractors, other than Nominated Sub-Contractors carrying out works for which P.C. Sums are included in this Bills. Expenses with connection with scaffolding for Nominated Sub-Contractors shall be allowed for in the attendance items under the relavant P.C. Sums.		
D.	**REMOVAL OF PLANT, RUBBISH ETC** The Contractor must allow for removing and clearing away all plant, rubbish and unused materials, and leaving the whole of the site of works in a clean and tidy state at completion to the satisfaction of the Architect. He must also allow for removing all rubbish and dirt from the site as it accumulates dring the performance of the contract.		
	Shs.		

ITEM NO		Shs.	Cts.
A.	**DEDUCTION FROM MONEY DUE TO THE CONTRACTOR** The Architect shall be entitled to deduct any monies that the Contractor shall be liable to pay under the contract to the Employer from any sum which maybe payable to the Contractor hereunder and the Architect in issuing his certificates as provided in Clause 34 of the Schedule of Conditions shall have regard to any sum so chargable to the Contractor. Provided always that this provision shall not affect any other remedy by action at law or otherwise to which the Employer may be entitled for the recovery of such monies.		
B.	**WORKS TO BE DELIVERED UP CLEAN** On completion of the Contract, the site and the works shall be cleared of all plant, scaffolding, rubbish and unused materials and shall be delivered up clean and in perfect condition in every respect to the satisfaction of the Architect. Particular attention is to be paid to leaving all windows and floors clean and removing all paint and cement stains.		
C.	**APPROVED SUB-CONTRACTORS** Where in these Bills of Quantities work is described to be executed by an approved Sub-Contractor the firm appointed will be treated as a Domestic Sub-Contractor employed by the Contractor and not as a nominated Sub-Contractor. Any Domestic Sub-Contractor shall be approved by the Architect in writing before the Contractor sublets any portion of the works. The unit prices for such work must, therefore, include not only the Sub-Contractor's charges but also the Contractor's overheads, profits and attendance.		
D.	**DISPOSAL OF WATER** Allow for keeping excavations and works free from all water, including spring and running water by pumping or any other means as required.		
E.	**MAINTAINING SIDES OF EXCAVATION** Allow for maintaining the sides of all excavations by planking and strutting or other means as required. Additional works caused the collapse of excavations through inadequate planking and strutting will be at the Contractor's expense.		
F.	**WHITE ANTS** Allow for destroying of any white ants' nests found in the vicinity of the buildings, destroy Queen Ants, depositing cyanide lumps or any other appropriate anti-termite treatment in holes and tunnels and filling with hardcore and murram well rammed and sealed.		
G.	**TESTING** Allow for all expenses in connection with the testing of materials and workmanship such as concrete tests and the like including the supply and preparation of materials to be tested, the cost of materials and their packing and conveyance to an approved Testing Laboratory, laboratory charges, etc.		
H.	**PROVISIONAL SUMS** The term "Provisional Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A, Item A6 (i) of the Standard Method of Measurement. Such sums are net and no addition shall be made to them for profit.		
	Shs.		

ITEM NO		Shs.	Cts.
A.	**PRIME COST (P.C.) SUMS** The term "Prime Cost Sum" or "P.C Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A Item A7 (ii) of the Standard Method of Measurement. Persons or firms nominated by the Architect to execute work or to provide and fix materials or goods as stated in clause 31 and 32 of the Conditions of Contract are described herein as Nominated Sub-Contractors. Persons or firms so nominated to supply goods or materials are described herein as Nominated Suppliers.		
B.	**ADJUSTMENT OF PRIME COST (P.C.) SUMS** In the final account all P.C. Sums shall be deducted and the amount properly expended upon the Architect's order in respect of each of them added to the Contract sum. The Contractor shall produce to the Architect such quotations, invoices or bills, properly receipted as may be necessary to show the actual details of the sums paid by the Contractor. Items of profit upon P.C. Sums shall be adjusted in the final account pro-rata to the amount paid. Items of "attendance" and "special attendance" following P.C. Sums shall be adjusted pro-rata to the physical extent of the work executed (not pro-rata to the amount paid) and this shall apply even though the Contractor's priced Bill shows a percentage in the rate column in respect of them. Should the Contractor be permitted to tender and his tender be accepted for any work for which a P. C. Sum is included in these Bills of Quantities profit and attendance will be allowed at the same rate as it would be if the work were executed by a nominated Sub-Contractor.		
C.	**ADJUSTMENT OF PROVISIONAL SUMS** In the final account all Provisional Sums shall be deducted and value of the work properly executed in respect of them upon the Architect's order added to the Contract Sum. Such work shall be valued as described for Variations in Clause No. 30 of the Conditions of Contract, but should any part of the work be executed by a Nominated Sub-Contractor or any articles for the work to be supplied by a Nominated Supplier, the value of such work or articles shall be treated as a P.C. Sum and profit and attendance comparable to that contained in the priced Bills of Quantities for a similar items added.		
D.	**ATTENDANCE UPON NOMINATED SUB-CONTRACTORS** The term "attendance" following P.C. Sums for Nominated Sub-Contractors' work in these Bills of Quantities shall be deemed to include both attendance and items of special attendance.		
E.	**DIRECT CONTRACTS** Notwithstanding the foregoing conditions, the Employer reserves the right to place a "Direct Contract" for any goods or services required in the works which are measured or covered by a P.C. or Provisional Sum in the Bills of Quantities and to pay for the same direct. In any such instance, profit relative to the P.C. Sums in the priced Bills of Quantities will be adjusted as described for P.C. Sums.		
	Shs.		

ITEM NO		Shs.	Cts.
A	**ATTENDANCE UPON OTHER TRADESMEN, ETC.** The Contractor shall allow for the attendance of trade upon trade and shall afford any tradesmen or other person employed for the execution of any other 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. The Contractor shall perform such cutting away for and making good after the work of such tradesmen or persons as may be ordered by the Architect and the work will be measured and paid for the extent executed at rates provided in these Bills.		
A.	**VALUE ADDED TAX** The Contractor's attention is drawn to Value Added Tax Act, Particularly the Contractors' VAT effective September, 1993 and any other amendments thereafter and his tender is deemed to include for all costs arising or resulting therefrom.		
B.	**APPENDICES** The Appendices to these Bills of quantities shall be regarded for the Contract purposes as part of the Bills and shall be read and constructed with the appropriate sections of the Bills as if contained therein.		
	Shs.		

ITEM NO		Shs.	Cts.
	BILL No. 1 **PRELIMINARIES AND GENERAL CONDITIONS** **COLLECTION**		
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	From Page 18		
	TOTAL AMOUNT OF PRELIMINARIES AND GENERAL CONDITIONS TO MAIN SUMMARY		

BILL No. 2

HOSTEL BLOCK - BOYS

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	SUBSTRUCTURES (ALL PROVISIONAL)				
	EXCAVATION AND EARTHWORK				
	EXCAVATION				
	Excavating				
	Bulk excavation to remove black cotton soil				
A	Over 300 mm deep; not exceeding 1.50 m deep	2,431	cm		
B	Over 300 mm deep; 1.50 m to 3.00 m deep	810	cm		
	Extra over all kinds of excavations for				
C	Excavating in rock irrespective of hardness or depth	2,096	cm		
	Disposal				
	Surplus excavated material				
D	Removing from site	3,241	cm		
	FILLING				
	Hardcore				
	Filling in making up levels well rolled and compacted to 100% maximum dry density				
E	Over 300mm thick; handpacked; in layers maximum 150 mm thick	2,816	cm		
	Take from store hardcore arising from demolished structures; fill in to make up levels, well roll and compact to 95% maximum dry density				
F	Over 300mm thick; handpacked; in layers maximum 150 mm thick	2,316	cm		
	Stone or quarry dust				
	Blinding surfaces of fill				
G	50 mm thick; compacted to approval to receive damp proofing membrane (m/s)	1,310	sm		
	DAMP PROOFING MEMBRANES				
	1000 Gauge 'diothene' or other equal and approved polythene sheeting damp proofing membrane; with welted laps (measured net - no allowance made for laps)				
	Horizontal; in 1 No. layer(s)				
H	Over 300mm wide; laid on compacted murram or quarry dust blinding (measured separately)	1,481	sm		
	ANTI-TERMITE AND HERBICIDE TREATMENT				
	Premise 200 SC Chemical anti termite treatment manufactured by Bayer Environmental Science or other equal and approved insecticide; applied strictly in accordance with the Manufacturer's printed instructions;				
	Application to be carried out by an approved specialist; with and including a Ten years written guarantee; Tender rate shall allow within the unit rate build up for treating vertical sides of foundation trenches, column base pits and around building plinth as quantity indicated herein is measured flat overall on net ground floor surface beds; all to the Architect's approval				
J	To surfaces of fill and tops of foundation walls	1,481	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	CONCRETE WORK				
	INSITU CONCRETE: PLAIN				
	Normal: mass concrete (1:3:6 mix / 20mm aggregate)				
	Blinding				
A	50 mm thick	842	sm		
	INSITU CONCRETE: REINFORCED				
	Normal: class 25/(20mm): vibrated				
	Foundations in trenches				
B	Generally	17	cm		
	Column bases				
C	Generally	438	cm		
	Ground beams and the like				
D	Generally	43	cm		
	Columns: vertical or sloping not exceeding 15 degrees from horizontal				
E	Generally	69	cm		
	Steps				
F	Generally	6	cm		
	Beds laid in bays not exceeding 35 square metres; including formwork between bays				
G	100 mm thick	1,281	sm		
	Ramps				
H	100 mm thick; sloping not exceeding 15 degrees from horizontal	52	sm		
	Walls				
J	200 mm thick	45	sm		
	REINFORCEMENT				
	Bars; high yield deformed steel; cold worked and ribbed to B.S. 4449 including bends, hooks, tying wire, distance blocks, spacers and the like				
	In any location				
K	25 mm Diameter	7,719	kg		
L	20 mm Diameter	4,298	kg		
M	16 mm Diameter	24,019	kg		
N	12 mm Diameter	20,899	kg		
P	10 mm Diameter	15,408	kg		
Q	8 mm Diameter	6,667	kg		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	Fabric				
	Steel wire fabric mesh reinforcement to B.S. 4483 Ref: A 252 and K.S. 02-18:1976; weighing 3.95 kg per square metre (measured net - no allowance made for minimum 300mm laps); including tying and supporting as required				
A	In any location	1,306	sm		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Risers of steps and staircase				
B	75 to 150 mm wide	41	lm		
	Edges of staircase string; cutting to profile of steps				
C	225 to 300 mm wide	25	lm		
	Edges of beds, roads, footpaths, pavings and the like				
D	75 to 150 mm wide	374	lm		
	Sides; vertical or battering				
E	Walls or the like	179	sm		
F	Columns	683	sm		
G	Ground beams	425	sm		
H	Foundations	55	sm		
J	Column bases	491	sm		
	CONCRETE SUNDRIES				
	Labour and material				
	Water bars; standard plasticised PVC bulb-edged strip				
K	200 mm wide; as Sika V-20L or other equal and approved; set in concrete as the works proceed	11	lm		
	WALLING				
	NATURAL STONEWORK				
	Approved local stone; squared; bedding and jointing in cement mortar (1:4)				
	Walls				
L	200 mm thick; reinforced with hoop iron gauge 500 in every alternative course; with a minimum compressive strength of 7 Newton/square millimetre	650	sm		
M	Fair raking cutting	48	lm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	WALLING SUNDRIES				
	Labour and material				
	Metal cramps				
A	No. 16 B.W.G fixing cramps; 25mm wide x 450mm girth; one end cast into and including mortice in existing concrete and properly secured to existing reinforcement and the other end built into joints of walling	1,404	No		
	EXPANSION JOINTS				
	Expansion joint filler				
	'Flexcell' or other equal and approved expansion joint filler; applied in strict accordance with Manufacturer's printed instruction and to the Architect's approval				
B	Over 300mm to walls or concrete including any necessary formwork	28	sm		
C	Rake out expansion joint filler to form 10x25mm wide groove; fill groove with approved mastic filler	7	lm		
	WATERPROOFING WORK				
	WATERPROOFING				
	Sika 1 or other equal and approved waterproofing compound; to B.S 6920				
	Applied in strict accordance with the Manufacturer's printed instructions; at the minimum rate of 9 litres per cubic metres ; including issuing a Twenty (20) year guarantee				
D	Walls	90	sm		
	FLOOR, WALL AND CEILING FINISHES				
	INSITU FINISHINGS				
	Plaster; 12 mm first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5); wood floated hard and smooth to finish				
	25 mm thick 2 No. coat work; to concrete or blockwork base (m/s); generally to				
E	Walls; plinths; external	239	sm		
	PAINTING AND DECORATING				
	3 COAT(S) BLACK BITUMASTIC PAINT; TO CROWN PAINTS OR EQUAL AND APPROVED				
	Wood floated rendered surfaces				
	Walls				
F	Over 300 mm girth; external	239	sm		
	DRAINAGE				
	THE FOLLOWING IN BULK WATER STORAGE TANK(S)				
	Excavating				
	Bulk excavation to remove black cotton soil				
G	Not exceeding 1.50 m deep	329	cm		
H	1.50 to 3.00 m deep	110	cm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	Extra over all kinds of excavations irrespective of depth for				
A	Excavating in rock irrespective of hardness	220	cm		
	Disposal				
	Surplus excavated material				
B	Removing from site	439	cm		
	Filling				
	Approved hardcore filling				
C	Filling depositing and compacting to 100% B.S.S. compaction in layers maximum 150 mm thick; over 300mm thick	390	cm		
D	300 mm thick filling depositing and compacting to 100% B.S.S. compaction in layers maximum 150 mm thick	55	sm		
	Stone or quarry dust				
E	50 mm thick blinding to surfaces to fill; compacted to approval	185	sm		
	Insitu concrete reinforced; normal; class 25/(20 mm) ; vibrated				
	Hollow Block Suspended Construction				
	Ribs and topping concrete class 25/(20 mm); precast concrete hollow blocks size 400 x 230 x 300 mm high in rows at 450 mm centres from an approved manufacturer; 150 mm wide ribs; 100 mm thick topping concrete; vibrated				
F	Suspended floors; roofs or the like; 400mm thick overall	164	sm		
	Insitu concrete reinforced; guaranteed strength; Class 30/(20 mm) ; vibrated				
	Tank base				
G	250 mm thick	200	sm		
	Beams				
H	Generally	8	sm		
	Walls				
J	250 mm thick	219	sm		
	Sump base				
K	250 mm thick	1	sm		
	Sump walls				
L	250 mm thick	1	sm		
	Formwork to insitu concrete; formwork generally; removing through constrained space or opening				
	Soffites; horizontal				
M	Suspended cover slabs; strutting 3.50 to 5.00 m high	164	sm		
	Sides; vertical				
N	Walls or the like	439	sm		
P	sump walls	3	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	Sides and soffites				
A	Beams or the like; strutting 3.50 to 5.00 m high	49	sm		
	Edges of base slabs				
B	225 to 300 mm high	4	lm		
	Edges of suspended floors or the like				
C	Over 300mm wide	49	sm		
	Reinforcement; bars; high yield deformed steel; cold worked and ribbed to B.S. 4449 including bends, hooks, tying wire, distance blocks, spacers and the like				
	In any location				
D	16 mm diameter	789	kg		
E	12 mm diameter	5,415	kg		
F	10 mm diameter	12,407	kg		
G	8 mm diameter	2,878	kg		
	Reinforcement; fabric; B.S. 4483				
	Reference A 252; mesh 200 x 200 mm; weight 3.95 kgs per square metre; 200 mm end laps; 200 mm side laps				
H	In any location	164	sm		
	Coated cast iron double seal access covers and frames; B.S. 497				
	Bedding frames in cement mortar (1:4); haunching in plain concrete (1:3:6) where necessary; bedding covers in grease and sand				
J	450 x 450 mm; heavy duty	1	No		
K	600 x 450 mm; heavy duty	1	No		
	Service pipework to B.S. 1387; Class B; galvanised mild steel; medium grade; screwed and socketted; galvanised mild steel screwed fittings to B.S. 1256				
	Vent pipe				
L	100 mm diameter; with and including appropriate water seal sleeve and puddle flange	2	lm		
M	Extra; bend with and including fixing mosquito wire gauze as approved	4	No		
N	Equal tee	2	No		
	Plaster; cement and sand (1:3); with 5% 'Pudlo' or other equal and approved waterproofing compound; steel trowelled hard and smooth to finish				
	25 mm thick; to concrete or blockwork base; generally to				
P	Walls	421	sm		
Q	Soffites; horizontal	49	sm		
	Screed; cement and sand (1:3); with and including an approved waterproofing compound; steel trowelled hard and smooth to finish				
	75 mm thick; to concrete or blockwork base; generally to				
R	Floors; level	185	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
A	Extra; forming 75 x 75 mm triangular fillet	62	lm		
	Sika 1 or other equal and approved waterproofing compound				
	Applied in strict accordance with manufacturer's printed instructions; including issuing a Ten year warranty				
B	Walls	439	sm		
C	Applied to tank base	200	sm		
	Sundries				
	Walls				
D	200 mm wide Sika V-20L plasticised PVC waterbar set in concrete (m/s) as the works proceed	60	lm		
	Stainless steel				
	Cat ladders				
E	450 mm wide; constructed of 40 x 4mm mild steel flats welded to each other at 40mm cross-centres both ways; including setting in grease to and including 50 x 50 x 6 mm angle frame all round fixed to concrete (m/s) with and including 100 mm long x 10 mm diameter round bar lugs one end welded to frame, the other end fishtailed and grouted into and including mortice in concrete at 300 mm centres; including painting all metal work with 3 coats of approved bituminous paint	7	lm		

Ref.	Description	Kshs/Cts
	SUBSTRUCTURES (ALL PROVISIONAL)	
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646	Male Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	REINFORCED CONCRETE FRAME				
	CONCRETE WORK				
	INSITU CONCRETE: REINFORCED				
	Normal: class 25/(20mm): vibrated				
	Beams; horizontal or sloping not exceeding 15 degrees from horizontal				
A	Generally	310	cm		
	Columns: vertical or sloping not exceeding 15 degrees from horizontal				
B	Generally	169	cm		
	Suspended staircase ; sloping exceeding 15 degrees from horizontal				
C	Generally	70	cm		
	Suspended floors, roofs or the like; horizontal				
D	150 mm thick	6,278	sm		
E	200 mm thick	152	sm		
	Walls				
F	200 mm thick	182	sm		
	Suspended landings				
G	200 mm thick	51	sm		
	HOLLOW BLOCK SUSPENDED CONSTRUCTION				
	Ribs and topping concrete class 25/(20 mm); precast concrete hollow blocks size 400 x 230 x 300 mm high in rows at 450 mm centres from an approved manufacturer; 150 mm wide ribs; 100 mm thick topping concrete; vibrated				
	Suspended floors, roofs or the like;				
H	400 mm thick overall	508	sm		
	REINFORCEMENT; ALL PROVISIONAL				
	Bars; high yield deformed steel; cold worked and ribbed to B.S. 4449 including bends, hooks, tying wire, distance blocks, spacers and the like				
	In any location				
J	25 mm Diameter	4,014	kg		
K	20 mm Diameter	10,035	kg		
L	16 mm Diameter	45,212	kg		
M	12 mm Diameter	20,941	kg		
N	10 mm Diameter	105,286	kg		
P	8 mm Diameter	46,721	kg		
	In any location; curved on plan to various radii				
Q	16 mm Diameter	19	kg		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	Fabric				
	Steel wire fabric mesh reinforcement to B.S. 4483 Ref: A 252 and K.S. 02-18:1976 in hollow pot slab (m/s) (measured net - no allowance made for minimum 300mm laps); weighing 3.95 kg per square metre; including tying and supporting as required				
A	In any location	508	sm		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Soffits; horizontal				
B	Suspended floor slabs	6,330	sm		
C	Suspended landings	51	sm		
	Soffites; sloping				
D	Suspended staircases and the like	131	sm		
	Edges of suspended slab				
E	75 to 150 mm wide	1,263	lm		
F	150 to 225 mm wide	59	lm		
G	Over 300mm wide	208	sm		
	Edges of suspended landing				
H	150 to 225 mm wide	117	lm		
	Risers of steps and staircase				
J	75 to 150 mm wide	390	lm		
	Edges of staircase string; cutting to profile of steps				
K	Over 300mm wide	100	sm		
	Sides; vertical or battering				
L	Walls or the like	365	sm		
M	Columns	2,043	sm		
	Sides and soffites				
N	Beams or the like; horizontal	3,055	sm		
	Soffites; curved on plan to various radii				
P	Beams or the like; horizontal	4	sm		
	WALLING				
	EXPANSION JOINTS				
	Expansion joint filler				
	'Flexcell' or other equal and approved expansion joint filler; applied in strict accordance with Manufacturer's printed instruction and to the Architect's approval				
Q	Over 300mm to walls or concrete including any necessary formwork	132	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
A	Rake out expansion joint filler to form 10x25mm wide groove; fill groove with approved mastic filler	44	lm		

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Ref.	Description	Kshs/Cts
	REINFORCED CONCRETE FRAME	
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Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	EXTERNAL AND INTERNAL WALLS				
	CONCRETE WORK				
	PRECAST CONCRETE				
	Normal; class 20/(20mm); vibrated				
	Lintels				
A	150 mm wide x 450 mm high; reinforced with 4 No. 12 mm diameter high yield deformed bar reinforcement hooked on ends and with 8mm diameter links at 200mm centres hooked on ends for appropriate anchorage; with and including all appropriate tying wires, spacer blocks and the like	601	lm		
B	200 mm wide x 300 mm high; reinforced with 4 No. 12 mm diameter high yield deformed bar reinforcement hooked on ends and with 8mm diameter links at 200mm centres hooked on ends for appropriate anchorage; with and including all appropriate tying wires, spacer blocks and the like	3	lm		
	Normal; class 20/(20 mm); vibrated; surface fair finish				
	Copings				
C	300 x 75 mm ; once sunk weathered; once throated; reinforced as necessary for handling; surface finish 650 mm girth; bedding, jointing and pointing in cement mortar (1:4)	305	lm		
	WALLING				
	NATURAL STONEWORK				
	Approved local stone; machine cut; bedding and jointing in cement mortar (1:3); with a minimum compressive strength of 7N per square millimetre				
	Walls				
D	100 mm thick; reinforced with hoop iron gauge 500 in every alternative course	1,088	sm		
E	Fair raking cutting	224	lm		
F	150 mm thick; reinforced with hoop iron gauge 500 in every alternative course	5,882	sm		
G	200 mm thick; reinforced with hoop iron gauge 500 in every alternative course	3,778	sm		
	WALLING SUNDRIES				
	Labour and material				
	Metal cramps				
H	No. 16 B.W.G fixing cramps; 25mm wide x 450mm girth; one end cast into and including mortice in existing concrete and properly secured to existing reinforcement and the other end built into joints of walling	5,332	No		
	DAMP PROOF COURSES				
	B.S. 743; type A; Hessian based 3 ply bituminous felt; 150 mm laps;				
	Horizontal; 1 No of layer(s); (measured overall - no allowance made for laps); laid and bedded on levelled cement mortar (1:3)				
J	100mm wide	68	lm		
K	150mm wide	479	lm		
L	200mm wide	397	lm		

Ref.	Description	Kshs/Cts
	EXTERNAL AND INTERNAL WALLS Page No. 13	
646	Male Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	ROOF CONSTRUCTION, COVERING AND RAINWATER DISPOSAL				
	WATERPROOFING WORK				
	GENERAL WATERPROOFING WORKS				
	APP Membranes				
	Sirrah PGR 4 or other equal and approved; supplied by Messrs. Italbuild Imports Ltd; weighing 4 kg/sm; multi-layered with ceramic chip finish; flame applied and bonded to concrete or blockwork (m/s); vertical or sloping exceeding 15 degrees				
A	Over 300mm wide; to floors	1,471	sm		
B	Extra over; dressing over rainwater outlet (m/s)	8	No		
C	300 mm wide to walls; including dressing into and including 50 x 50mm mortice cut into concrete or blockwork and casting with gauged mortar	312	lm		
	PLUMBING AND DRAINAGE INSTALLATIONS				
	RAINWATER INSTALLATIONS				
	Pipework; Unplasticised P.V.C. to B.S. 5481; Heavy gauge				
	Pipes; soldered connections in the running length; fixing with approved galvanized mild steel holderbats at appropriate centres to backgrounds				
D	100 mm diameter	148	lm		
E	Extra; Horse shoe bend	8	No		
F	Extra; Swanneck bend	8	No		
	Rainwater fittings; cast aluminium				
	Roof outlets; : "fulbora" type; joints to pipes				
G	200 mm diameter; cast into concrete slab	8	No		
	FLOOR, WALL AND CEILING FINISHES				
	TILE, SLAB OR BLOCK FINISHINGS				
	Precast concrete interlocking tiles as manufactured by Messrs Mitchell Cotts Kenya Ltd. or other equal and approved; to regular pattern; bedding, jointing and pointing in cement mortar (1:4)				
	250 x 250 x 15 mm; butt joints straight both ways; on and including 40 mm sand bed; generally to				
H	Floors; to falls, crossfalls or sloping not exceeding 15 degrees from horizontal; internal	1,355	sm		
J	Skirtings; 150 x 15 mm thick; internal	312	lm		
	BEDS OR BACKINGS				
	Render; cement and sand (1:4)				
	15 mm thick one coat backings; steel trowelled to a smooth surface to receive waterproofing (m/s); to concrete or blockwork base; generally to				
K	Walls; external	103	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	Lightweight screed; cement and vermiculite aggregate (1:8); 12 mm cement and sand (1:4) toping; with and including an approved waterproofing to the satisfaction of the Architect				
	100 mm thick (average) one coat beds; wood floated to falls and crossfalls; to receive waterproofing compound (m/s); to concrete or blockwork base; generally to				
A	Floors; to falls, crossfalls or sloping not exceeding 15 degrees from horizontal; internal	1,355	sm		
B	50 x 50 mm triangular fillet	312	lm		

Ref.	Description	Kshs/Cts
	ROOF CONSTRUCTION, COVERING AND RAINWATER DISPOSAL	
	Page No. 15	
	Page No. 16	
646	Male Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	WINDOWS				
	CONCRETE WORK				
	PRECAST CONCRETE				
	Normal; class 20/(20 mm); vibrated; surface fair finish				
	Sills				
A	300 x 75 mm ; once sunk weathered; once throated; reinforced as necessary for handling; surface finish 700 mm girth; bedding, jointing and pointing in cement mortar (1:4)	469	lm		
	JOINERY				
	IRONMONGERY				
	Accessories				
	Curtain rods; solid wrought iron patterned to approval; each curtain rod fixed with and including 2 No. decorative wrought iron decorative sphere finial and appropriate end brackets; fixing with chromium plated screws to backgrounds requiring plugging				
B	20 mm diameter	379	lm		
C	25 mm diameter	379	lm		
	METAL WORK				
	SHEET METAL				
	Mild steel				
	Decorative window cladding				
D	2mm, machine cut to approved pattern; welded to approval including all necessary ironmongery horizontally and 75x50x3mm thick frame all round grinding and making smooth welds with and including silicon paint to approval; size 2050 x 2500 mm	64	no		
E	2mm, machine cut to approved pattern; welded to approval including all necessary ironmongery horizontally and 75x50x3mm thick frame all round grinding and making smooth welds with and including silicon paint; size 2050 x 2500 mm; with a semicircular top	16	no		
F	Curved cutting	12	lm		
	PURPOSE MADE UNITS				
	Composite extruded powder coated coloured (to Architect's approval) aluminium windows; constructed of standard hollow or angle sections with frames mitred at corners including reinforcing cleats; permanent ventilators full width; opening sections sliding; snap rubber glazing beads and sealing strips; and all necessary ironmongery horizontally with and including 50x50x3mm thick frame all round (Note: All windows to be constructed as per details attached in Appendix A at the end of this bill and to any further amplified details in the description or as may be provided by the Architect)				
	Fixing with appropriate screws to approval; plugging or fixing to concrete, blockwork or stone work; sealing with mastic; oiling and adjusting on completion				
G	Window type W1; size 1800 x 2200 mm high	170	No		
H	Window type W2; size 725 x 900 mm high	158	No		
J	Window type W3; size 1800 x 1800 mm high	5	No		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	Supply, assemble and fix the following purpose made powder coated anodised aluminium composite structural curtain walling in approved sections; complete with all sliding or hinged opening panels, coupling mullions, transomes, frames and handles, levers, finger pulls, pins, permanent ventilation with mosquito gauze wire, catches, stays, hinges, approved locking devices and any other necessary accessories where applicable; fixed at predetermined positions with the method of fixing to building structure to be done in strict accordance with the Architect's and Structural Engineer's specifications and approval; with and including preparing and submitting shop drawings and any revisions thereof prior to fixing to the Architect and Structural Engineer; including 'snap on' approved glazing beads; bedding frames in waterproof mastic asphalt externally; oiling, easing, adjusting and leaving the whole of curtaining walling structure in perfect structural and working order (glass m/s)				
	Fixing with appropriate screws to approval; plugging or fixing to concrete, blockwork or stone work; sealing with mastic; oiling and adjusting on completion				
A	Approved structural curtain walling; framework comprising horizontal mullions, cill and head and vertical stiles; all in approved sections; with approved section glazing beads (sample to be done to approval)	239	sm		
	JOINERY FITTINGS				
	THE FOLLOWING IN WINDOW BOARDS				
	Tiled or block finishes				
	Granite; polished; approved colour; fixing to concrete base (m/s) with an approved adhesive				
B	100 x 18 mm thick; to top of wall	392	lm		
	GLAZING				
	GLASS IN OPENINGS				
	Sheet; clear				
	4 mm thick to metal with putty glazing compound				
C	In panes 0.10 to 0.50 square metres	119	sm		
	Sheet; laminated				
	6 mm thick to metal with putty glazing compound				
D	In panes 0.10 to 0.50 square metres	925	sm		

Ref.	Description	Kshs/Cts
	WINDOWS	
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	Page No. 19	
646	Male Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	DOORS				
	JOINERY				
	DOORS				
	Wrot Mahogany; prime grade; selected				
	Framed frames and framings; all housed, cramped and glued together as necessary				
A	150 x 50 mm moulded frames; plugged	3,640	lm		
B	200 x 50 mm moulded frames; plugged	81	lm		
C	75 x 25 mm moulded architrave	7,441	lm		
D	25 x 25 mm moulded glazing beading	1,225	lm		
E	150 x 50 mm moulded transomes	469	lm		
F	200 x 50 mm moulded transomes	18	lm		
	Flush doors; B.S. 459 Part 2				
	Solid core; with and including panelled Mahogany veneered MDF laminate finish; hardwood lipping all edges; solid blocking for ironmongery				
G	Door Type D2 Single door; 45 mm thick ; 900 x 2100 mm high	159	No		
H	Door Type D3 Single door; 45 mm thick ; 800 x 2100 mm high	308	No		
J	Door Type D4 Single door; 45 mm thick ; 750 x 2100 mm high	158	No		
K	Door Type D7 Single door; 45 mm thick ; 1000 x 2100 mm high	6	No		
L	Door Type D10 Single door; 45 mm thick ; 900 x 2500 mm high	12	No		
	Solid core; fire escape door; with 1.5 hrs fire resistance; to Manufacturer's specifications and Architect's approval; Mahogany veneered plywood facing; hardwood lipping all edges				
M	Door Type D1 Double door; 45 mm thick ; 1800 x 2500 mm high; in two equal leaves	10	No		
	IRONMONGERY				
	Supply and fix the following ironmongery to timber complete with matching screws and keys as per 'UNION' manufacturers (reference to a particular catalogue are given as a guide to type and quality only, other equal and approved alternatives may be used)				
	To softwood, hardwood or the like fixing with screws				
N	Brass butt hinges; 100 x 50 mm; double washered	980	Prs		
P	3 Point locking push bar panic device; Union 882L-W; Stainless steel; with and including upper, lower and lateral Pullman latches; adjustable push bar; anti-thrust steel deadlatch; adjustable flat, corner and floor steel striking plates; and engraved fire sign	10	No		
Q	Brass coat and hat hook with rubber buffer	630	No		
R	Rubber door stop; floor mounting	683	No		
S	Bathroom locks with indicator bolts; Union No. 2226	472	No		
T	Overhead door closer Briton No. 2003	10	No		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
A	Two lever mortice locks and brass sets lever handle furniture	171	No		
	METAL WORK				
	PURPOSE MADE UNITS				
	Doors and gates				
	Mild steel double door in equal leaves; 50 x 50 x 3 mm thick Z-section frame all round, built into wall with 200 mm long 20 x 20 x 2 mm thick fishtailed lugs; comprising 50 x 50 x 3 mm thick hollow section stiles, top and bottom rails; 4 No. 25 x 25 x 2 mm thick horizontal infills and 4 No. 25 x 25 x 2 mm thick vertical infill; with 1 No 200mm wide horizontal middle and 1 No 250mm wide horizontal bottom solid panels faced both sides with 16 gauge sheet in panels, welded to frame; with and including all necessary mild steel sections for glazed section for small pane glass (m/s); all welding ground to smooth finish				
B	Door type D5; overall size 1400 x 2500 mm high; double door in equal leaves; 1 No. 3 lever mortice deadlocks Union Catalogue No. 2101; 1 No. pull handles Union catalogue No.5562; 1 No. escutcheons Union catalogue No. 5390; 1 No. 12 mm drop bolt in 4 mm thick steel sleeves; 1 No. 12 mm diameter 300 mm long slide bolt assembly with 4 mm thick steel hasp and padlock all welded	1	No		
C	Door type D6; overall size 2200 x 2500 mm high; double door in equal leaves; 1 No. 3 lever mortice deadlocks Union Catalogue No. 2101; 1 No. pull handles Union catalogue No.5562; 1 No. escutcheons Union catalogue No. 5390; 1 No. 12 mm drop bolt in 4 mm thick steel sleeves; 1 No. 12 mm diameter 300 mm long slide bolt assembly with 4 mm thick steel hasp and padlock all welded	1	No		
D	Door type D7; overall size 1400 x 2250 mm high; double door in equal leaves; 1 No. 3 lever mortice deadlocks Union Catalogue No. 2101; 1 No. pull handles Union catalogue No.5562; 1 No. escutcheons Union catalogue No. 5390; 1 No. 12 mm drop bolt in 4 mm thick steel sleeves; 1 No. 12 mm diameter 300 mm long slide bolt assembly with 4 mm thick steel hasp and padlock all welded	1	No		
E	Door type D8; overall size 1200 x 2250 mm high; double door in equal leaves; 1 No. 3 lever mortice deadlocks Union Catalogue No. 2101; 1 No. pull handles Union catalogue No.5562; 1 No. escutcheons Union catalogue No. 5390; 1 No. 12 mm drop bolt in 4 mm thick steel sleeves; 1 No. 12 mm diameter 300 mm long slide bolt assembly with 4 mm thick steel hasp and padlock all welded	1	No		
F	Door type D8; overall size 1800 x 2250 mm high; double door in equal leaves; 1 No. 3 lever mortice deadlocks Union Catalogue No. 2101; 1 No. pull handles Union catalogue No.5562; 1 No. escutcheons Union catalogue No. 5390; 1 No. 12 mm drop bolt in 4 mm thick steel sleeves; 1 No. 12 mm diameter 300 mm long slide bolt assembly with 4 mm thick steel hasp and padlock all welded	4	No		
G	Door type D9; overall size 2000 x 2250 mm high; double door in equal leaves; 1 No. 3 lever mortice deadlocks Union Catalogue No. 2101; 1 No. pull handles Union catalogue No.5562; 1 No. escutcheons Union catalogue No. 5390; 1 No. 12 mm drop bolt in 4 mm thick steel sleeves; 1 No. 12 mm diameter 300 mm long slide bolt assembly with 4 mm thick steel hasp and padlock all welded	2	No		
	GLAZING				
	GLASS IN OPENINGS				
	Sheet; clear				
	4 mm thick to wood with wooden beads (m/s)				
H	In panes 0.10 to 0.50 square metres	103	sm		
	4 mm thick to metal with putty glazing compound				
J	In panes 0.10 to 0.50 square metres	40	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	Georgian wired; polished				
	6 mm thick to wood with wooden beads (m/s)				
A	In panes 0.10 to 0.50 square metres	4	sm		
	PAINTING AND DECORATING				
	PREPARE AND APPLY ONE COAT PINK OR WHITE HARDWOOD PRIMER; TO CROWN 'SOLO' PAINTS OR EQUAL AND APPROVED				
	To backs of timber surfaces before fixing				
	Frames or the like				
B	100 to 200 mm girth; internal	3,720	lm		
	Prepare and apply one coat calcium plumbate primer;two undercoats;two coats oil gloss paint full gloss finish:supplied by Messrs Crown Paint Kenya Ltd .Or other equal and approved;applied in strict accordance with the manufacturer's printed instructions ;all to the architect's approval				
	Metal surfaces				
	Metal door and grille surfaces				
C	Over 300 mm girth; internal	59	sm		
D	Over 300 mm girth; external	21	sm		
	PREPARE AND APPLY ONE COAT APPROVED STAIN; THREE COATS 2-PACK MATT POLYURETHANE VARNISH; TO CROWN 'SOLO' PAINTS OR EQUAL AND APPROVED				
	Timber surfaces				
	Frames or the like				
E	Not exceeding 100 mm girth; internal	1,225	lm		
F	100 to 200 mm girth; internal	7,441	lm		
G	200 to 300 mm girth; internal	3,720	lm		
H	Over 300 mm girth; internal	197	sm		
	Doors				
J	Over 300 mm girth; internal	2,451	sm		
K	Over 300 mm girth; external	45	sm		

Ref.	Description	Kshs/Cts
	DOORS	
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	Page No. 22	
	Page No. 23	
646	Male Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	EXTERNAL WALL FINISHES				
	FLOOR, WALL AND CEILING FINISHES				
	INSITU FINISHINGS				
	Plaster; 15 mm first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5); steel trowelled; with and including Sika 1 or other equal and approved waterproofing compound; to B.S 6920				
	18 mm thick; to concrete or blockwork base (m/s); generally to				
A	Walls; external	282	sm		
	Plaster; 15 mm first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5); steel trowelled				
	18 mm thick; to concrete or blockwork base (m/s); generally to				
B	Sides and soffities of beams; external	8	sm		
C	Walls; external	3,904	sm		
	PAINTING AND DECORATING				
	Prepare and apply two undercoats ;two finishing coats Permacote Ultraguard with Silicone Paint;supplied by Messrs Crown Paints Kenya Ltd,Or other equal and approved ; applied in strict accordance with manufacturer's printed instruction;all to architect's approval				
	Steel trowelled plastered surfaces				
	Walls				
D	Over 300 mm girth; external	4,186	sm		
	Sides and soffites of beams				
E	Over 300 mm girth; external	8	sm		

Ref.	Description	Kshs/Cts
	EXTERNAL WALL FINISHES Page No. 25	
646	Male Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	INTERNAL WALL FINISHES				
	FLOOR, WALL AND CEILING FINISHES				
	INSITU FINISHINGS				
	Plaster; 15 mm first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5); steel trowelled				
	18 mm thick; to concrete or blockwork base (m/s); generally to				
A	Sides of beams; internal	223	sm		
B	Walls; internal	16,105	sm		
	TILE, SLAB OR BLOCK FINISHINGS				
	Ceramic tiles; as manufactured by Messrs. Saj Ceramics or other equal and approved; glazed wall tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement; with and including any necessary plastic edge or corner strips and accessories				
	600 x 300 x 6 mm; butt joints straight both ways; to cement and sand base (m/s); generally to				
C	Walls; internal	4,913	sm		
	BEDS OR BACKINGS				
	Render; cement and sand (1:4)				
	15 mm thick one coat backings with and including Sika 1 or other equal and approved waterproofing compound; to B.S 6920; to receive ceramic tiles (m/s); to concrete or blockwork base; generally to				
D	Walls; internal	4,913	sm		
	PAINTING AND DECORATING				
	PREPARE AND APPLY TWO UNDERCOATS; TWO COATS SILK VINYL EMULSION PAINT; TO CROWN 'SOLO' PAINTS OR EQUAL AND APPROVED				
	Steel trowelled plastered surfaces				
	Walls				
E	Over 300 mm girth; internal	16,105	sm		
	Sides and soffites of beams				
F	Over 300 mm girth; internal	223	sm		

Ref.	Description	Kshs/Cts
	INTERNAL WALL FINISHES Page No. 27	
646	Male Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	FLOOR FINISHES				
	FLOOR, WALL AND CEILING FINISHES				
	TILE, SLAB OR BLOCK FINISHINGS				
	Ceramic tiles; as manufactured by Messrs. Saj Ceramics or other equal and approved; non-slip glazed floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement				
	600 x 300 x 8 mm; butt joints straight both ways; to cement and sand base (m/s); generally to				
A	Floors; level; internal	6,116	sm		
B	Skirtings; 100 x 8 mm thick; internal	4,901	lm		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	42 mm thick one coat beds; wood floated; to receive ceramic tiles (m/s); to existing concrete or blockwork base; generally to				
C	Floors; level; internal	5,172	sm		
	42 mm thick one coat beds; with and including Sika 1 or other equal and approved waterproofing compound to B.S 6920; wood floated; to receive ceramic tiles (m/s); to existing concrete or blockwork base; generally to				
D	Floors; level; internal	945	sm		

Ref.	Description	Kshs/Cts
	FLOOR FINISHES Page No. 29	
646	Male Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	CEILING FINISHES				
	FLOOR, WALL AND CEILING FINISHES				
	INSITU FINISHINGS				
	Plaster; 12 mm first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5); steel trowelled				
	15 mm thick 2 No. coat work; to concrete or blockwork base (m/s); generally to				
A	Ceilings; internal	6,060	sm		
	PAINTING AND DECORATING				
	PREPARE AND APPLY TWO UNDERCOATS; TWO COATS VINYL MATT EMULSION PAINT; TO CROWN 'SOLO' PAINTS OR EQUAL AND APPROVED				
	Steel trowelled plastered surfaces				
	Ceilings				
B	Over 300 mm girth; internal	6,060	sm		

Ref.	Description	Kshs/Cts
	CEILING FINISHES Page No. 31	
646	Male Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	STAIRCASE FINISHES				
	METAL WORK				
	PURPOSE MADE UNITS				
	Balustrading				
	Mild steel grab rail				
A	50 mm diameter x 3 mm circular hollow section handrail; fixed to tops or sides of wall with and including 20 x 20 x 3 mm rectangular hollow section tubes 300mm long at 450mm centres, one end fish-tailed and grouted in wall or concrete, the other end welded to handrail	264	lm		
	Mild steel balustrading				
B	1100 mm high horizontal or raking balustrading; comprising 60mm diameter x 3mm circular hollow section handrail including and welded to ends of 1000mm long 50 x50 x 3mm rectangular hollow section balusters at 2000mm centres, one end fish-tailed and grouted in concrete and the other welded to handrail; with and including 20 x 20 x 3mm rectangular hollow section patterned horizontal, vertical and raking infill members welded to balusters and to each other at 200mm (average) centres; all balusters welded to 75 x 50 x 4mm RHS top and bottom horizontal rails	295	lm		
	FLOOR, WALL AND CEILING FINISHES				
	INSITU FINISHINGS				
	Terrazzo; approved colour; cement and local marble chippings (1:2); machine polished				
	25 mm thick, 1 No. coat work to concrete, blockwork or brickwork base (m/s); generally to				
C	Quarter-space or half-space landing; internal	29	sm		
D	Extra; Plastic dividing strips; 50 x 6 mm; including setting to approved patterns in wet cement and sand mortar (m/s)	174	lm		
E	Extra; Aluminium dividing strips; 50 x 6 mm; including setting to approved patterns in wet cement and sand mortar (m/s)	174	lm		
F	Treads; 300 mm wide; one rounded nosing; internal	240	lm		
G	Extra; Non-slip inserts; carborundum; 50 x 10 mm	240	lm		
H	Risers; 150 mm high; one coved junction with floor; internal	240	lm		
J	Skirting; 100 mm wide; rounded junction with wall finish and coved junction with floor; internal	90	lm		
	Plaster; 15 mm first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5); wood floated hard and smooth to finish				
	18 mm thick; to concrete or blockwork base (m/s); generally to				
K	Sloping soffites of stairs and landings; internal	182	sm		
L	Edges of staircase strings; over 300 mm wide; internal	45	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	TILE, SLAB OR BLOCK FINISHINGS				
	Ceramic tiles; as manufactured by Messrs. Saj Ceramics or other equal and approved; non-slip glazed floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement				
	600 x 300 x 8 mm; butt joints straight both ways; to cement and sand base (m/s); generally to				
A	Quarter-space or half-space, landings; internal	23	sm		
B	Treads; 300 mm wide; internal	150	lm		
C	Risers; 150 mm high; internal	150	lm		
D	Skirtings; 100 x 8 mm thick; internal	45	lm		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:3)				
	25 mm thick one coat beds; wood floated; to receive Terrazzo (m/s); to concrete or blockwork base; generally to				
E	Quarter-space or half-space landings; internal	29	sm		
F	Treads; 300 mm wide; internal	240	lm		
G	Risers; 150 mm high; internal	240	lm		
	Screed; cement and sand (1:4)				
	25 mm thick one coat beds; wood floated; to receive Ceramic Tiles (m/s); to concrete or blockwork base; generally to				
H	Quarter-space or half-space landings; internal	23	sm		
J	Treads; 300 mm wide; internal	150	lm		
K	Risers; 150 mm high; internal	150	lm		
	PAINTING AND DECORATING				
	PREPARE AND APPLY TWO UNDERCOATS; THREE COATS VINYL MATT EMULSION PAINT; TO CROWN 'SOLO' PAINTS OR EQUAL AND APPROVED				
	Steel trowelled plastered surfaces				
	Staircase soffites				
L	Over 300 mm girth; internal	132	sm		
	Staircase strings				
M	Over 300 mm girth; internal	73	sm		
	Prepare and apply one coat calcium plumbate primer;two undercoats;two coats oil gloss paint full gloss finish:supplied by Messrs Crown Paint Kenya Ltd .Or other equal and approved;applied in strict accordance with the manufacturer's printed instructions ;all to the architect's approval				
	Metal surfaces				
	Balustrading				
N	Over 300 mm girth; measured flat overall; internal	649	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	Mild steel Grab rail				
A	200 to 300 mm girth; internal	264	lm		

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Ref.	Description	Kshs/Cts
	STAIRCASE FINISHES	
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Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	JOINERY FITTINGS				
	JOINERY				
	GENERAL JOINERY				
	Wrot Mahogany; prime grade; selected				
	Expansion joint cover				
A	100 x 25 mm thick	44	lm		
	JOINERY FITTINGS				
	THE FOLLOWING IN UTILITY COUNTERTOPS (PROVISIONAL)				
	Concrete work				
	Vibrated reinforced concrete; 1:2:4 - 20 mm aggregate				
B	75 mm thick; suspended worktop	26	sm		
	Mesh fabric reinforcement; B.S. 4483				
C	BRC Reference A 142; mesh weight 2.2 kgs per square metre (measured net - no allowance made for 150 mm laps); including bends, tying wire, distance blocks and the like; to suspended worktop or shelf	26	sm		
	Sawn formwork				
D	Edges of suspended worktop; not exceeding 75 mm high	44	lm		
E	Soffites of suspended worktop	26	sm		
F	Extra over; temporary boxing to form 600 x 450 mm wide opening	38	No		
	Beds and backings				
	Cement and sand backing; wood floated hard and smooth to receive terrazzo worktop;				
G	25 mm thick to worktop	26	sm		
H	100 mm high x 25 mm thick to worktop	44	lm		
	Tiled or block finishes				
	Terrazzo; approved colour; cement and local marble chips (1:2); washed; in 1 coat to and including cement and sand base; generally to				
J	2.5 mm thick; to counter top	26	sm		
K	100 x 25 mm thick; to edges of worktops; with and including rounded edge	44	lm		
	PAINTING AND DECORATING				
	PREPARE AND APPLY ONE COAT APPROVED STAIN; THREE COATS 2-PACK MATT POLYURETHANE VARNISH; TO CROWN 'SOLO' PAINTS OR EQUAL AND APPROVED				
	Timber surfaces				
	Expansion joint cover				
L	100 to 200 mm girth; internal	44	lm		

Ref.	Description	Kshs/Cts
	JOINERY FITTINGS Page No. 37	
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Ref.	Description	Kshs/Cts
	Summary	
	SUBSTRUCTURES (ALL PROVISIONAL)	
	REINFORCED CONCRETE FRAME	
	EXTERNAL AND INTERNAL WALLS	
	ROOF CONSTRUCTION, COVERING AND RAINWATER DISPOSAL	
	WINDOWS	
	DOORS	
	EXTERNAL WALL FINISHES	
	INTERNAL WALL FINISHES	
	FLOOR FINISHES	
	CEILING FINISHES	
	STAIRCASE FINISHES	
	JOINERY FITTINGS	
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BILL No. 3

HOSTEL BLOCK - GIRLS

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	SUBSTRUCTURES (ALL PROVISIONAL)				
	EXCAVATION AND EARTHWORK				
	EXCAVATION				
	Excavating				
	Bulk excavation to remove black cotton soil				
A	Over 300 mm deep; not exceeding 1.50 m deep	2,431	cm		
B	Over 300 mm deep; 1.50 m to 3.00 m deep	810	cm		
	Extra over all kinds of excavations for				
C	Excavating in rock irrespective of hardness or depth	2,096	cm		
	Disposal				
	Surplus excavated material				
D	Removing from site	3,241	cm		
	FILLING				
	Hardcore				
	Filling in making up levels well rolled and compacted to 100% maximum dry density				
E	Over 300mm thick; handpacked; in layers maximum 150 mm thick	2,816	cm		
	Take from store hardcore arising from demolished structures; fill in to make up levels, well roll and compact to 95% maximum dry density				
F	Over 300mm thick; handpacked; in layers maximum 150 mm thick	2,316	cm		
	Stone or quarry dust				
	Blinding surfaces of fill				
G	50 mm thick; compacted to approval to receive damp proofing membrane (m/s)	1,310	sm		
	DAMP PROOFING MEMBRANES				
	1000 Gauge 'diothene' or other equal and approved polythene sheeting damp proofing membrane; with welted laps (measured net - no allowance made for laps)				
	Horizontal; in 1 No. layer(s)				
H	Over 300mm wide; laid on compacted murram or quarry dust blinding (measured separately)	1,481	sm		
	ANTI-TERMITE AND HERBICIDE TREATMENT				
	Premise 200 SC Chemical anti termite treatment manufactured by Bayer Environmental Science or other equal and approved insecticide; applied strictly in accordance with the Manufacturer's printed instructions;				
	Application to be carried out by an approved specialist; with and including a Ten years written guarantee; Tender rate shall allow within the unit rate build up for treating vertical sides of foundation trenches, column base pits and around building plinth as quantity indicated herein is measured flat overall on net ground floor surface beds; all to the Architect's approval				
J	To surfaces of fill and tops of foundation walls	1,481	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	CONCRETE WORK				
	INSITU CONCRETE: PLAIN				
	Normal: mass concrete (1:3:6 mix / 20mm aggregate)				
	Blinding				
A	50 mm thick	842	sm		
	INSITU CONCRETE: REINFORCED				
	Normal: class 25/(20mm): vibrated				
	Foundations in trenches				
B	Generally	17	cm		
	Column bases				
C	Generally	438	cm		
	Ground beams and the like				
D	Generally	43	cm		
	Columns: vertical or sloping not exceeding 15 degrees from horizontal				
E	Generally	69	cm		
	Steps				
F	Generally	6	cm		
	Beds laid in bays not exceeding 35 square metres; including formwork between bays				
G	100 mm thick	1,281	sm		
	Ramps				
H	100 mm thick; sloping not exceeding 15 degrees from horizontal	52	sm		
	Walls				
J	200 mm thick	45	sm		
	REINFORCEMENT				
	Bars; high yield deformed steel; cold worked and ribbed to B.S. 4449 including bends, hooks, tying wire, distance blocks, spacers and the like				
	In any location				
K	25 mm Diameter	7,719	kg		
L	20 mm Diameter	4,298	kg		
M	16 mm Diameter	24,019	kg		
N	12 mm Diameter	20,899	kg		
P	10 mm Diameter	15,408	kg		
Q	8 mm Diameter	6,667	kg		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	Fabric				
	Steel wire fabric mesh reinforcement to B.S. 4483 Ref: A 252 and K.S. 02-18:1976; weighing 3.95 kg per square metre (measured net - no allowance made for minimum 300mm laps); including tying and supporting as required				
A	In any location	1,306	sm		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Risers of steps and staircase				
B	75 to 150 mm wide	41	lm		
	Edges of staircase string; cutting to profile of steps				
C	225 to 300 mm wide	25	lm		
	Edges of beds, roads, footpaths, pavings and the like				
D	75 to 150 mm wide	374	lm		
	Sides; vertical or battering				
E	Walls or the like	179	sm		
F	Columns	683	sm		
G	Ground beams	425	sm		
H	Foundations	55	sm		
J	Column bases	491	sm		
	CONCRETE SUNDRIES				
	Labour and material				
	Water bars; standard plasticised PVC bulb-edged strip				
K	200 mm wide; as Sika V-20L or other equal and approved; set in concrete as the works proceed	11	lm		
	WALLING				
	NATURAL STONEWORK				
	Approved local stone; squared; bedding and jointing in cement mortar (1:4)				
	Walls				
L	200 mm thick; reinforced with hoop iron gauge 500 in every alternative course; with a minimum compressive strength of 7 Newton/square millimetre	650	sm		
M	Fair raking cutting	48	lm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	WALLING SUNDRIES				
	Labour and material				
	Metal cramps				
A	No. 16 B.W.G fixing cramps; 25mm wide x 450mm girth; one end cast into and including mortice in existing concrete and properly secured to existing reinforcement and the other end built into joints of walling	1,404	No		
	EXPANSION JOINTS				
	Expansion joint filler				
	'Flexcell' or other equal and approved expansion joint filler; applied in strict accordance with Manufacturer's printed instruction and to the Architect's approval				
B	Over 300mm to walls or concrete including any necessary formwork	28	sm		
C	Rake out expansion joint filler to form 10x25mm wide groove; fill groove with approved mastic filler	7	lm		
	WATERPROOFING WORK				
	WATERPROOFING				
	Sika 1 or other equal and approved waterproofing compound; to B.S 6920				
	Applied in strict accordance with the Manufacturer's printed instructions; at the minimum rate of 9 litres per cubic metres ; including issuing a Twenty (20) year guarantee				
D	Walls	90	sm		
	FLOOR, WALL AND CEILING FINISHES				
	INSITU FINISHINGS				
	Plaster; 12 mm first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5); wood floated hard and smooth to finish				
	25 mm thick 2 No. coat work; to concrete or blockwork base (m/s); generally to				
E	Walls; plinths; external	239	sm		
	PAINTING AND DECORATING				
	3 COAT(S) BLACK BITUMASTIC PAINT; TO CROWN PAINTS OR EQUAL AND APPROVED				
	Wood floated rendered surfaces				
	Walls				
F	Over 300 mm girth; external	239	sm		
	DRAINAGE				
	THE FOLLOWING IN BULK WATER STORAGE TANK(S)				
	Excavating				
	Bulk excavation to remove black cotton soil				
G	Not exceeding 1.50 m deep	329	cm		
H	1.50 to 3.00 m deep	110	cm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	Extra over all kinds of excavations irrespective of depth for				
A	Excavating in rock irrespective of hardness	220	cm		
	Disposal				
	Surplus excavated material				
B	Removing from site	439	cm		
	Filling				
	Approved hardcore filling				
C	Filling depositing and compacting to 100% B.S.S. compaction in layers maximum 150 mm thick; over 300mm thick	390	cm		
D	300 mm thick filling depositing and compacting to 100% B.S.S. compaction in layers maximum 150 mm thick	55	sm		
	Stone or quarry dust				
E	50 mm thick blinding to surfaces to fill; compacted to approval	185	sm		
	Insitu concrete reinforced; normal; class 25/(20 mm) ; vibrated				
	Hollow Block Suspended Construction				
	Ribs and topping concrete class 25/(20 mm); precast concrete hollow blocks size 400 x 230 x 300 mm high in rows at 450 mm centres from an approved manufacturer; 150 mm wide ribs; 100 mm thick topping concrete; vibrated				
F	Suspended floors; roofs or the like; 400mm thick overall	164	sm		
	Insitu concrete reinforced; guaranteed strength; Class 30/(20 mm) ; vibrated				
	Tank base				
G	250 mm thick	200	sm		
	Beams				
H	Generally	8	sm		
	Walls				
J	250 mm thick	219	sm		
	Sump base				
K	250 mm thick	1	sm		
	Sump walls				
L	250 mm thick	1	sm		
	Formwork to insitu concrete; formwork generally; removing through constrained space or opening				
	Soffites; horizontal				
M	Suspended cover slabs; strutting 3.50 to 5.00 m high	164	sm		
	Sides; vertical				
N	Walls or the like	439	sm		
P	sump walls	3	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	Sides and soffites				
A	Beams or the like; strutting 3.50 to 5.00 m high	49	sm		
	Edges of base slabs				
B	225 to 300 mm high	4	lm		
	Edges of suspended floors or the like				
C	Over 300mm wide	49	sm		
	Reinforcement; bars; high yield deformed steel; cold worked and ribbed to B.S. 4449 including bends, hooks, tying wire, distance blocks, spacers and the like				
	In any location				
D	16 mm diameter	789	kg		
E	12 mm diameter	5,415	kg		
F	10 mm diameter	12,407	kg		
G	8 mm diameter	2,878	kg		
	Reinforcement; fabric; B.S. 4483				
	Reference A 252; mesh 200 x 200 mm; weight 3.95 kgs per square metre; 200 mm end laps; 200 mm side laps				
H	In any location	164	sm		
	Coated cast iron double seal access covers and frames; B.S. 497				
	Bedding frames in cement mortar (1:4); haunching in plain concrete (1:3:6) where necessary; bedding covers in grease and sand				
J	450 x 450 mm; heavy duty	1	No		
K	600 x 450 mm; heavy duty	1	No		
	Service pipework to B.S. 1387; Class B; galvanised mild steel; medium grade; screwed and socketted; galvanised mild steel screwed fittings to B.S. 1256				
	Vent pipe				
L	100 mm diameter; with and including appropriate water seal sleeve and puddle flange	2	lm		
M	Extra; bend with and including fixing mosquito wire gauze as approved	4	No		
N	Equal tee	2	No		
	Plaster; cement and sand (1:3); with 5% 'Pudlo' or other equal and approved waterproofing compound; steel trowelled hard and smooth to finish				
	25 mm thick; to concrete or blockwork base; generally to				
P	Walls	421	sm		
Q	Soffites; horizontal	49	sm		
	Screed; cement and sand (1:3); with and including an approved waterproofing compound; steel trowelled hard and smooth to finish				
	75 mm thick; to concrete or blockwork base; generally to				
R	Floors; level	185	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
A	Extra; forming 75 x 75 mm triangular fillet	62	lm		
	Sika 1 or other equal and approved waterproofing compound				
	Applied in strict accordance with manufacturer's printed instructions; including issuing a Ten year warranty				
B	Walls	439	sm		
C	Applied to tank base	200	sm		
	Sundries				
	Walls				
D	200 mm wide Sika V-20L plasticised PVC waterbar set in concrete (m/s) as the works proceed	60	lm		
	Stainless steel				
	Cat ladders				
E	450 mm wide; constructed of 40 x 4mm mild steel flats welded to each other at 40mm cross-centres both ways; including setting in grease to and including 50 x 50 x 6 mm angle frame all round fixed to concrete (m/s) with and including 100 mm long x 10 mm diameter round bar lugs one end welded to frame, the other end fishtailed and grouted into and including mortice in concrete at 300 mm centres; including painting all metal work with 3 coats of approved bituminous paint	7	lm		

Ref.	Description	Kshs/Cts
	SUBSTRUCTURES (ALL PROVISIONAL)	
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646	Female Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	REINFORCED CONCRETE FRAME				
	CONCRETE WORK				
	INSITU CONCRETE: REINFORCED				
	Normal: class 25/(20mm): vibrated				
	Beams; horizontal or sloping not exceeding 15 degrees from horizontal				
A	Generally	310	cm		
	Columns: vertical or sloping not exceeding 15 degrees from horizontal				
B	Generally	169	cm		
	Suspended staircase ; sloping exceeding 15 degrees from horizontal				
C	Generally	70	cm		
	Suspended floors, roofs or the like; horizontal				
D	150 mm thick	6,278	sm		
E	200 mm thick	152	sm		
	Walls				
F	200 mm thick	182	sm		
	Suspended landings				
G	200 mm thick	51	sm		
	HOLLOW BLOCK SUSPENDED CONSTRUCTION				
	Ribs and topping concrete class 25/(20 mm); precast concrete hollow blocks size 400 x 230 x 300 mm high in rows at 450 mm centres from an approved manufacturer; 150 mm wide ribs; 100 mm thick topping concrete; vibrated				
	Suspended floors, roofs or the like;				
H	400 mm thick overall	508	sm		
	REINFORCEMENT; ALL PROVISIONAL				
	Bars; high yield deformed steel; cold worked and ribbed to B.S. 4449 including bends, hooks, tying wire, distance blocks, spacers and the like				
	In any location				
J	25 mm Diameter	4,014	kg		
K	20 mm Diameter	10,035	kg		
L	16 mm Diameter	45,212	kg		
M	12 mm Diameter	20,941	kg		
N	10 mm Diameter	105,286	kg		
P	8 mm Diameter	46,721	kg		
	In any location; curved on plan to various radii				
Q	16 mm Diameter	19	kg		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	Fabric				
	Steel wire fabric mesh reinforcement to B.S. 4483 Ref: A 252 and K.S. 02-18:1976 in hollow pot slab (m/s) (measured net - no allowance made for minimum 300mm laps); weighing 3.95 kg per square metre; including tying and supporting as required				
A	In any location	508	sm		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Soffits; horizontal				
B	Suspended floor slabs	6,330	sm		
C	Suspended landings	51	sm		
	Soffites; sloping				
D	Suspended staircases and the like	131	sm		
	Edges of suspended slab				
E	75 to 150 mm wide	1,263	lm		
F	150 to 225 mm wide	59	lm		
G	Over 300mm wide	208	sm		
	Edges of suspended landing				
H	150 to 225 mm wide	117	lm		
	Risers of steps and staircase				
J	75 to 150 mm wide	390	lm		
	Edges of staircase string; cutting to profile of steps				
K	Over 300mm wide	100	sm		
	Sides; vertical or battering				
L	Walls or the like	365	sm		
M	Columns	2,043	sm		
	Sides and soffites				
N	Beams or the like; horizontal	3,055	sm		
	Soffites; curved on plan to various radii				
P	Beams or the like; horizontal	4	sm		
	WALLING				
	EXPANSION JOINTS				
	Expansion joint filler				
	'Flexcell' or other equal and approved expansion joint filler; applied in strict accordance with Manufacturer's printed instruction and to the Architect's approval				
Q	Over 300mm to walls or concrete including any necessary formwork	132	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
A	Rake out expansion joint filler to form 10x25mm wide groove; fill groove with approved mastic filler	44	lm		

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Ref.	Description	Kshs/Cts
	REINFORCED CONCRETE FRAME	
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Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	EXTERNAL AND INTERNAL WALLS				
	CONCRETE WORK				
	PRECAST CONCRETE				
	Normal; class 20/(20mm); vibrated				
	Lintels				
A	150 mm wide x 450 mm high; reinforced with 4 No. 12 mm diameter high yield deformed bar reinforcement hooked on ends and with 8mm diameter links at 200mm centres hooked on ends for appropriate anchorage; with and including all appropriate tying wires, spacer blocks and the like	601	lm		
B	200 mm wide x 300 mm high; reinforced with 4 No. 12 mm diameter high yield deformed bar reinforcement hooked on ends and with 8mm diameter links at 200mm centres hooked on ends for appropriate anchorage; with and including all appropriate tying wires, spacer blocks and the like	3	lm		
	Normal; class 20/(20 mm); vibrated; surface fair finish				
	Copings				
C	300 x 75 mm ; once sunk weathered; once throated; reinforced as necessary for handling; surface finish 650 mm girth; bedding, jointing and pointing in cement mortar (1:4)	305	lm		
	WALLING				
	NATURAL STONEWORK				
	Approved local stone; machine cut; bedding and jointing in cement mortar (1:3); with a minimum compressive strength of 7N per square millimetre				
	Walls				
D	100 mm thick; reinforced with hoop iron gauge 500 in every alternative course	1,088	sm		
E	Fair raking cutting	224	lm		
F	150 mm thick; reinforced with hoop iron gauge 500 in every alternative course	5,882	sm		
G	200 mm thick; reinforced with hoop iron gauge 500 in every alternative course	3,894	sm		
	WALLING SUNDRIES				
	Labour and material				
	Metal cramps				
H	No. 16 B.W.G fixing cramps; 25mm wide x 450mm girth; one end cast into and including mortice in existing concrete and properly secured to existing reinforcement and the other end built into joints of walling	5,332	No		
	DAMP PROOF COURSES				
	B.S. 743; type A; Hessian based 3 ply bituminous felt; 150 mm laps;				
	Horizontal; 1 No of layer(s); (measured overall - no allowance made for laps); laid and bedded on levelled cement mortar (1:3)				
J	100mm wide	68	lm		
K	150mm wide	479	lm		
L	200mm wide	397	lm		

Ref.	Description	Kshs/Cts
	EXTERNAL AND INTERNAL WALLS Page No. 13	
646	Female Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	ROOF CONSTRUCTION, COVERING AND RAINWATER DISPOSAL				
	WATERPROOFING WORK				
	GENERAL WATERPROOFING WORKS				
	APP Membranes				
	Sirrah PGR 4 or other equal and approved; supplied by Messrs. Italbuild Imports Ltd; weighing 4 kg/sm; multi-layered with ceramic chip finish; flame applied and bonded to concrete or blockwork (m/s); vertical or sloping exceeding 15 degrees				
A	Over 300mm wide; to floors	1,471	sm		
B	Extra over; dressing over rainwater outlet (m/s)	8	No		
C	300 mm wide to walls; including dressing into and including 50 x 50mm mortice cut into concrete or blockwork and casting with gauged mortar	312	lm		
	PLUMBING AND DRAINAGE INSTALLATIONS				
	RAINWATER INSTALLATIONS				
	Pipework; Unplasticised P.V.C. to B.S. 5481; Heavy gauge				
	Pipes; soldered connections in the running length; fixing with approved galvanized mild steel holderbats at appropriate centres to backgrounds				
D	100 mm diameter	148	lm		
E	Extra; Horse shoe bend	8	No		
F	Extra; Swanneck bend	8	No		
	Rainwater fittings; cast aluminium				
	Roof outlets; : "fulbora" type; joints to pipes				
G	200 mm diameter; cast into concrete slab	8	No		
	FLOOR, WALL AND CEILING FINISHES				
	TILE, SLAB OR BLOCK FINISHINGS				
	Precast concrete interlocking tiles as manufactured by Messrs Mitchell Cotts Kenya Ltd. or other equal and approved; to regular pattern; bedding, jointing and pointing in cement mortar (1:4)				
	250 x 250 x 15 mm; butt joints straight both ways; on and including 40 mm sand bed; generally to				
H	Floors; to falls, crossfalls or sloping not exceeding 15 degrees from horizontal; internal	1,355	sm		
J	Skirtings; 150 x 15 mm thick; internal	312	lm		
	BEDS OR BACKINGS				
	Render; cement and sand (1:4)				
	15 mm thick one coat backings; steel trowelled to a smooth surface to receive waterproofing (m/s); to concrete or blockwork base; generally to				
K	Walls; external	103	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	Lightweight screed; cement and vermiculite aggregate (1:8); 12 mm cement and sand (1:4) toping; with and including an approved waterproofing to the satisfaction of the Architect				
	75 mm thick (average) one coat beds; wood floated to falls and crossfalls; to receive waterproofing compound (m/s); to concrete or blockwork base; generally to				
A	Floors; to falls, crossfalls or sloping not exceeding 15 degrees from horizontal; internal	1,355	sm		
B	50 x 50 mm triangular fillet	312	lm		

Ref.	Description	Kshs/Cts
	ROOF CONSTRUCTION, COVERING AND RAINWATER DISPOSAL	
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646	Female Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	WINDOWS				
	CONCRETE WORK				
	PRECAST CONCRETE				
	Normal; class 20/(20 mm); vibrated; surface fair finish				
	Sills				
A	300 x 75 mm ; once sunk weathered; once throated; reinforced as necessary for handling; surface finish 700 mm girth; bedding, jointing and pointing in cement mortar (1:4)	469	lm		
	JOINERY				
	IRONMONGERY				
	Accessories				
	Curtain rods; solid wrought iron patterned to approval; each curtain rod fixed with and including 2 No. decorative wrought iron decorative sphere finial and appropriate end brackets; fixing with chromium plated screws to backgrounds requiring plugging				
B	20 mm diameter	379	lm		
C	25 mm diameter	379	lm		
	METAL WORK				
	SHEET METAL				
	Mild steel				
	Decorative window cladding				
D	2mm, machine cut to approved pattern; welded to approval including all necessary ironmongery horizontally and 75x50x3mm thick frame all round grinding and making smooth welds with and including silicon paint to approval; size 2050 x 2500 mm	64	no		
E	2mm, machine cut to approved pattern; welded to approval including all necessary ironmongery horizontally and 75x50x3mm thick frame all round grinding and making smooth welds with and including silicon paint; size 2050 x 2500 mm; with a semicircular top	16	no		
F	Curved cutting	12	lm		
	PURPOSE MADE UNITS				
	Composite extruded powder coated coloured (to Architect's approval) aluminium windows; constructed of standard hollow or angle sections with frames mitred at corners including reinforcing cleats; permanent ventilators full width; opening sections sliding; snap rubber glazing beads and sealing strips; and all necessary ironmongery horizontally with and including 50x50x3mm thick frame all round (Note: All windows to be constructed as per details attached in Appendix A at the end of this bill and to any further amplified details in the description or as may be provided by the Architect)				
	Fixing with appropriate screws to approval; plugging or fixing to concrete, blockwork or stone work; sealing with mastic; oiling and adjusting on completion				
G	Window type W1; size 1800 x 2200 mm high	170	No		
H	Window type W2; size 725 x 900 mm high	158	No		
J	Window type W3; size 1800 x 1800 mm high	5	No		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	Supply, assemble and fix the following purpose made powder coated anodised aluminium composite structural curtain walling in approved sections; complete with all sliding or hinged opening panels, coupling mullions, transomes, frames and handles, levers, finger pulls, pins, permanent ventilation with mosquito gauze wire, catches, stays, hinges, approved locking devices and any other necessary accessories where applicable; fixed at predetermined positions with the method of fixing to building structure to be done in strict accordance with the Architect's and Structural Engineer's specifications and approval; with and including preparing and submitting shop drawings and any revisions thereof prior to fixing to the Architect and Structural Engineer; including 'snap on' approved glazing beads; bedding frames in waterproof mastic asphalt externally; oiling, easing, adjusting and leaving the whole of curtaining walling structure in perfect structural and working order (glass m/s)				
	Fixing with appropriate screws to approval; plugging or fixing to concrete, blockwork or stone work; sealing with mastic; oiling and adjusting on completion				
A	Approved structural curtain walling; framework comprising horizontal mullions, cill and head and vertical stiles; all in approved sections; with approved section glazing beads (sample to be done to approval)	239	sm		
	JOINERY FITTINGS				
	THE FOLLOWING IN WINDOW BOARDS				
	Tiled or block finishes				
	Granite; polished; approved colour; fixing to concrete base (m/s) with an approved adhesive				
B	100 x 18 mm thick; to top of wall	392	lm		
	GLAZING				
	GLASS IN OPENINGS				
	Sheet; clear				
	4 mm thick to metal with putty glazing compound				
C	In panes 0.10 to 0.50 square metres	119	sm		
	Sheet; laminated				
	6 mm thick to metal with putty glazing compound				
D	In panes 0.10 to 0.50 square metres	925	sm		

Ref.	Description	Kshs/Cts
	WINDOWS	
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	Page No. 19	
646	Female Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	DOORS				
	JOINERY				
	DOORS				
	Wrot Mahogany; prime grade; selected				
	Framed frames and framings; all housed, cramped and glued together as necessary				
A	150 x 50 mm moulded frames; plugged	3,640	lm		
B	200 x 50 mm moulded frames; plugged	81	lm		
C	75 x 25 mm moulded architrave	7,441	lm		
D	25 x 25 mm moulded glazing beading	1,225	lm		
E	150 x 50 mm moulded transomes	469	lm		
F	200 x 50 mm moulded transomes	18	lm		
	Flush doors; B.S. 459 Part 2				
	Solid core; with and including panelled Mahogany veneered MDF laminate finish; hardwood lipping all edges; solid blocking for ironmongery				
G	Door Type D2 Single door; 45 mm thick ; 900 x 2100 mm high	159	No		
H	Door Type D3 Single door; 45 mm thick ; 800 x 2100 mm high	308	No		
J	Door Type D4 Single door; 45 mm thick ; 750 x 2100 mm high	158	No		
K	Door Type D7 Single door; 45 mm thick ; 1000 x 2100 mm high	6	No		
L	Door Type D10 Single door; 45 mm thick ; 900 x 2500 mm high	12	No		
	Solid core; fire escape door; with 1.5 hrs fire resistance; to Manufacturer's specifications and Architect's approval; Mahogany veneered plywood facing; hardwood lipping all edges				
M	Door Type D1 Double door; 45 mm thick ; 1800 x 2500 mm high; in two equal leaves	10	No		
	IRONMONGERY				
	Supply and fix the following ironmongery to timber complete with matching screws and keys as per 'UNION' manufacturers (reference to a particular catalogue are given as a guide to type and quality only, other equal and approved alternatives may be used)				
	To softwood, hardwood or the like fixing with screws				
N	Brass butt hinges; 100 x 50 mm; double washered	980	Prs		
P	3 Point locking push bar panic device; Union 882L-W; Stainless steel; with and including upper, lower and lateral Pullman latches; adjustable push bar; anti-thrust steel deadlatch; adjustable flat, corner and floor steel striking plates; and engraved fire sign	10	No		
Q	Brass coat and hat hook with rubber buffer	630	No		
R	Rubber door stop; floor mounting	683	No		
S	Bathroom locks with indicator bolts; Union No. 2226	472	No		
T	Overhead door closer Briton No. 2003	10	No		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
A	Two lever mortice locks and brass sets lever handle furniture	171	No		
	METAL WORK				
	PURPOSE MADE UNITS				
	Doors and gates				
	Mild steel double door in equal leaves; 50 x 50 x 3 mm thick Z-section frame all round, built into wall with 200 mm long 20 x 20 x 2 mm thick fishtailed lugs; comprising 50 x 50 x 3 mm thick hollow section stiles, top and bottom rails; 4 No. 25 x 25 x 2 mm thick horizontal infills and 4 No. 25 x 25 x 2 mm thick vertical infill; with 1 No 200mm wide horizontal middle and 1 No 250mm wide horizontal bottom solid panels faced both sides with 16 gauge sheet in panels, welded to frame; with and including all necessary mild steel sections for glazed section for small pane glass (m/s); all welding ground to smooth finish				
B	Door type D5; overall size 1400 x 2500 mm high; double door in equal leaves; 1 No. 3 lever mortice deadlocks Union Catalogue No. 2101; 1 No. pull handles Union catalogue No.5562; 1 No. escutcheons Union catalogue No. 5390; 1 No. 12 mm drop bolt in 4 mm thick steel sleeves; 1 No. 12 mm diameter 300 mm long slide bolt assembly with 4 mm thick steel hasp and padlock all welded	1	No		
C	Door type D6; overall size 2200 x 2500 mm high; double door in equal leaves; 1 No. 3 lever mortice deadlocks Union Catalogue No. 2101; 1 No. pull handles Union catalogue No.5562; 1 No. escutcheons Union catalogue No. 5390; 1 No. 12 mm drop bolt in 4 mm thick steel sleeves; 1 No. 12 mm diameter 300 mm long slide bolt assembly with 4 mm thick steel hasp and padlock all welded	1	No		
D	Door type D7; overall size 1400 x 2250 mm high; double door in equal leaves; 1 No. 3 lever mortice deadlocks Union Catalogue No. 2101; 1 No. pull handles Union catalogue No.5562; 1 No. escutcheons Union catalogue No. 5390; 1 No. 12 mm drop bolt in 4 mm thick steel sleeves; 1 No. 12 mm diameter 300 mm long slide bolt assembly with 4 mm thick steel hasp and padlock all welded	1	No		
E	Door type D8; overall size 1200 x 2250 mm high; double door in equal leaves; 1 No. 3 lever mortice deadlocks Union Catalogue No. 2101; 1 No. pull handles Union catalogue No.5562; 1 No. escutcheons Union catalogue No. 5390; 1 No. 12 mm drop bolt in 4 mm thick steel sleeves; 1 No. 12 mm diameter 300 mm long slide bolt assembly with 4 mm thick steel hasp and padlock all welded	1	No		
F	Door type D8; overall size 1800 x 2250 mm high; double door in equal leaves; 1 No. 3 lever mortice deadlocks Union Catalogue No. 2101; 1 No. pull handles Union catalogue No.5562; 1 No. escutcheons Union catalogue No. 5390; 1 No. 12 mm drop bolt in 4 mm thick steel sleeves; 1 No. 12 mm diameter 300 mm long slide bolt assembly with 4 mm thick steel hasp and padlock all welded	4	No		
G	Door type D9; overall size 2000 x 2250 mm high; double door in equal leaves; 1 No. 3 lever mortice deadlocks Union Catalogue No. 2101; 1 No. pull handles Union catalogue No.5562; 1 No. escutcheons Union catalogue No. 5390; 1 No. 12 mm drop bolt in 4 mm thick steel sleeves; 1 No. 12 mm diameter 300 mm long slide bolt assembly with 4 mm thick steel hasp and padlock all welded	2	No		
	GLAZING				
	GLASS IN OPENINGS				
	Sheet; clear				
	4 mm thick to wood with wooden beads (m/s)				
H	In panes 0.10 to 0.50 square metres	103	sm		
	4 mm thick to metal with putty glazing compound				
J	In panes 0.10 to 0.50 square metres	40	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	Georgian wired; polished				
	6 mm thick to wood with wooden beads (m/s)				
A	In panes 0.10 to 0.50 square metres	4	sm		
	PAINTING AND DECORATING				
	PREPARE AND APPLY ONE COAT PINK OR WHITE HARDWOOD PRIMER; TO CROWN 'SOLO' PAINTS OR EQUAL AND APPROVED				
	To backs of timber surfaces before fixing				
	Frames or the like				
B	100 to 200 mm girth; internal	3,720	lm		
	Prepare and apply one coat calcium plumbate primer;two undercoats;two coats oil gloss paint full gloss finish:supplied by Messrs Crown Paint Kenya Ltd .Or other equal and approved;applied in strict accordance with the manufacturer's printed instructions ;all to the architect's approval				
	Metal surfaces				
	Metal door and grille surfaces				
C	Over 300 mm girth; internal	59	sm		
D	Over 300 mm girth; external	21	sm		
	PREPARE AND APPLY ONE COAT APPROVED STAIN; THREE COATS 2-PACK MATT POLYURETHANE VARNISH; TO CROWN 'SOLO' PAINTS OR EQUAL AND APPROVED				
	Timber surfaces				
	Frames or the like				
E	Not exceeding 100 mm girth; internal	1,225	lm		
F	100 to 200 mm girth; internal	7,441	lm		
G	200 to 300 mm girth; internal	3,720	lm		
H	Over 300 mm girth; internal	197	sm		
	Doors				
J	Over 300 mm girth; internal	2,451	sm		
K	Over 300 mm girth; external	45	sm		

Ref.	Description	Kshs/Cts
	DOORS	
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	Page No. 22	
	Page No. 23	
646	Female Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	EXTERNAL WALL FINISHES				
	FLOOR, WALL AND CEILING FINISHES				
	INSITU FINISHINGS				
	Plaster; 12 mm first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5); steel trowelled				
	15 mm thick 2 No. coat work; to concrete or blockwork base (m/s); generally to				
A	Walls; external	871	sm		
	Plaster; 15 mm first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5); steel trowelled; with and including Sika 1 or other equal and approved waterproofing compound; to B.S 6920				
	18 mm thick; to concrete or blockwork base (m/s); generally to				
B	Walls; external	282	sm		
	Plaster; 15 mm first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5); steel trowelled				
	18 mm thick; to concrete or blockwork base (m/s); generally to				
C	Sides and soffities of beams; external	8	sm		
D	Walls; external	3,266	sm		
	PAINTING AND DECORATING				
	Prepare and apply two undercoats ;two finishing coats Permacote Ultraguard with Silicone Paint;supplied by Messrs Crown Paints Kenya Ltd,Or other equal and approved ; applied in strict accordance with manufacturer's printed instruction;all to architect's approval				
	Wood floated rendered surfaces				
	Walls				
E	Over 300 mm girth; external	871	sm		
	Steel trowelled plastered surfaces				
	Walls				
F	Over 300 mm girth; external	3,548	sm		
	Sides and soffites of beams				
G	Over 300 mm girth; external	8	sm		

Ref.	Description	Kshs/Cts
	EXTERNAL WALL FINISHES Page No. 25	
646	Female Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	INTERNAL WALL FINISHES				
	FLOOR, WALL AND CEILING FINISHES				
	INSITU FINISHINGS				
	Plaster; 15 mm first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5); steel trowelled				
	18 mm thick; to concrete or blockwork base (m/s); generally to				
A	Sides of beams; internal	223	sm		
B	Walls; internal	16,105	sm		
	TILE, SLAB OR BLOCK FINISHINGS				
	Ceramic tiles; as manufactured by Messrs. Saj Ceramics or other equal and approved; glazed wall tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement; with and including any necessary plastic edge or corner strips and accessories				
	600 x 300 x 6 mm; butt joints straight both ways; to cement and sand base (m/s); generally to				
C	Walls; internal	4,913	sm		
	BEDS OR BACKINGS				
	Render; cement and sand (1:4)				
	15 mm thick one coat backings with and including Sika 1 or other equal and approved waterproofing compound; to B.S 6920; to receive ceramic tiles (m/s); to concrete or blockwork base; generally to				
D	Walls; internal	4,913	sm		
	PAINTING AND DECORATING				
	PREPARE AND APPLY TWO UNDERCOATS; TWO COATS SILK VINYL EMULSION PAINT; TO CROWN 'SOLO' PAINTS OR EQUAL AND APPROVED				
	Steel trowelled plastered surfaces				
	Walls				
E	Over 300 mm girth; internal	16,105	sm		
	Sides and soffites of beams				
F	Over 300 mm girth; internal	223	sm		

Ref.	Description	Kshs/Cts
	INTERNAL WALL FINISHES Page No. 27	
646	Female Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	FLOOR FINISHES				
	FLOOR, WALL AND CEILING FINISHES				
	TILE, SLAB OR BLOCK FINISHINGS				
	Ceramic tiles; as manufactured by Messrs. Saj Ceramics or other equal and approved; non-slip glazed floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement				
	600 x 300 x 8 mm; butt joints straight both ways; to cement and sand base (m/s); generally to				
A	Floors; level; internal	6,116	sm		
B	Skirtings; 100 x 8 mm thick; internal	4,901	lm		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	42 mm thick one coat beds; wood floated; to receive ceramic tiles (m/s); to existing concrete or blockwork base; generally to				
C	Floors; level; internal	5,172	sm		
	42 mm thick one coat beds; with and including Sika 1 or other equal and approved waterproofing compound to B.S 6920; wood floated; to receive ceramic tiles (m/s); to existing concrete or blockwork base; generally to				
D	Floors; level; internal	945	sm		

Ref.	Description	Kshs/Cts
	FLOOR FINISHES Page No. 29	
646	Female Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	CEILING FINISHES				
	FLOOR, WALL AND CEILING FINISHES				
	INSITU FINISHINGS				
	Plaster; 12 mm first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5); steel trowelled				
	15 mm thick 2 No. coat work; to concrete or blockwork base (m/s); generally to				
A	Ceilings; internal	6,060	sm		
	PAINTING AND DECORATING				
	PREPARE AND APPLY TWO UNDERCOATS; TWO COATS VINYL MATT EMULSION PAINT; TO CROWN 'SOLO' PAINTS OR EQUAL AND APPROVED				
	Steel trowelled plastered surfaces				
	Ceilings				
B	Over 300 mm girth; internal	6,060	sm		

Ref.	Description	Kshs/Cts
	CEILING FINISHES Page No. 31	
646	Female Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	STAIRCASE FINISHES				
	METAL WORK				
	PURPOSE MADE UNITS				
	Balustrading				
	Mild steel grab rail				
A	50 mm diameter x 3 mm circular hollow section handrail; fixed to tops or sides of wall with and including 20 x 20 x 3 mm rectangular hollow section tubes 300mm long at 450mm centres, one end fish-tailed and grouted in wall or concrete, the other end welded to handrail	264	lm		
	Mild steel balustrading				
B	1100 mm high horizontal or raking balustrading; comprising 60mm diameter x 3mm circular hollow section handrail including and welded to ends of 1000mm long 50 x50 x 3mm rectangular hollow section balusters at 2000mm centres, one end fish-tailed and grouted in concrete and the other welded to handrail; with and including 20 x 20 x 3mm rectangular hollow section patterned horizontal, vertical and raking infill members welded to balusters and to each other at 200mm (average) centres; all balusters welded to 75 x 50 x 4mm RHS top and bottom horizontal rails	295	lm		
	FLOOR, WALL AND CEILING FINISHES				
	INSITU FINISHINGS				
	Terrazzo; approved colour; cement and local marble chippings (1:2); machine polished				
	25 mm thick, 1 No. coat work to concrete, blockwork or brickwork base (m/s); generally to				
C	Quarter-space or half-space landing; internal	29	sm		
D	Extra; Plastic dividing strips; 50 x 6 mm; including setting to approved patterns in wet cement and sand mortar (m/s)	174	lm		
E	Extra; Aluminium dividing strips; 50 x 6 mm; including setting to approved patterns in wet cement and sand mortar (m/s)	174	lm		
F	Treads; 300 mm wide; one rounded nosing; internal	240	lm		
G	Extra; Non-slip inserts; carborundum; 50 x 10 mm	240	lm		
H	Risers; 150 mm high; one coved junction with floor; internal	240	lm		
J	Skirting; 100 mm wide; rounded junction with wall finish and coved junction with floor; internal	90	lm		
	Plaster; 15 mm first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5); wood floated hard and smooth to finish				
	18 mm thick; to concrete or blockwork base (m/s); generally to				
K	Sloping soffites of stairs and landings; internal	182	sm		
L	Edges of staircase strings; over 300 mm wide; internal	45	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	TILE, SLAB OR BLOCK FINISHINGS				
	Ceramic tiles; as manufactured by Messrs. Saj Ceramics or other equal and approved; non-slip glazed floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement				
	600 x 300 x 8 mm; butt joints straight both ways; to cement and sand base (m/s); generally to				
A	Quarter-space or half-space, landings; internal	23	sm		
B	Treads; 300 mm wide; internal	150	lm		
C	Risers; 150 mm high; internal	150	lm		
D	Skirtings; 100 x 8 mm thick; internal	45	lm		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:3)				
	25 mm thick one coat beds; wood floated; to receive Terrazzo (m/s); to concrete or blockwork base; generally to				
E	Quarter-space or half-space landings; internal	29	sm		
F	Treads; 300 mm wide; internal	240	lm		
G	Risers; 150 mm high; internal	240	lm		
	Screed; cement and sand (1:4)				
	25 mm thick one coat beds; wood floated; to receive Ceramic Tiles (m/s); to concrete or blockwork base; generally to				
H	Quarter-space or half-space landings; internal	23	sm		
J	Treads; 300 mm wide; internal	150	lm		
K	Risers; 150 mm high; internal	150	lm		
	PAINTING AND DECORATING				
	PREPARE AND APPLY TWO UNDERCOATS; THREE COATS VINYL MATT EMULSION PAINT; TO CROWN 'SOLO' PAINTS OR EQUAL AND APPROVED				
	Steel trowelled plastered surfaces				
	Staircase soffites				
L	Over 300 mm girth; internal	132	sm		
	Staircase strings				
M	Over 300 mm girth; internal	73	sm		
	Prepare and apply one coat calcium plumbate primer;two undercoats;two coats oil gloss paint full gloss finish:supplied by Messrs Crown Paint Kenya Ltd .Or other equal and approved;applied in strict accordance with the manufacturer's printed instructions ;all to the architect's approval				
	Metal surfaces				
	Balustrading				
N	Over 300 mm girth; measured flat overall; internal	649	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	Mild steel Grab rail				
A	200 to 300 mm girth; internal	264	lm		

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Ref.	Description	Kshs/Cts
	STAIRCASE FINISHES	
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	Page No. 34	
	Page No. 35	
646	Female Hostel Block	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	JOINERY FITTINGS				
	JOINERY				
	GENERAL JOINERY				
	Wrot Mahogany; prime grade; selected				
	Expansion joint cover				
A	100 x 25 mm thick	44	lm		
	JOINERY FITTINGS				
	THE FOLLOWING IN UTILITY COUNTERTOPS (PROVISIONAL)				
	Concrete work				
	Vibrated reinforced concrete; 1:2:4 - 20 mm aggregate				
B	75 mm thick; suspended worktop	26	sm		
	Mesh fabric reinforcement; B.S. 4483				
C	BRC Reference A 142; mesh weight 2.2 kgs per square metre (measured net - no allowance made for 150 mm laps); including bends, tying wire, distance blocks and the like; to suspended worktop or shelf	26	sm		
	Sawn formwork				
D	Edges of suspended worktop; not exceeding 75 mm high	44	lm		
E	Soffites of suspended worktop	26	sm		
F	Extra over; temporary boxing to form 600 x 450 mm wide opening	38	No		
	Beds and backings				
	Cement and sand backing; wood floated hard and smooth to receive terrazzo worktop;				
G	25 mm thick to worktop	26	sm		
H	100 mm high x 25 mm thick to worktop	44	lm		
	Tiled or block finishes				
	Terrazzo; approved colour; cement and local marble chips (1:2); washed; in 1 coat to and including cement and sand base; generally to				
J	2.5 mm thick; to counter top	26	sm		
K	100 x 25 mm thick; to edges of worktops; with and including rounded edge	44	lm		
	PAINTING AND DECORATING				
	PREPARE AND APPLY ONE COAT APPROVED STAIN; THREE COATS 2-PACK MATT POLYURETHANE VARNISH; TO CROWN 'SOLO' PAINTS OR EQUAL AND APPROVED				
	Timber surfaces				
	Expansion joint cover				
L	100 to 200 mm girth; internal	44	lm		

Ref.	Description	Kshs/Cts
	JOINERY FITTINGS Page No. 37	
646	Female Hostel Block	

Ref.	Description	Kshs/Cts
	Summary	
	SUBSTRUCTURES (ALL PROVISIONAL)	
	REINFORCED CONCRETE FRAME	
	EXTERNAL AND INTERNAL WALLS	
	ROOF CONSTRUCTION, COVERING AND RAINWATER DISPOSAL	
	WINDOWS	
	DOORS	
	EXTERNAL WALL FINISHES	
	INTERNAL WALL FINISHES	
	FLOOR FINISHES	
	CEILING FINISHES	
	STAIRCASE FINISHES	
	JOINERY FITTINGS	
646	Female Hostel Block	

BILL No. 4

EXTERNAL WORKS

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	PAVED AREAS				
	ROADWORKS				
	EARTHWORKS				
	Excavating				
	Bulk or the like; starting from ground level				
A	Not exceeding 1.50 m deep; with and including any necessary grading to falls, crossfalls and cambers, rolling and compacting bottoms of excavations	295	cm		
	Disposal				
	Surplus excavated material				
B	Removing from site	295	cm		
	FILLING				
	Hardcore				
	Filling in making up levels well rolled and compacted to 100% maximum dry density				
C	300 mm thick; handpacked; compacted to falls, cross-falls and cambers	738	sm		
	Stone or quarry dust				
	Blinding surfaces of fill				
D	50 mm thick; compacting; grading to falls, crossfalls and chambers	738	sm		
	ROAD FINISHINGS				
	Precast concrete; Normal; class 20/(20 mm); vibrated; surface fair finish				
	Channel; B.S. 340; bedding, jointing and pointing in cement:sand mortar (1:3); including all necessary excavation, disposal and formwork				
E	125 x 100 mm laid on and including 100 mm thick plain insitu concrete class (1:3:6/20mm aggregate) haunched base and back 150 mm wide	233	lm		
	PAVEMENTS				
	Precast concrete; Normal; class 20/(20 mm); vibrated; part surface fair finish				
	Washed aggregate paving slabs on compacted sand bed (m/s); bedded, jointed and pointed in cement and sand (1:4) mortar;				
F	50 mm thick paving slabs; size 600 x 600 mm	738	sm		

Ref.	Description	Kshs/Cts
	PAVED AREAS	
	Page No. 1	
646	External Works	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	STORMWATER DRAINAGE				
	DRAINAGE				
	THE FOLLOWING IN PLAIN CONCRETE OPEN DRAINS				
	Excavating				
	To from drain; starting from ground level				
A	Not exceeding 1.50 m deep	24	cm		
B	Trimming to slope not exceeding 15 degrees	82	sm		
	Disposal				
	Surplus excavated material				
C	Removing from site	24	cm		
	Precast concrete; normal; class 20/(20 mm); vibrated				
	Half round invert block drain; size 300 mm diameter x 250 mm high; jointed and bedded in cement/sand (1:3) mortar and laid on and including 100 mm thick compacted murram base and sides including all excavations				
D	150 mm internal radius; with and including 600 x 225 x 75 mm thick 2 No. side slabs on each side	178	lm		
	SUNDRIES				
	Labour and material				
	Allow for testing the whole of stormwater drainage installations to the satisfaction of				
E	The Architect and the relevant authorities		Item		
	Connecting to new works to existing storm water drainage; altering and adapting existing manholes, pipework, etc. as necessary; making good all disturbed work to the satisfaction of the Architect and Local Authorities; paying all necessary fees and charges				
F	For all necessary connections		Item		

Ref.	Description	Kshs/Cts
	STORMWATER DRAINAGE Page No. 3	
646	External Works	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	FOUL DRAINAGE				
	DRAINAGE				
	EXCAVATING TRENCHES TO RECEIVE PIPES				
	150 mm internal diameter				
	Starting from ground level; not exceeding 1.50 m depth				
A	450 mm wide x 750 mm average depth part return fill and ram and cart away surplus excavated material	565	lm		
	INSITU CONCRETE; PLAIN				
	Normal mass concrete (1:3:6 - 20mm)				
	Beds and surround				
B	150 mm thick and 450 mm wide under 150 mm diameter pipe; surrounding pipe with similar concrete 150 mm thick; including all necessary formwork	565	lm		
	PIPEWORK				
	Unplasticised P.V.C. drain pipes to B.S. 5481; Class 'C'				
	Pipes; laid and jointed in trench in running length				
C	150 mm diameter	565	lm		
	THE FOLLOWING IN MANHOLES				
	Excavating				
	To form manhole; starting from ground level				
D	Not exceeding 1.50 m deep	26	cm		
	Disposal				
	Surplus excavated material				
E	Removing from site	14	cm		
	Insitu concrete plain; normal; class 15/(20 mm)				
	Manhole base				
F	150 mm thick	30	sm		
	Benchings				
G	200 mm high to bottom of manhole size 600 x 450 mm internally; finished to (1:6) falls; forming half round main and branch channels to any section or curve; finished with 12 mm thick waterproofed cement and sand (1:3) plaster steel trowelled hard and smooth to finish	24	No		
	Insitu concrete reinforced; normal; class 20/(20 mm) ; vibrated				
	Suspended cover slabs				
H	100 mm thick	16	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	Formwork to insitu concrete; formwork generally				
	Soffites; horizontal				
A	Suspended cover slabs; including striking and removing through constrained space and opening	6	sm		
B	Extra; temporary boxing to form opening size 600 x 450 mm; including forming 50 x 50 mm rebate in concrete	24	No		
	Edges of beds or the like				
C	75 to 150 mm high	108	lm		
	Edges of suspended cover slabs				
D	75 to 150 mm high	79	lm		
	Reinforcement; bars; high yield square twisted steel; cold worked; B.S. 4461; including bends, hooks, tying wire, distance blocks, spacers and the like				
	In any location				
E	8 mm diameter	129	kg		
	Approved local stone; machine dressed both sides; bedding, jointing and pointing in cement/sand mortar (1:3)				
	Walls				
F	150 mm thick;	32	sm		
G	Make or leave hole; build in 150 mm diameter pipe and make good	48	No		
	Coated cast iron double seal; pressure air-tight gasket bolted; access covers and frames; B. S. 497				
	Bedding frames in cement mortar (1:4); haunching in plain concrete (1:3:6) where necessary; bedding covers in grease and sand				
H	600 x 450 mm; Medium duty	24	No		
	Step irons; B.S. 1247; galvanised				
	Building into joints				
J	10 mm thick 550 mm long; twice bent; splayed ends	51	No		
	Render; cement and sand (1:4); steel trowelled;				
	15 mm thick 2 No. coat work; to concrete or blockwork base; generally to				
K	Top of suspended cover slab; level	16	sm		
L	Edges of suspended cover slab 150 mm high	79	lm		
	Plaster; cement and sand (1:3); with 5% 'Pudlo' or other equal and approved waterproofing compound; steel trowelled hard and smooth to finish				
	15 mm thick 2 No. coat work; to concrete or blockwork base; generally to				
M	Walls	25	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	SUNDRIES				
	Labour and material				
	Allow for testing the whole of foul sewer drainage installations to the satisfaction of				
A	The Architect and the relevant authorities		Item		
	Connecting to new works to existing foul drainage; altering and adapting existing manholes, pipework, etc. as necessary; making good all disturbed work to the satisfaction of the Architect and Local Authorities; paying all necessary fees and charges				
B	For all necessary connections		Item		

Ref.	Description	Kshs/Cts
	FOUL DRAINAGE	
	Page No. 5	
	Page No. 6	
	Page No. 7	
646	External Works	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	BADMINTON COURT				
	EXCAVATION AND EARTHWORK				
	EXCAVATION				
	Excavating				
	Bulk excavation to remove black cotton soil				
A	Over 300 mm deep; not exceeding 1.50 m deep	65	cm		
	Disposal				
	Surplus excavated material				
B	Removing from site	65	cm		
	FILLING				
	Hardcore				
	Filling in making up levels well rolled and compacted to 100% maximum dry density				
C	Over 300mm thick; handpacked; in layers maximum 150 mm thick	49	cm		
	Stone or quarry dust				
	Blinding surfaces of fill				
D	50 mm thick; compacted to approval to receive damp proofing membrane (m/s)	82	sm		
	DAMP PROOFING MEMBRANES				
	1000 Gauge 'diothene' or other equal and approved polythene sheeting damp proofing membrane; with welted laps (measured net - no allowance made for laps)				
	Horizontal; in 1 No. layer(s)				
E	Over 300mm wide; laid on compacted murram or quarry dust blinding (measured separately)	82	sm		
	CONCRETE WORK				
	INSITU CONCRETE: REINFORCED				
	Normal: class 25/(20mm): vibrated				
	Beds laid in bays not exceeding 35 square metres; including formwork between bays				
F	100 mm thick	82	sm		
	REINFORCEMENT				
	Fabric				
	Steel wire fabric mesh reinforcement to B.S. 4483 Ref: A 142 and K.S. 02-18:1976; weighing 2.22 kg per square metre; in concrete bed (measured net - no allowance made for minimum 300mm laps); including tying and supporting as required				
G	In any location	82	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Edges of beds, roads, footpaths, pavings and the like				
A	75 to 150 mm wide	39	lm		
	ROADWORKS				
	ROAD FINISHINGS				
	MC 30 bitumen prime coat at the nominal spray rate of 1.0 litre per square metre				
	To prepared subbase (m/s)				
B	Courts; to falls, crossfalls or sloping not exceeding 15 degrees from horizontal	82	sm		
	Asphalt Concrete				
	Provide, place and compact Asphalt Concrete Type II (0- 14mm grading) as wearing course on the prepared base course with a nominal binder content 5% as per the specifications or as directed by the Engineer				
C	50mm thick; to Approval of the Engineer	82	sm		
	PRIME COST AND PROVISIONAL SUMS				
	PROVISIONAL SUMS				
	The following Provisional Sums are to be measured on completion and priced in accordance with the rates contained in these Bills of Quantities or pro-rata thereto or deducted in whole if not required				
	Provisional sum for				
D	Basketball court marking; One Hundred Thousand Kenya Shillings		Item		

Ref.	Description	Kshs/Cts
	BADMINTON COURT Page No. 9 Page No. 10	
646	External Works	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	VOLLEYBALL COURT				
	EXCAVATION AND EARTHWORK				
	EXCAVATION				
	Excavating				
	Bulk excavation to remove black cotton soil				
A	Over 300 mm deep; not exceeding 1.50 m deep	130	cm		
	Disposal				
	Surplus excavated material				
B	Removing from site	130	cm		
	FILLING				
	Hardcore				
	Filling in making up levels well rolled and compacted to 100% maximum dry density				
C	Over 300mm thick; handpacked; in layers maximum 150 mm thick	98	cm		
	Stone or quarry dust				
	Blinding surfaces of fill				
D	50 mm thick; compacted to approval to receive damp proofing membrane (m/s)	163	sm		
	DAMP PROOFING MEMBRANES				
	1000 Gauge 'diothene' or other equal and approved polythene sheeting damp proofing membrane; with welted laps (measured net - no allowance made for laps)				
	Horizontal; in 1 No. layer(s)				
E	Over 300mm wide; laid on compacted murram or quarry dust blinding (measured separately)	163	sm		
	CONCRETE WORK				
	INSITU CONCRETE: REINFORCED				
	Normal: class 25/(20mm): vibrated				
	Beds laid in bays not exceeding 35 square metres; including formwork between bays				
F	100 mm thick	163	sm		
	REINFORCEMENT				
	Fabric				
	Steel wire fabric mesh reinforcement to B.S. 4483 Ref: A 142 and K.S. 02-18:1976; weighing 2.22 kg per square metre; in concrete bed (measured net - no allowance made for minimum 300mm laps); including tying and supporting as required				
G	In any location	163	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Edges of beds, roads, footpaths, pavings and the like				
A	75 to 150 mm wide	54	lm		
	ROADWORKS				
	ROAD FINISHINGS				
	MC 30 bitumen prime coat at the nominal spray rate of 1.0 litre per square metre				
	To prepared subbase (m/s)				
B	Courts; to falls, crossfalls or sloping not exceeding 15 degrees from horizontal	163	sm		
	Asphalt Concrete				
	Provide, place and compact Asphalt Concrete Type II (0- 14mm grading) as wearing course on the prepared base course with a nominal binder content 5% as per the specifications or as directed by the Engineer				
C	50mm thick; to Approval of the Engineer	163	sm		
	PRIME COST AND PROVISIONAL SUMS				
	PROVISIONAL SUMS				
	The following Provisional Sums are to be measured on completion and priced in accordance with the rates contained in these Bills of Quantities or pro-rata thereto or deducted in whole if not required				
	Provisional sum for				
D	Installation and erection of volley ball court hoops and stands ; Two Hundred Thousand Kenya Shillings		Item		
E	Volleyball court marking; One Hundred Thousand Kenya Shillings		Item		

Ref.	Description	Kshs/Cts
	VOLLEYBALL COURT	
	Page No. 12	
	Page No. 13	
646	External Works	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	BASKETBALL COURT				
	EXCAVATION AND EARTHWORK				
	EXCAVATION				
	Excavating				
	Bulk excavation to remove black cotton soil				
A	Over 300 mm deep; not exceeding 1.50 m deep	351	cm		
	Disposal				
	Surplus excavated material				
B	Removing from site	351	cm		
	FILLING				
	Hardcore				
	Filling in making up levels well rolled and compacted to 100% maximum dry density				
C	Over 300mm thick; handpacked; in layers maximum 150 mm thick	263	cm		
	Stone or quarry dust				
	Blinding surfaces of fill				
D	50 mm thick; compacted to approval to receive damp proofing membrane (m/s)	439	sm		
	DAMP PROOFING MEMBRANES				
	1000 Gauge 'diothene' or other equal and approved polythene sheeting damp proofing membrane; with welted laps (measured net - no allowance made for laps)				
	Horizontal; in 1 No. layer(s)				
E	Over 300mm wide; laid on compacted murram or quarry dust blinding (measured separately)	439	sm		
	CONCRETE WORK				
	INSITU CONCRETE: REINFORCED				
	Normal: class 25/(20mm): vibrated				
	Beds laid in bays not exceeding 35 square metres; including formwork between bays				
F	100 mm thick	439	sm		
	REINFORCEMENT				
	Fabric				
	Steel wire fabric mesh reinforcement to B.S. 4483 Ref: A 142 and K.S. 02-18:1976; weighing 2.22 kg per square metre; in concrete bed (measured net - no allowance made for minimum 300mm laps); including tying and supporting as required				
G	In any location	439	sm		

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Edges of beds, roads, footpaths, pavings and the like				
A	75 to 150 mm wide	88	lm		
	ROADWORKS				
	ROAD FINISHINGS				
	MC 30 bitumen prime coat at the nominal spray rate of 1.0 litre per square metre				
	To prepared subbase (m/s)				
B	Courts; to falls, crossfalls or sloping not exceeding 15 degrees from horizontal	439	sm		
	Asphalt Concrete				
	Provide, place and compact Asphalt Concrete Type II (0- 14mm grading) as wearing course on the prepared base course with a nominal binder content 5% as per the specifications or as directed by the Engineer				
C	50mm thick; to Approval of the Engineer	439	sm		
	PRIME COST AND PROVISIONAL SUMS				
	PROVISIONAL SUMS				
	The following Provisional Sums are to be measured on completion and priced in accordance with the rates contained in these Bills of Quantities or pro-rata thereto or deducted in whole if not required				
	Provisional sum for				
D	Installation and erection of basket ball court hoops and stands ; Two Hundred and Fifty Thousand Kenya Shillings		Item		
E	Basketball court marking; Two Hundred Thousand Kenya Shillings		Item		

Ref.	Description	Kshs/Cts
	BASKETBALL COURT	
	Page No. 15	
	Page No. 16	
646	External Works	

Ref.	Description	Kshs/Cts
	Summary	
	PAVED AREAS	
	STORMWATER DRAINAGE	
	FOUL DRAINAGE	
	BADMINTON COURT	
	VOLLEYBALL COURT	
	BASKETBALL COURT	
646	External Works	

BILL No. 5

PRIME COSTS AND PROVISIONAL SUMS

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	PROVISIONAL SUMS				
	PRIME COST AND PROVISIONAL SUMS				
	PROVISIONAL SUMS				
	The following Provisional Sums are to be measured on completion and priced in accordance with the rates contained in these Bills of Quantities or pro-rata thereto or deducted in whole if not required				
	Provisional sum for				
A	Contingencies; Ten Million Kenya Shillings		Item		
B	Covered walkways; One Million Kenya Shillings		Item		

Ref.	Description	Kshs/Cts
	PROVISIONAL SUMS Page No. 1	
646	Prime costs and Provisional sums	

Ref.	Description	Quantity	Unit	Rate	Kshs/Cts
	PRIME COST SUMS				
	PRIME COST AND PROVISIONAL SUMS				
	PRIME COST SUMS				
	P.C. Sums for works to be executed by Nominated Sub-Contractors				
	Provide P.C. Sums for				
A	Electrical and Mechanical installations; One Hundred and Forty Two Million and Eighteen Thousand Kenya Shillings		Item		
B	Add for profit (%)		Item		
C	Allow for general attendance and all associated builders works		Item		
D	Joinery fittings; Twenty Nine Million Kenya Shillings		Item		
E	Add for profit (%)		Item		
F	Allow for general attendance and all associated builders works		Item		
	P.C Sums for materials to be supplied by Nominated Suppliers				
	Provide P.C Sums for				
G	Loose furniture and furnishings		Item		

Ref.	Description	Kshs/Cts
	PRIME COST SUMS Page No. 3	
646	Prime costs and Provisional sums	

Ref.	Description	Kshs/Cts
	Summary	
	PROVISIONAL SUMS	
	PRIME COST SUMS	
646	Prime costs and Provisional sums	

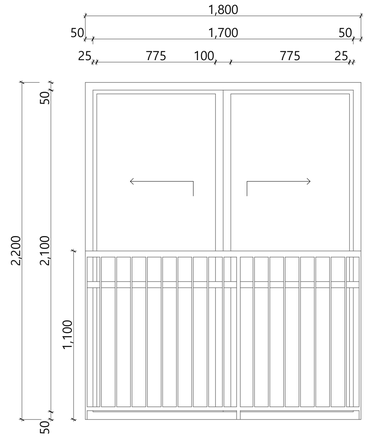
MAIN SUMMARY

			Kshs
PROPOSED STUDENT HOSTELS FOR UMMA UNIVERSITY, KAJIADO.			
	MAIN SUMMARY		
	Bills of Quantities	**Page**	
BILL No. 1	Preliminaries and General Conditions	P19	
BILL No. 2	1 No.Block - Boys' Hostel Block	2/39	
BILL No. 3	1 No.Block - Girls' Hostel Block	3/39	
BILL No. 4	External Works	4/18	
BILL No. 5	Prime Costs and Provisional Sums	5/5	
	TOTAL CONSTRUCTION COST (Inclusive 16% V.A.T)		
	ADD PROFESSIONAL FEES (6% +VAT)		
	TOTAL PROJECT COST (Inclusive 16% V.A.T)		
	MS/1		

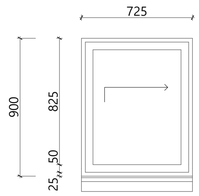
APPPENDIX A

WINDOWS AND DOORS SCHEDULES

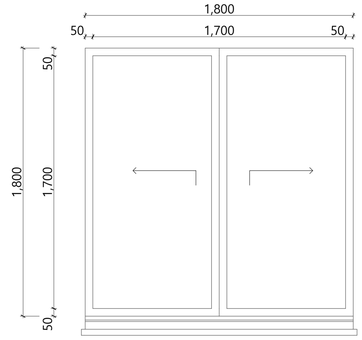
UMMA UNIVERSITY – WINDOW AND DOOR SCHEDULE



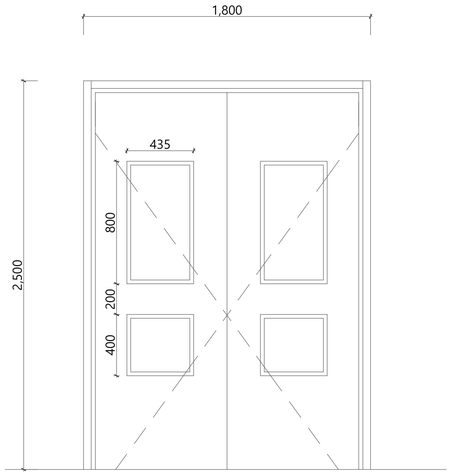
WD 01	DESCRIPTION	
	SIZE	FINISH
Window panel:	3mm thick heavy duty U-channels primed and painted to schedule	As per Typical window
Window frame:	50x50x3mm thick frame primed and painted to schedule	
Window leaf type	Horizontal sliding panels	
Glass type:	6mm thick clear laminated glass	
NOTE:		
	HARDWARE	
Handle type:	Finish : Matte black handle lock window fasterners	Quantity : 2
Window stay type	–	Quantity : 2
Location:	4-bed rooms, Locker rooms, Games Room, PWD room	
	Overall Quantity:172	Sill Height: 300mm



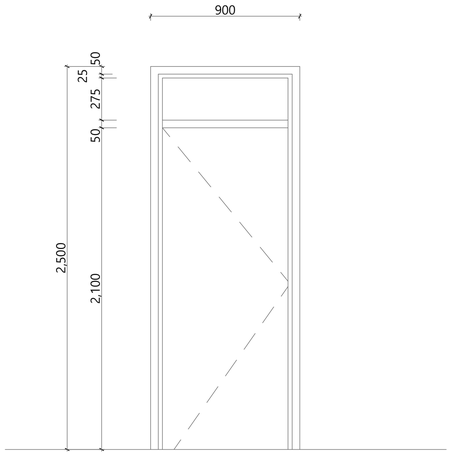
WD 02	DESCRIPTION	
	SIZE	FINISH
Window panel:	3mm thick heavy duty U-channels primed and painted to schedule	As per Typical window
Window frame:	50x50x3mm thick frame primed and painted to schedule	
Window leaf type	Horizontal sliding panels	
Glass type:	4mm thick clear laminated glass	
NOTE:		
	HARDWARE	
Handle type:	Finish : Matte black handle lock window fasterners	Quantity : 2
Window stay type	–	Quantity : 2
Location:	All Washrooms	
	Overall Quantity:184	Sill Height: 1200mm



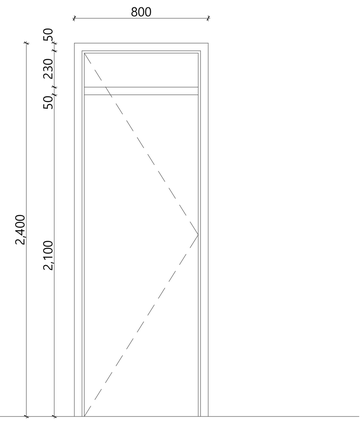
WD 03	DESCRIPTION	
	SIZE	FINISH
Window panel:	3mm thick heavy duty U-channels primed and painted to schedule	As per Typical window
Window frame:	50x50x3mm thick frame primed and painted to schedule	
Window leaf type	Horizontal sliding panels	
Glass type:	4mm thick clear laminated glass	
NOTE:		
	HARDWARE	
Handle type:	Finish : Matte black handle lock window fasterners	Quantity : 2
Window stay type	–	Quantity : 2
Location:	Laundry area	
	Overall Quantity: 4	Sill Height: 1100mm



D – 01	DESCRIPTION	
Door panel	Double leaf, single swing fire door	
Door frame	To manufacturer's specs	
Glass type	6mm thick wire vision glass	
Accessories	3. No. heavy duty hinges to manufacturer's specs 1. No. panic bar to manufacurer's specs 1. No. stainless steel mortice door lock	
Location	Fire Escape stair	
Overall Quantity	10	



D – 02	DESCRIPTION	
Door panel	Single leaf, single swing semi-solid flush mahogany door	
Door frame	150mm x 50mm thick mahogany frame with 75mm x 25mm thick architraves all round on both sides	
Glass type	4mm thick clear transorm glass	
Accessories	3. No. heavy duty brass butt hinges 1. No. 3-lever mortise lock with tubular door handles 1. No. rubber door stopper in stainless steel mounting	
Location	PWD rooms, 4-bed rooms, Custodian's office, Prayer room	
Overall Quantity	160	



D – 03	DESCRIPTION	
Door panel	Single leaf, single swing semi-solid flush mahogany door	
Door frame	150mm x 50mm thick mahogany frame with 75mm x25mm thick architraves all round on both sides	
Glass type	–	
Accessories	3. No. heavy duty brass butt hinges 1. No. 3-lever mortise lock with tubular door handles 1. No. rubber door stopper in stainless steel mounting	
Location	Wet area entrances, bathrooms	
Overall Quantity	308	

NOTES:

ALL DIMENSIONS ARE IN MILIMETERS UNLESS OTHERWISE STATED.

DIMENSIONS TO BE **READ** & NOT TO BE SCALED FROM THIS DRAWING

CONTRACTORS TO CONFIRM ALL DIMENSIONS ON SITE BEFORE CONSTRUCTION COMMENCES AND ANY DISCREPANCY TO BE REPORTED TO THE PROJECT ARCHITECT

REVISION	DATE:	NO

CEILING FINISH — C F — FLOOR FINISH

WALL FINISH — R S — SKIRTING FINISH

PLEASE REFER TO THE CORRECT FINISHES SCHEDULE PROVIDED ON AS SEPARATE LAYOUT

Umma Univeristy
Kajiado

USER
CLIENT:.....

SIGNED:..... DATE:...../...../.....

PROJECT
CO-ORDINATOR:.....

SIGNED:..... DATE:...../...../.....

WORKING DRAWINGS

CONSULTANTS:

ARCHITECT
TECTURA INTERNATIONAL
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info@norkun.com www.norkun.com

PROJECT TITLE

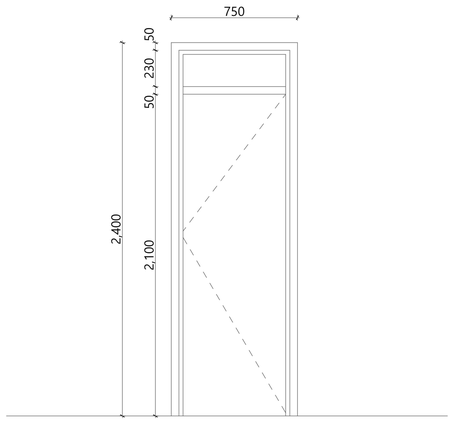
Proposed Hostels for Umma University in Kajiado

DRAWING TITLE	REF
	APPROVAL DRAWINGS

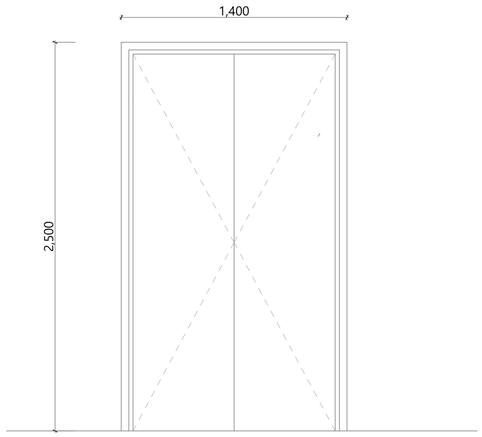
SCALE:	DRAWN :	CHECKED :	DATE:
N.T.S	C.M.N	N.M	4TH MARCH 2025

APPOINTMENT NUMBER

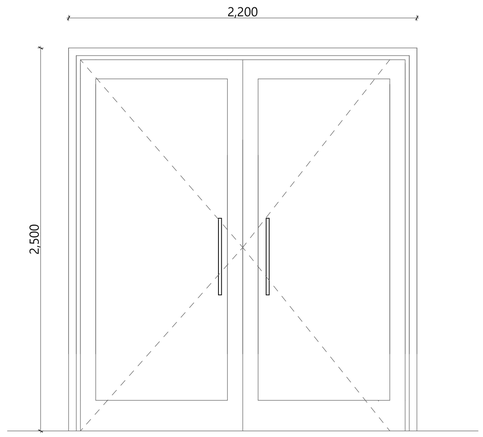
PROJECT NUMBER	DRAWING NUMBER	REVISION
TI - UUH/25/11		02



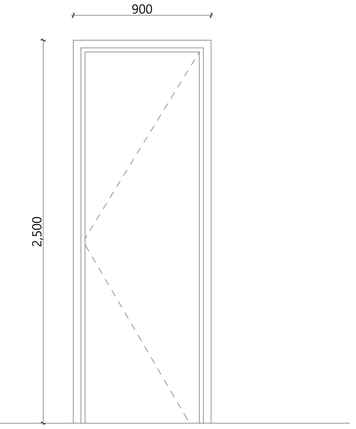
D – 04	DESCRIPTION
Door panel	Single leaf, single swing semi-solid flush mahogany door
Door frame	150mm x 50mm thick mahogany frame with 75mm x 25mm thick architraves all round on both sides
Glass type	–
Accessories	3. No. heavy duty brass butt hinges 1. No. 3-lever mortise lock with tubular door handles 1. No. rubber door stopper in stainless steel mounting
Location	Toilets
Overall Quantity	308



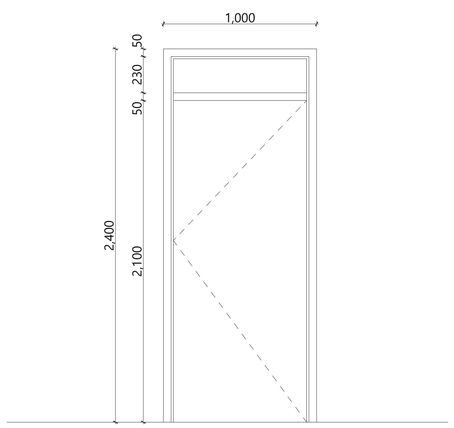
D – 05	DESCRIPTION
Door panel	Double leaf, single swing mild steel door
Door frame	Mild steel frame
Glass type	–
Accessories	3. No. heavy duty brass butt hinges 2. No. 3-lever mortise lock with tubular door handles 2. No. rubber door stopper in stainless steel mounting
Location	Ground floor locker room
Overall Quantity	1



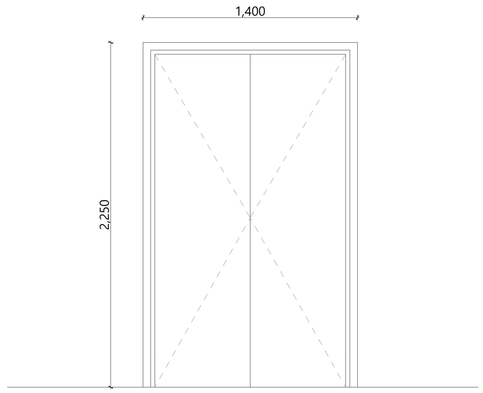
D – 06	DESCRIPTION
Door panel	Double leaf, double Mild steel door
Door frame	Mild steel frame
Glass type	–
Accessories	3. No. heavy duty butt hinges 2. No. 3-lever mortise lock with long tubular door handles 2. No. double swing door closers
Location	Main entrance
Overall Quantity	1



D – 07	DESCRIPTION
Door panel	Single leaf, single swing semi-solid flush mahogany door
Door frame	150mm x 50mm thick mahogany frame with 75mm x 25mm thick architraves all round on both sides
Glass type	–
Accessories	3. No. heavy duty brass butt hinges 1. No. 3-lever mortice dead lock with tubular door handles 1. No. rubber door stopper in stainless steel mounting
Location	Duct doors
Overall Quantity	12



D – 08	DESCRIPTION
Door panel	Single leaf, single swing semi-solid flush mahogany door
Door frame	150mm x 50mm thick mahogany frame with 75mm x25mm thick architraves all round on both sides
Glass type	–
Accessories	3. No. heavy duty brass butt hinges 1. No. 3-lever mortise lock with tubular door handles 1. No. rubber door stopper in stainless steel mounting
Location	PWD Wet area entrances, PWD Toilets
Overall Quantity	6



D – 09	DESCRIPTION
Door panel	Double leaf, single swing mild steel door
Door frame	Mild steel frame
Glass type	–
Accessories	3. No. heavy duty brass butt hinges 2. No. 3-lever mortise lock with tubular door handles 2. No. rubber door stopper in stainless steel mounting
Location	First floor locker room
Overall Quantity	1

NOTES:

ALL DIMENSIONS ARE IN MILIMETERS UNLESS OTHERWISE STATED.

DIMENSIONS TO BE **READ** & NOT TO BE SCALED FROM THIS DRAWING

CONTRACTORS TO CONFIRM ALL DIMENSIONS ON SITE BEFORE CONSTRUCTION COMMENCES AND ANY DISCREPANCY TO BE REPORTED TO THE PROJECT ARCHITECT

REVISION	DATE:	NO

CEILING FINISH — C
FLOOR FINISH — F
WALL FINISH — R
SKIRTING FINISH — S

PLEASE REFER TO THE CORRECT FINISHES SCHEDULE PROVIDED ON AS SEPARATE LAYOUT

Umma Univeristy
Kajiado

USER
CLIENT:.....

SIGNED:..... DATE:...../...../.....

PROJECT
CO-ORDINATOR:.....

SIGNED:..... DATE:...../...../.....

WORKING DRAWINGS

CONSULTANTS:

ARCHITECT

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Planners, Architects and Interior designers
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PROJECT TITLE

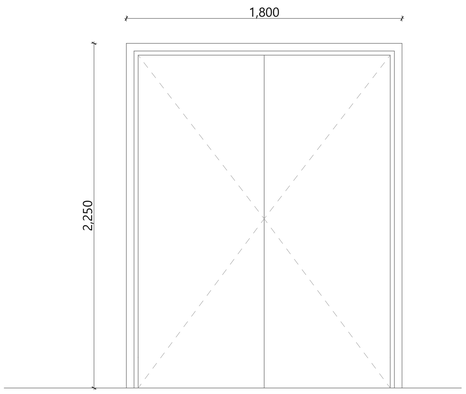
Proposed Hostels for Umma University in Kajiado

DRAWING TITLE	REF
	APPROVAL DRAWINGS

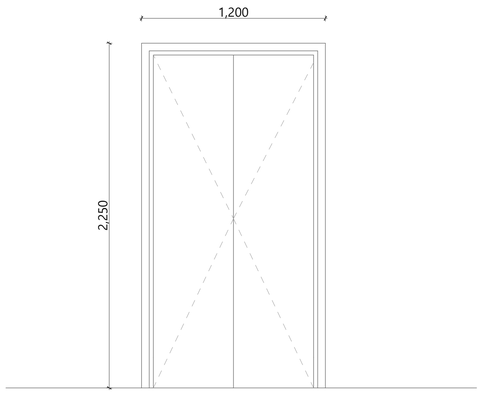
SCALE:	DRAWN :	CHECKED :	DATE:
N.T.S	C.M.N	N.M	4TH MARCH 2025

APPOINTMENT NUMBER

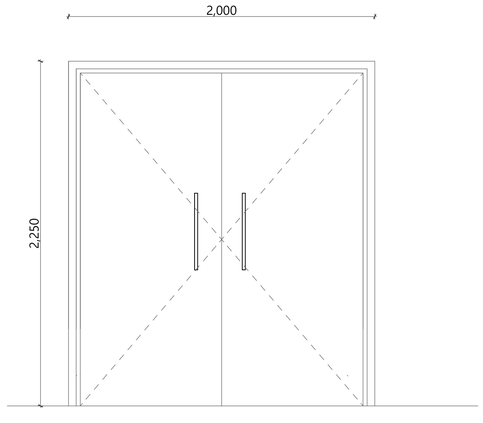
PROJECT NUMBER	DRAWING NUMBER	REVISION
TI - UUH/25/11		02



D – 10	DESCRIPTION
Door panel	Double leaf, single swing mild steel door
Door frame	Mild steel frame
Glass type	–
Accessories	3. No. heavy duty brass butt hinges 2. No. 3-lever mortise lock with tubular door handles 2. No. rubber door stopper in stainless steel mounting
Location	2nd – 4th floors locker rooms
Overall Quantity	3



D – 11	DESCRIPTION
Door panel	Double leaf, single swing mild steel door
Door frame	Mild steel frame
Glass type	–
Accessories	3. No. heavy duty brass butt hinges 2. No. 3-lever mortise lock with tubular door handles 2. No. rubber door stopper in stainless steel mounting
Location	Laundromart
Overall Quantity	1



D – 12	DESCRIPTION
Door panel	Double leaf, double Mild steel door
Door frame	Mild steel frame
Glass type	–
Accessories	3. No. heavy duty butt hinges 2. No. 3-lever mortise lock with long tubular door handles 2. No. double swing door closers
Location	Roof terrace
Overall Quantity	2

NOTES:

ALL DIMENSIONS ARE IN MILIMETERS UNLESS OTHERWISE STATED.

DIMENSIONS TO BE **READ** & NOT TO BE SCALED FROM THIS DRAWING

CONTRACTORS TO CONFIRM ALL DIMENSIONS ON SITE BEFORE CONSTRUCTION COMMENCES AND ANY DISCREPANCY TO BE REPORTED TO THE PROJECT ARCHITECT

REVISION	DATE:	NO

CEILING FINISH — C F — FLOOR FINISH

WALL FINISH — R S — SKIRTING FINISH

PLEASE REFER TO THE CORRECT FINISHES SCHEDULE PROVIDED ON AS SEPARATE LAYOUT

Umma Univeristy
Kajiado

USER
CLIENT:.....

SIGNED:..... DATE:...../...../.....

PROJECT
CO-ORDINATOR:.....

SIGNED:..... DATE:...../...../.....

WORKING DRAWINGS

CONSULTANTS:

ARCHITECT
TECTURA INTERNATIONAL
Planners, Architects and Interior designers
Tectura Studio 2727 The Crescent - Parklands
P. O. Box 54634 - 00200
Tel. 254(2) 751443-751465-751680-751685
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PROJECT TITLE

Proposed Hostels for Umma University in Kajiado

DRAWING TITLE		REF	
		APPROVAL DRAWINGS	
SCALE: N.T.S	DRAWN : C.M.N	CHECKED : N.M	DATE: 4TH MARCH 2025
APPOINTMENT NUMBER			
PROJECT NUMBER		DRAWING NUMBER	REVISION
TI - UUH/25/11			02

APPENDIX B

ARCHITECTURAL SPECIFICATIONS

ARCHITECTS SPECIFICATION

GENERAL

DISCREPANCIES IN DESCRIPTIONS

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

DISCREPANCIES IN DRAWINGS

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

TESTS AND SAMPLES

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

KENYA STANDARDS

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

EXCAVATION AND EARTHWORKS

SITE CLEARANCE

See Structural Engineers Specification

GRUBBING

See Structural Engineers Specification.

EXCAVATION

See Structural Engineers Specification

WATER IN EXCAVATIONS

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

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

Provision has been made in the Preliminaries and General Conditions of these Bills of Quantities for the Contractor to insert a price against this item.

HARD ROCK

See Structural Engineers Specification

FOUNDATION EXCAVATIONS

See Structural Engineers Specification.

SURPLUS SOIL DISPOSAL

See Structural Engineers Specification.

TOP SOIL FOR SPREADING

See Structural Engineers Specification.

FILLING UNDER SURFACE BED IN BUILDINGS

See Structural Engineers Specification.

FILLING OBTAINED FROM THE EXCAVATIONS

See Structural Engineers Specification.

MATERIALS FOUND IN EXCAVATIONS

See Structural Engineers Specification.

CONCRETE WORK

See Structural Engineers Specification.

WALLING

CEMENT

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

SAND

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

LIME

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

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

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

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

CEMENT MORTAR

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

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

GAUGED LIME MORTAR

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

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

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

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

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

CONCRETE BLOCKS

Concrete blocks shall be hollow or solid as required and shall be hard, true to size and shape with sharp arrises in accordance with B.S. 2028 type 'A'. They are to be obtained from an approved manufacturer and shall be equal

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

LOAD BEARING CONCRETE BLOCKS

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

COLOURED CONCRETE BLOCKS

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

HOLLOW CLAY BLOCKS

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

FAIR FACED CONCRETE BLOCKWORK

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

STONE WALLING

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

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

1) Fine butched stone shall be either chisel dressed or machine dressed - dress the external face of each stone to the finest face practically obtainable and finish to a fine rubbed plane surface.

2) Medium butched chisel dressed stone - chisel dress the external face of each stone so that chisel marks are approximately the same width, with ridges between adjacent marks approximately in the same plane.

3) Quarry faced stone - do not work the external face of each stone.

4) Random rubble stone facing - stones of random shape, colour and size as facing to backing wall.

5) Random squared medium butched chisel dressed stone - stones of random shape, colour, size and thickness squared and dressed as before described.

6) Stone walling of approved colour - walling to be built using grey and mixed blue and grey coloured stones.

7) Stone walling of variegated colours - walling to be built using multi colour stone approved by the Architect and mixed in proportions approved by the Architect.

8) Machine dressed stone facing shall be 25mm or 50mm thick as required by the Architect. Machine rotary blade cut stones facing on backing wall.

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

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

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

BRICK FACINGS

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

WALLING GENERALLY

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

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

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

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

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

All walling 150mm thick and under is to be reinforced with one layer of 25mm x 16 B.W.G. hoop iron built into every second course well lapped at joints and intersections and carried at least 115mm into abutting walls at junctions.

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

DAMP PROOF COURSES

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

OTHER TRADES

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

ROOFING

SCREEDS

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

GUARANTEE

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

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

ALUMINIUM EMBOSSED CAP SHEET ROOF COVERING

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

MASTIC ASPHALT ROOFING

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

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

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

MASTIC ASPHALT TANKING

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

ASBESTOS CEMENT SHEETING

Asbestos cement roof sheeting and accessories shall be as manufactured by Kenya Asbestos Cement Co. Ltd., P.O. Box 90662, Mombasa, and fixed strictly in accordance with their printed instructions and generally in accordance with International Standard 459.

The sheeting will be fixed to steel purlins with galvanised hook bolts and patent P.V.C. combined capping, rubber washer and metal nut.

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

Ridges and other accessories shall be fixed to timber purlins as above described.

Fixed bolts and screws shall comply with B.S. 1494.

Side laps shall be minimum one and a half corrugations and end laps shall be as specified.

GALVANISED CORRUGATED IRON SHEETING

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

ROOFING TILES

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

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

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

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

CARPENTRY, JOINERY AND IRONMONGERY

QUALITY OF TIMBER

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

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

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

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

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

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

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

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

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

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

GENERALLY

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

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

Knotting shall comply with B.S. 1336

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

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

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

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

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

Should any of the Carpenter's or Joiner's work shrink, warp, wind or develop any other defects within six months after the completion of the works, the same shall be removed and new fixed in its place together with all other work which may be affected thereby, all at the Contractor's cost and expense.

INSECT DAMAGE

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

DIMENSIONS

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

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

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

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

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

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

PRESERVATION OF TIMBER

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

SPECIES OF TIMBER

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

SEASONING OF TIMBER

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

PREPARATION AND PROTECTION OF TIMBER

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

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

CLEARING UP

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

TIMBER IN MASONRY, ETC.

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

PRIMING WOODWORK

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

JOINTING

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

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

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

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

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

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

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

JOINERY

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

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

(c) All framed work shall be cut out, properly tenoned, shouldered etc., and framed together as soon after the commencement of the building as is practicable but shall not be wedged up until the building is ready for fixing the same and any portions that warp, wind, develop shakes or other defects shall be replaced with new. As soon as required for fixing in the building the framing shall be glued together and properly wedged or pinned, etc., as directed.

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

TOLERANCE

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

SCRIBING

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

SHRINKAGE

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

VENEERS

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

NATURAL FINISH

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

FLUSH DOORS

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

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

CHIPBOARD

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

BLOCKBOARD

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

PLYWOOD

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

HARDBOARD

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

SOFTBOARD

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

PLASTIC LAMINATE

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

PLUGS

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

PROTECT JOINERY

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

SITE DIMENSIONS

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

BILLS OF QUANTITIES DIMENSIONS

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

IRONMONGERY

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

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

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

GENERALLY

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

METAL WORK

GENERALLY

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

WELDING

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

MILD STEEL

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

GALVANISED STEEL SHEET

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

BOLTS AND SET SCREWS

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

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

ALUMINIUM

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

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

HOOP IRON.

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

PRICING INFORMATION

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

FLOOR, WALL AND CEILING FINISHES

GENERALLY

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

CEMENT

Shall be as described in 'Walling'

LIME

Shall be as described in 'Walling'

SAND

Shall be as described in 'Walling'

WATER

Shall be as described in Structural Engineers Specification.

WORKMANSHIP

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

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

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

BOARD MARKED FINISH

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

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

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

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

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

Protective covering is to be applied as necessary where finished concrete is liable to damage or staining.

CEMENT AND SAND PAVING.

Cement and sand paving shall be composed of one part cement to one part sand to three parts of 6 - 3mm gauge black trap grit, applied in two coats to the thickness shown on the drawings. The Contractor shall allow for finishing surfaces perfectly smooth and hard with a steel trowel and dead level or to true falls if so desired.

SCREEDS AND BACKINGS

Screeds and backings shall be composed of one part of cement to three parts of sand unless otherwise specified in the Bills of Quantities by volume and shall be trowelled hard and smooth to the texture required by the finish to be applied.

WATERPROOFING AGENT

Screeds and pavings described as incorporating waterproofing agent shall have Lillington's No. 1 Metallic Liquid or similar mixed in. Mixing and application shall be strictly in accordance with the manufacturer's instructions.

BONDING LIQUID

The bonding liquid shall be Sealocrete Sealobond high P.V.A. content brushed on. Surfaces to be treated shall be thoroughly cleaned down and be free from all loose material, dust, mould, oil, grease and any other foreign matter. The bonding liquid shall be allowed to dry before screeds and renderings are applied. All mixing and application shall be carried out strictly in accordance with the recommendations of the manufacturers, Sealocrete Products Ltd.

HARDENING AGENT

Screeds and pavings described as incorporating hardening agent shall incorporate Sealocrete Double Strength Premix Plus S.R.A. mixed with the gauging water at the rate of 2.3 litres of Sealocrete to every 50 kgs. of cement. Mixing and application shall be carried out strictly in accordance with the recommendations of the manufacturers, Sealocrete Products Ltd.

TERRAZZO AND GRANOLITHIC WORK

The whole of the terrazzo and granolithic work is to be carried out by a specialist Sub-Contractor who is to be specifically approved by the Architect and the Contractor will be required to make arrangements for the execution of this work and bear all expenses incurred. No change in the rates for this work inserted by the Contractor in these Bills of Quantities will be allowed.

The materials used and methods of construction for terrazzo work are to be in accordance with the B.S. Code of Practice C.P. 204/1951.

The surface finish to terrazzo or granolithic is to be brushed, ground or polished as specified. These textures are to comply with samples approved by the Architect.

The terrazzo topping is to be 20mm thick with imported white cement and 12mm marble aggregate, rolled and trowelled to a dense even surface and rubbed down at completion t a grit finished surface free from holes and blemishes. Colours shall be as selected by the Architect. The paving is to be laid in squares divided by plastic strips anchored securely in the screed and having their top edges truly level with the finished floor surface. The terrazzo work is to be laid and finished complete to the approval of the Architect. The screed between the terrazzo topping and the concrete floor is to be cement and sand (1:3) laid by the Sub-Contractor.

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

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

MARBLE

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

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

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

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

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

or lime putty are required to position the slabs. The back of slabs shall be coated with "shellac" or other equal and approved paint.

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

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

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

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

QUARRY TILES

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

VINYL ASBESTOS FLOOR TILES

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

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

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

PARQUETRY

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

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

Screeds must be perfectly smooth level clean and dry before laying commences and parquetry must be laid strictly in accordance with the manufacturer's instructions.

DIVIDING STRIPS

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

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

NON-SLIP POLISHED PAVINGS

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

LIGHTWEIGHT SCREEDS

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

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

DUST PROOFING COMPOUND

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

PLASTERING AND RENDERING GENERALLY

All surfaces to be plastered or rendered shall be brushed clean and be well wetted before plaster is applied. All plaster and rendering shall be kept continuously damp for seven days after application. All arrises shall be finished true and slightly rounded except where otherwise stated, and shall be run at the same time as the adjoining plaster. No partially or wholly set plaster or rendering will be allowed to be used or re-mixed.

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

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

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

INTERNAL PLASTER

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

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

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

EXTERNAL RENDERING

External rendering shall consist of cement and sand (1:8) applied in one coat and finished with a wood float as specified. Unless otherwise described rendering is to be 12mm thick applied in one coat. Rendering described as 20mm thick or over shall be applied in two coats.

TYROLEAN RENDER

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

JOINTS

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

CRACKS AND DEFECTS

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

BAGGING

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

CERAMIC TILES

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

SAMPLES

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

APPROVED SUB-CONTRACTORS

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

PRICING INFORMATION

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

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

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

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

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

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

PROTECTING FLOOR FINISHINGS

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

GENERALLY

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

GLAZING

GENERALLY

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

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

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

Tempered glass shall be of the thicknesses specified.

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

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

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

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

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

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

PRICING INFORMATION

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

PAINTING AND DECORATING

GENERALLY

The whole of the work shall be executed to the entire satisfaction of the Architect, and all work rejected is to be re-executed by the Contractor at his own expense. Subject to the foregoing, the methods of application adopted i.e. brush, spray, roller, etc. are at the discretion of the Contractor, unless otherwise described.

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

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

MAINTENANCE

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

MATERIALS

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

IRONMONGERY

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

APPROVED SUB-CONTRACTORS

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

MIXING

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

COLOURS

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

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

AREAS TO BE READY FOR PAINTING ETC.

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

PREPARATION

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

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

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

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

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

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

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

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

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

PAINTS

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

a) Robbialac

b) Crown Paints

c) Dulux Paints

d) Sadolins

PLASTIC EMULSION PAINTS

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

BITUMINOUS SOLUTION

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

PRIMERS

Unprimed steelwork shall be primed with a Red Lead Primer.

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

Woodwork shall be primed with a Pink Wood Primer.

UNDERCOATING

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

PRODUCT SPECIFICATION FOR PAINTS

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

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

PRICING INFORMATION

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

APPENDIX C

STRUCTURAL ENGINEER'S SPECIFICATIONS

STRUCTURAL ENGINEERS SPECIFICATION

GENERAL

ARCHITECT OR ENGINEER

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

DISCREPANCIES IN DESCRIPTIONS

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

TESTS AND SAMPLES

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

KENYA STANDARDS

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

EXCAVATION AND EARTHWORK

SITE CLEARANCE

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

GRUBBING

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

1. Stumps and roots of large trees shall be completely removed.

2. Stumps and roots of small trees, bushes or other vegetation shall be completely removed to a depth of at least 600mm below formation.

3 Smaller stumps and roots of vegetation up to 25mm thick shall be completely removed to a depth of 230mm below formation.

4. Fine roots shall be removed to as great depth as is practicable by hand.

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

EXCAVATION

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

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

HARD ROCK

Any rock or other hard materials encountered in excavating to the required depths which in the opinion of the Architect or Engineer can only be removed by wedges, compressed air or other special plant, or explosives shall be paid for as an extra and

the price shall include for trimming and levelling. No blasting will be allowed without prior permission. Material which can be removed by pick or traxcavator, ripper or similar mechanical plant will not be classed as rock.

FOUNDATION EXCAVATIONS

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

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

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

SURPLUS SOIL DISPOSAL

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

TOP SOIL FOR SPREADING

Where required in the Bills of Quantities, top soil required for subsequent spreading over finished work shall be especially selected and shall be dumped in special heaps as indicated by the Architect. Such top soil shall be reasonably free from vegetation to the satisfaction of the Architect, and shall be compacted as little as possible in the heaps.

FILLING UNDER SURFACE BEDS IN BUILDINGS

Murram Filling

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

Hardcore Filling

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

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

MATERIALS FOUND IN EXCAVATIONS

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

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

FILLING OBTAINED FROM THE EXCAVATIONS

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

INSECTICIDE TREATMENT

Where described, the top surface of filling shall be treated with 'Aldrex 48' Pesticide (manufactured by the Shell Chemical Company of Eastern Africa Ltd.) to be applied by Rentokil Ltd., P.O. Box 44360, Nairobi, or other equal and approved firm, in accordance with the manufacturer's instructions and subject to a ten year guarantee to the satisfaction of the Architect.

DIOTHENE SHEETING

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

CONCRETE WORK

ARCHITECT/ENGINEER

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

CODE OF PRACTICE

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

SUPERVISION

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

CONTRACTOR'S PLANT, EQUIPMENT AND CONSTRUCTION PROCEDURES

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

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

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

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

LEVELS AND FOUNDATIONS

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

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

TOLERANCES

On all setting out dimensions of 6m and over a maximum non-accumulative tolerance of plus or minus 6mm will be allowed. On all setting out dimensions under 6m a maximum non-accumulative tolerance of plus or minus 3mm will be allowed. On the cross sectional dimensions of structural members, unless otherwise required by the drawings, a maximum tolerance of plus or minus 3mm will be permitted.

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

MATERIALS GENERALLY

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

SAMPLES AND TESTING

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

CEMENT

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

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

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

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

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

AGGREGATES

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

The grading of aggregates shall be within the limits set out in B.S. 882 and as later specified and the grading, once approved, shall be adhered to throughout the works and siliceous sand of good, sharp, hard quality and shall be free from lumps of stone, earth, loam, dust, salt, organic matter and any other deleterious substances. It shall be graded within the limits of Zone 1 or 2 of Table 2 of B.S. 882. Sea sand will not be accepted.

Coarse aggregate for concrete Classes '35', '30', '25', and '20' shall be black trap, Mazeras, or similar basaltic stone to the approval of the Engineer and coral aggregate will not be accepted. It shall be hard, clean and of good shape, free from dust, decomposed stone, clay, earthy matter, foreign substances or friable thin elongated or laminated pieces. It shall be graded within the limits of Table 1 of B.S. 882 for its respective nominal size.

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

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

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

WATER

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

EXPANSION JOINT FILLER

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

JOINT SEALER

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

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

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

CONCRETE STRENGTHS

Classes '35', '30', '25', and '20' concrete shall have the minimum strengths as given by works cube tests shown herebelow.

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

Nominal mix by volume	1:3:6 (Class 15)	1:4:8 (Class 10)
Cubic m. fine aggregate per 50Kg. bag of cement	0.12	0.16
Cubic m. coarse aggregate per 50Kg. bag of cement	0.24	0.32
Max. size of coarse aggregate	40mm	40mm

MEASURED PROPORTIONS OF CONCRETE

Cement

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

Aggregate (i) For Classes '35', '30', '25', and '20' concrete shall be measured by weight in a weigh batching machine as described hereafter.

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

WEIGH BATCHING MACHINE

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

CONCRETE CLASSES - '35', '30', '25', and '20'

The weights of fine and coarse aggregate to be used in concrete classes '35', '30', '25', and '20' shall be limited in accordance with the table below. The proportions of fine to coarse aggregate and cement which the Contractor proposes to use for the mix specified shall first be approved by the Engineer. The Contractor will then be required to prepare preliminary test cubes and have these cubes tested as described for work cube tests. The test results should be submitted to the Engineer in sufficient time for further tests to be carried out should they prove unsatisfactory. Cube strengths in the preliminary tests must show crushing strengths of at least 25% higher than the strengths specified for work cube tests. If the Contractor is unable to produce specified cube strengths, he will be required at his own cost to increase the cement of the mix until satisfactory results are produced.

Minimum Crushing Strengths

Age	Class 35	Class 30	Class 25	Class 20
7 days	24.5 N/mm2	21.0 N/mm2	17.5 N/mm2	14.0 N/mm2

28 days	36.0 N/mm2	31.0 N/mm2	26.5 N/mm2	21.0 N/mm2

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

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

Concrete shall be poured to the classes as follows:-

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

Class '35' designed	using 5mm to 20mm coarse aggregate
Class '30' concrete 1:1:2:3	using 5mm to 20mm coarse aggregate
Class '25' concrete 1:1 1/2:3	using 5mm to 20mm coarse aggregate
Class '20' concrete 1:2:4	using 5mm to 20mm coarse aggregate

Unless otherwise specified concrete shall be used as follows:-

High stress reinforced concrete	CLASSES '35' & '30'
Normal reinforced concrete	CLASSES '25' & '20'
Reinforced concrete member of thickness 75mm or less	CLASSES '20'
Surface beds, threshold, concrete surface channels and mass concrete fill	Concrete 1:3:6 mix
Concrete benching to cupboards and fittings and filling where described	Concrete 1:4:8 mix

MINIMUM CEMENT CONTENT - CLASSES '35', '30', '25', and '20'

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

Mix.	'35'	'30'	'25'	'20'	1:3:6	1:4:8
Minimum cement content (kg/m3)	350	300	300	260	220	150

WATERPROOF CONCRETE

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

WATER BAR

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

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

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

Formwork shall be designed with sufficient timber formers and blocking pieces to support the water bar and to ensure that it is not displaced during concreting. In the case of horizontal joints in vertical walling and similar members the formwork shall be so constructed as to permit the starter or upstand of concrete surrounding the lower half of the

water bar to be poured in the same operation as the slab or other concrete from which it springs. Formwork to walls or similar members where water bar is positioned at the base of the lift shall have sufficient openings not less than 300mm square at approximately 150mm to 300mm above the level of the water bar to permit checking that the water bar is correctly positioned and not displaced during concreting.

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

SEALOCRETE SUPERCOAT WATERPROOFER

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

TESTING EQUIPMENT

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

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

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

(c) Slump test apparatus;

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

WORK CUBE TESTS

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

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

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

(a) Cube No.

(b) Date made.

(c) Location in work.

(d) 7-day Test

Date
Strength required

(e) 28-day Test

Date
Strength required

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

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

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

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

MIXING AND PLACING OF CONCRETE

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

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

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

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

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

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

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

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

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

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

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

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

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

COMPACTION

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

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

During and immediately after placing, the concrete shall be thoroughly compacted by means of continuous tamping, spading, slicing and vibration. Vibration is required for all concrete of classes '35', '30', '25' and '20'

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

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

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

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

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

In consolidating each layer of concrete the vibrating head shall be allowed to penetrate and re-vibrate the concrete in the upper portion of the underlying layer. In the area where newly placed concrete in each layer joins previously placed concrete more than usual vibration shall be performed, the vibrator penetrating deeply at close intervals along these contacts. Layers of concrete shall not be placed until layers previously placed have been vibrated thoroughly as specified.

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

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

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

In addition to internal and external vibration the upper surface of suspended floor slabs shall be levelled with a tamping or vibrating screed prior to finishing. Vibrating elements shall be of the low frequency high amplitude type operating at a speed of not less than 3,000 r.p.m.

CONSTRUCTION JOINTS

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

Suspended concrete slabs are generally to be cast using alternate bay construction in bays not exceeding 13 metres in length. No two adjacent bays are to be cast within a minimum period of 48 hours of each other. The joints between adjacent bays are to be in positions agreed with the Engineer.

Under no circumstances shall concrete be allowed to tail-off, but it shall be deposited against stopping-off boards.

Before placing new concrete against concrete already hardened, the face of the old concrete shall be thoroughly hacked, roughened and cleaned, and laitance and loose material removed therefrom, and immediately before placing the new concrete the surface shall be saturated with water and covered with a coat of mortar at least twenty five mm in thickness composed of cement and fine aggregate in the proportions used in the concrete.

CURING AND PROTECTION

Care must be taken that no concrete is allowed to become prematurely dry and the fresh concrete must be carefully protected within two hours of placing from rain, sun and wind by means of hessian sacking, polythene sheeting, or other approved means. This protective layer and the concrete itself must be kept continuously wet for at least seven days after the concrete has been placed. The Contractor must allow for the complete coverage of all fresh concrete for a period of 7 days. Hessian or polythene sheeting shall be in the maximum widths obtainable and shall be secured against wind. The Contractor will not be permitted to use old cement bags, hession or other material in small pieces.

Concrete in foundations and other underground work shall be protected from admixture with falling earth during and after placing.

Traffic or loading must not be allowed on the concrete until the concrete is sufficiently matured, and in no case shall traffic or loading be of such magnitude as to cause deflection or other movement in the formwork or damage to the concrete members.

Where directed by the Engineer props may be required to be left in position under slabs and other members for greater period than those specified hereafter.

FAULTY CONCRETE

Any concrete which fails to comply with these specifications, or which shows signs of setting before it is placed shall be taken out and removed from the site. Where concrete is found to be defective after it has set, the concrete shall be cut out and replaced in accordance with the Engineer's instructions. On no account shall any faulty, honeycombed, or otherwise defective concrete be repaired or patched until the Engineer has made an inspection and issued instructions for the repair. The whole of the cost whatsoever, which may be occasioned by the need to remove faulty concrete shall be borne by the Contractor.

ROD REINFORCEMENT

The steel reinforcement shall be mild steel or high tensile steel as detailed on drawings or schedules and comply with the latest requirements of the following British Standards :-

Hot rolled bars for the reinforcement of concrete	to B.S. 4449 (metric units)
Cold worked steel for the reinforcement of concrete	to B.S. 4461 (metric units)
Hard drawn steel wire	to B.S. 4482 (metric units)

It shall be in metric sizes as detailed on the drawings.

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

FABRIC REINFORCEMENT

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

FIXING ROD REINFORCEMENT

Reinforcement shall be accurately bent to the shapes and dimensions shown on the drawings and schedules and in accordance with B.S. 4466. Reinforcement must be cut and bent cold and no welded joints will be permitted unless so detailed.

Reinforcement shall be accurately placed in position as shown on the drawings and, before and during concreting, shall be secured against displacement by using No. 18 S.W.G. annealed binding wire or suitable clips at intersections, and shall be supported by concrete or metal supports, spacers or metal hangers to ensure the correct position and cover.

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

The Contractor is responsible for maintaining the reinforcement in its correct position, according to the drawings, before and during concreting. During concreting a competent steel fixer must be in attendance on the concretors to adjust and correct the positions of any reinforcement which may be displaced. The vibrators are not to come into contact with the reinforcement.

Where reinforcement projects from a concreted section of the structure and this reinforcement is expected to remain exposed for some time, it is to be coated with a cement grout to prevent rust staining on the finished concrete. This grout is to be brushed off the reinforcement prior to the continuation of concreting.

POSITION AND CORRECTNESS OF REINFORCEMENT

Irrespective of whether any inspection and/or approval of the fixing of the reinforcement has been carried out as above, it shall be the Contractor's sole responsibility to ensure that the reinforcement complies with the details on the drawings or schedules and is fixed exactly in the positions shown therein and in the positions to give the prescribed cover. The Contractor will be held entirely responsible for any failing or defect in any portion of the reinforced concrete structure and including any consequent delay, claims, third party claims, etc., where it is shown that the reinforcement has been incorrectly positioned or is incorrect in size or quantity with respect to the detailed drawings or schedules.

SPACING BLOCKS

Spacing blocks of approved size and shape made of concrete similar to that used in the surrounding construction and fixed to the reinforcement or formwork by No. 18 S.W.G. wires set into the spacer blocks, or other approved means, shall be provided where necessary to ensure that the requisite cover is obtained. The Contractor is to include for providing sufficient such spacer blocks in his prices for steel reinforcement where a supplier has been nominated. Where composite blocks or other

forms of rib construction are used, spacer blocks are to be provided as shown on the drawings. These will generally consist of concrete blocks as described above made to fit the width of the rib less 3mm tolerance and with single or double grooves (depending on the number of reinforcement bars used per rib) in the top surface with wire ties at each groove.

CONCRETE COVER TO REINFORCEMENT

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

Foundations	50mm
Columns and walls	40mm
Beams	25mm
Slabs	15mm

FIXING FABRIC REINFORCEMENT

The fabric shall be free from scale, rust, grease or other substance likely to reduce the bond between the steel and the concrete and shall be laid with minimum 300mm laps and bound with No. 18 S.W.G. annealed iron wire.

In all ground slabs, unless otherwise specified a single layer of square mesh steel fabric shall be placed at a depth of 50mm below the top surface of the concrete. The fabric shall comply in all respects with B.S. 4483 and be of the size and weight specified or shown on the drawings.

The fabric shall extend to within 75mm of the expansion joints and shall have laps of at least 230mm at all joints in the fabric at junctions with reinforced concrete beams or other members. It shall be placed on top of the first layer of concrete as previously described and sufficient wire ties shall be provided to ensure that the fabric is held down securely.

FIXTURES AND INDENTATIONS IN CONCRETE

No openings, chases, holes or other voids shall be formed in the concrete without the prior approval of the Engineer. Details of any fixtures to be permanently built into the concrete including the proposed position of all electrical conduits 25mm and over in diameter shall be submitted to the Engineer for his approval before being placed.

CHASES, HOLES, ETC. IN CONCRETE

The Contractor shall be responsible for the co-ordination with the Electrical and other Sub-Contractors for incorporating electrical conduit, pipes, fixing blocks, chases, holes and the like in concrete members as required and must ensure that adequate notice is given to such Sub-Contractors informing them when concrete members incorporating the above are to be poured. The Contractor shall submit full details of these items to the Engineer for approval before the work is put in hand. All fixing blocks, chases, holes, etc., to be left in the concrete shall be accurately set out and cast with the concrete.

POSITION OF ELECTRICAL CONDUIT

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

The proposed position of all electrical conduits 25mm and over in diameter which are to be enclosed in the concrete shall be shown accurately on a plan to be submitted to the Engineer, whose approval shall be obtained before any such conduit is placed.

FORMWORK

The method and system of formwork which the Contractor proposes to use shall be approved by the Engineer before construction commences. Formwork shall be substantially and rigidly constructed of timber or steel or precast concrete or other approved material.

All timber for formwork shall be good sound clean sawn well-seasoned timber, free from warps and loose knots and of scantlings sufficiently strong for their purpose.

CONSTRUCTION OF FORMWORK

All formwork shall be of sufficient thickness and with joints close enough to prevent undue leakage of liquid from the concrete and fixed to proper alignment, level and plumb and supported on sufficiently strong bearers, shores, braces, plates, etc. properly held together by bolts or other fastenings to prevent displacement, vibration or movement by the weight of materials, men and plant on same and so wedged and clamped as to permit of easing and removal of the formwork without jarring the concrete. Where formwork is supported on previously constructed portions of the reinforced concrete structural frame, the

Contractor shall be in consultation with the Engineer to ensure that the supporting concrete structure is capable of carrying the load and/or sufficiently propped from lower floors or portions of the frame to permit the load to be temporarily carried during construction.

Soffits shall be erected with an upward camber of 10mm for each 4000mm of each horizontal span or as directed by the Engineer.

Great care shall be taken to make and maintain all joints in the formwork as tight as possible, to prevent the leakage of grout during vibration. All faulty joints shall be caulked to the Engineer's approval before concreting.

The formwork shall be sufficiently rigid to ensure that no distortion or bulging occurs under the effects of vibration. If at any time the formwork is insufficiently rigid or in any way defective the Contractor shall strengthen or improve such formwork as the Engineer may direct.

The Contractor's attention is drawn to the various surface textures and applied finishes required and the faces of formwork next to the concrete must be of such material and construction and be sufficiently true to provide a concrete surface which will in each case permit the specified surface treatment or applied finish.

All surfaces which will be in contact with concrete shall be oiled or greased to prevent adhesion of mortar. Oil or grease shall be of a non-staining mineral type applied as a thin film before the reinforcement is placed. Surplus moisture shall be removed from the forms prior to placing of the concrete.

Temporary openings shall be provided at the base of columns, wall and beam forms and at any other points where necessary to facilitate cleaning and inspection immediately before the pouring of concrete. Before the concrete is placed the shuttering shall be trued-up and any water accumulated therein shall be removed. All sawdust, chips, nails and other debris shall be washed out or otherwise removed from within the framework. The reinforcement shall then be inspected for accuracy of fixing. Immediately before placing the concrete the formwork shall be well wetted and inspection openings shall be closed. The erection, easing, striking and removing of all formwork must be done under personal supervision of a competent foreman, and any damage occurring through faulty formwork or its incorrect removal shall be made good by the Contractor at his own expense.

After removal of formwork, all projections, fins, etc., on the concrete surface shall be chipped off, and made good to the requirements of the Engineer. Any voids or honeycombing shall be treated as described in 'Faulty Concrete'.

STRIPPING FORMWORK

All formwork shall be removed without undue vibration or shock and without damage to the concrete. No formwork shall be removed without the prior consent of the Engineer and the minimum periods that shall elapse between the placing of the concrete and the striking of the formwork will be as follows:-

Beam sides, walls and inclined columns (unloaded)	2 days
Slab horizontal soffits (props left under)	3 days
Beam soffits (props left under)	7 days

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

Slabs	10 days
Beams	14 days

If the Contractor wishes to take advantage of the shorter stripping times permitted for beam and slab soffits when props are left in place, he must so design his formwork that sufficient props as agreed with the Engineer can remain in their original position without being moved in any way until expiry of the minimum time for removal of props. Stripping and re-propping will not be permitted.

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

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

FAIR FACE

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

On no account may such work be postponed to a later stage in the Contract. Fair face surfaces shall be clean, smooth, even, true to form and free from all board marks joint marks, honeycombing, pitting, etc. The Contractor is permitted at his own expense to provide smooth lining to the forms which will achieve the required finish without rubbing down. All rubbed down work must be lightly washed with plain cold water at the completion of the Contract, and not before the cement grout used in the finish is at least four weeks old after initial mixing

BUSH HAMMERED FINISH

The concrete surface prior to the tooling of this finish shall resemble in all respects that produced as 'Fair Face' above. Particular care is required to achieve complete compaction of the concrete.

The bush-hammering shall be carried out using approved tools and shall produce an even, tooled appearance. All arrises, projections, etc., shall remain true and sharp and no rounding off of edges shall be permitted. The Contractor is to take care that no reinforcement is exposed and that in any case no tooling penetrates the concrete surface by more than 10mm.

The Contractor shall, prior to any bush-hammering taking place, provide a sample measuring 1.00m square to the Engineer indicating the standard of bush-hammering to be achieved. This when approved by the Engineer will form the standard for the entire works. Any surface not complying with this standard shall be removed or made good to the Engineer's satisfaction at the Contractor's expense.

TAMPED FINISH

Areas so specified shall be finished at the time of casting with a tamped finish to the Engineer's approval produced by an edge board. Board marks are to be made to a true pattern and will generally be at right angles to the traffic flow. Haphazard or diagonal tamping will not be accepted.

WROT LINED FORMWORK

The shuttering shall be constructed of wrot tongued and grooved boarding, plywood or blockboard lined with approved laminated plastic sheeting to produce a concrete surface with truly flat surface completely free from all air bubbles, joint marks, honeycomb and other pittances and blemishes to the approval of the Engineer.

Should the Contractor desire to use alternative materials he should submit his proposals to the Engineer for approval.

Should the Contractor fail to obtain approval and the Architect subsequently rejects the work, the Contractor will at his own expense carry out all work necessary to attain the approval of the same.

BOARD MARKED FINISH

Where so directed or measured the finish shall be that of a board marked pattern in panels, the boards shall be arranged vertically or horizontally and of widths and sizes all as detailed on the drawings. All exposed concrete will be left unpainted and therefore every care and attention shall be paid to obtain a satisfactory visual appearance and the maintenance of the same throughout the building operation. The finished surfaces shall be free from blow holes, hungry patches and other blemishes, and a sample panel is to be provided and approved by the Engineer before work commences.

Unless otherwise specified, the formwork shall be rip sawn softwood to the Engineer's approval and shall have a sufficiently strong grain to impart a corresponding pattern to the concrete surface. Unless otherwise approved it shall have four uses only and shall be carefully cleaned from adhering grout after each use. It shall be lightly oiled with an approved no-staining oil.

CHISEL DRESSED FINISH

Where specified a chisel dressed finish is to be carried out on any grade of concrete but not until it is at least 30 days old. The surfaces are to be fully chisel dressed to remove a maximum of 12mm (average 9mm) of the surface to expose the aggregate without excessive cracking or breaking thereon.

Where the drawings show details of arrises of columns, beams, etc., these are to be pre-formed with timber fillets set in the formwork and care must be taken in working up to those to preserve a clean line. For vertical surfaces of walls and columns, particular care must be taken to remove all sharp projections. For beam soffits this requirements is not necessary.

All chisel dressed surfaces are to have the margin chisel dressed by hand for a minimum width of 75mm commencing from the fillet edge. Thereafter mechanical chisel dressing may be used but the Contractor must ensure that a uniform texture and even plane surface is achieved. The use of pointed steel tools for both hand and mechanical chisel dressing is essential. Upon completion the surfaces are to be thoroughly wire brushed and washed down and protected during the course of construction from damage, dirt, cement grout, etc.

PRECAST CONCRETE

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

The maximum size of coarse aggregate in precast concrete shall not exceed 20mm except for thicknesses less than 75mm where it shall not exceed 12mm.

The compaction of precast concrete shall conform with requirements given elsewhere in these Specifications except for thin slabs where use of immersion type vibrators is not practicable. The concrete in these slabs may be consolidated on a vibrating table or by any other methods approved by the Engineer.

Steam curing of precast concrete will be permitted. The procedure for steam curing shall be subject to the approval of the Engineer.

The precast work shall be made under cover and shall remain under the same for seven days. During this period and for a further seven days the concrete shall be shielded by sacking or other approved material kept constantly wet. It shall then be stacked in the open for at least a further seven days to season before being set in position. Where steam curing is used these times may be reduced to the approval of the Engineer.

Precast concrete units shall be constructed in individual forms. The method of handling the precast concrete units after casting, during curing and during transport and erection shall be subject to the approval of the Engineer. Providing that such approval shall not relieve the Contractor of responsibility for damage to precast concrete units resulting from careless handling.

Repair of damage to the precast concrete units, except for minor abrasions of the edges which will not impair the installation and/or appearance of the units will not be permitted and the damaged units shall be replaced by the Contractor at his own expense.

Moulds for 'Fair Face' precast work are to be made of metal or are to have metal or plywood linings or are to be other approved moulds which will produce a smooth dense fair face to the finished concrete suitable to receive a painted finish direct and free from all shutter marks, holes, pittances, etc. In his prices for such precast work the Contractor shall include for all rubbing down to produce the finish required, to the satisfaction and approval of the Engineer.

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

COMPOSITE FLOOR OR ROOF SLABS

Concrete hollow blocks for used in the composite floor slabs are to be of the sizes required as shown on the drawings and with 30mm wall thickness and are to be of adequate strength to support the concrete during placing and consolidation by vibration. Blocks are to be manufactured in accordance with the procedure specified in B.S. 2028 and to be of a mix not weaker than 1:4:8 cement : sand : aggregate using maximum size aggregate.

Concrete blocks are to be cured for at least 28 days before use on the site. During the first seven days of curing, blocks are to be kept permanently damp and protected from exposure to sun and wind.

Concrete blocks are to be well wetted before the pouring of concrete.

COMPOSITE FLOOR CONSTRUCTION

The hollow block floor construction is generally to be as shown on the Engineer's drawings.

Care shall be taken in placing blocks to ensure that they are set out in accordance with the details shown on the drawings and that they run truly in line without encroaching on the width of the insitu ribs.

The open ends of hollow blocks, if adjacent to concrete to be placed insitu, are to be plugged or stopped to prevent the concrete from flowing into the void and the Contractor is to include for this in his prices.

The Contractor should note that slip tiles are not to be used to the soffit of ribs and he is to take this into consideration in pricing the items of formwork to the soffit of hollow block floor construction.

Before concreting is carried out the blocks are to be thoroughly wetted.

Care should be taken during concreting that the width of ribs between the rows of blocks and the solid insitu concrete shown on the drawings adjacent to supporting beams is not encroached upon by the blocks.

It is essential that the concrete topping be poured at the same time as the ribs between hollow blocks.

Reinforcement shall be positioned accurately with required cover in accordance with the drawings and using the particular spacing blocks with wire ties as previously described. Spacer blocks shall be provided in ribs at not more than 1.2m centres. Care must be taken during concreting that the reinforcement is not displaced.

Where holes for services, etc. occur, the necessary holes or pockets shall be accommodated by the replacing of a hollow block by insitu concrete or the widening of a rib all in accordance with the Engineer's instructions.

Prices for holes, etc. through hollow block construction are to include the re-arrangement or substitution of the hollow block with sold concrete in addition to the actual formation of the hole.

CONCRETE SURFACE BEDS

Concrete for surface beds shall be Grade '20'.

Before placing concrete and where specified or shown on the drawings a layer of 500 gauge polythene or diothene sheeting shall be laid on the base course. Minimum 300mm laps shall be provided at all joints.

The concrete shall be placed as soon as possible after being mixed. In transporting the concrete, adequate precautions shall be taken to avoid damage to the prepared base. The concrete shall be spread to such a thickness that when compacted it shall have the finished thickness as specified or shown on the drawings. A layer of concrete 50mm less than the finished thickness shall first be spread and struck off at the correct level to receive the top fabric reinforcement.

The top layer shall then be added. Not more than 30 minutes shall elapse between spreading the bottom layer. The Contractor shall be responsible for maintaining the reinforcement in its correct position during the placing and compaction of the concrete.

The compaction and finishing of the concrete shall be effected by immersion vibrators and a hand or mechanical tamper weighing not less that 10Kg per meter run and having a tamping edge shod with a steel strip 75mm wide fixed to the tamper by countersunk screws. Immersion vibrator with 'spade' attachments will be permitted. Compaction shall be continued until a dense, sealed surface finish is achieved. Over-compaction causing an excessive amount of fines to be brought to the surface shall be avoided.

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

The level shall be within or - 6mm of the levels specified.

The falls shall be within 10% of the falls specified.

The smoothness shall be such that departure from a 3.000m straight edge laid in any direction shall not exceed 3mm.

Minor irregularities shall be made good by the use of a steel float but in no circumstances shall mortar be used to make good the surface.

As soon as the surface has been finished, it shall be protected against too rapid drying by means of damp hessian, 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 further 21 days. The most critical period is the first 24 hours after placing and 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.

EXPANSION JOINTS IN CONCRETE SURFACE BEDS

Expansion joints shall be positioned and constructed as shown on the drawings. The joints in the surface beds shall be absolutely square and true to line and position.

All joints in surface beds shall be formed to the patterns and shapes to coincide exactly with the joints in the surface finish or as otherwise indicated on the drawings. Formwork shall be manufactured from steel of heavy angle section and be to the Engineer's approval. The Contractor shall submit drawings of the forms he intends to use and obtain the Engineer's approval before fabrication. Panels shall be poured in alternate bays as agreed with the Engineer. No construction joints other than those indicated on the drawings shall be submitted.

NOTES CONCERNING MEASUREMENT AND PRICING

The Contractor must allow for all costs incurred during the 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.

Formwork (use and waste only) is measured net to the actual face of the concrete to be supported and the 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, notchings, etc., and for fixing at the various levels including battens, struts, and supports and for bolting, wedging, easing, striking and removal. Prices for linear items such as boxings shall include for angles and ends. Strutting has been measured at varying levels to soffits only and prices for other items must include for strutting at any level.

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, providing all necessary tying wire, and supports and all extra material in laps.

Prices of all precast concrete shall include for all moulds, finishings as described, handling reinforcement, hoisting and fixing at the required levels, bedding, jointing and pointing in cement and sand (1:5) mortar, also for casting or cutting to the exact lengths required and any waste resulting from such cutting. The sizes of weathered or moulded items stated are extreme sizes.

Prices for suspended hollow tile composite floor and roof slabs must be 'all inclusive' to include for concrete hollow tiles, in situ concrete ribs, concrete topping, concrete filling to open ends of hollow concrete tiles.

Concrete in main beams has been measured to the full width thereof and for full depth to top of slab level and composite slabs are measured separately, the net area between same. No adjustment will be made in these measurements for any projection of ribs, reinforcement, etc., into main beams or floors etc., to obtain bearings, which are deemed to be covered in the Contractor's rates.

Prices for expansion joints shall include for cutting to size and all temporary supports and prices for expansion joint sealers shall include for all temporary battens or fillets required to form the necessary grooves.

STRUCTURAL STEELWORK

APPROVED SUB-CONTRACTOR

The whole of the structural steelwork is to be executed by a specialist Sub-Contractor who is to be specifically approved by the Engineer and the Contractor will be required to make arrangements for the execution of this work and bear all expenses incurred. No change in the rates for this work inserted by the Contractor in these Bills of Quantities will be allowed

ARCHITECT/ENGINEER

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

QUALITY OF MATERIAL AND WORKMANSHIP

The quality of all materials and workmanship used in the execution of the works shall comply with the requirements of current relevant British Standard and Codes of Practice, including all the latest amendments.

BRITISH STANDARDS AND CODES OF PRACTICE

B.S. 4360.....	Weldable Structural Steels
B.S. 5950	The use of Structural Steel inBuilding.
B.S. 4 (Part 1)	Hot Rolled Sections
B.S.4848 (Part2).....	Hot Rolled Hollow Sections.
B.S. 2994 & 1449	Cold Formed Steel Sections

B.S. 5135	General Requirements for the Metal Arc Welding of Structural Steel Tubes to B.S. 6222,(B.S. 5125 will be considered to apply to the requirements for weldingofhotrolled hollow sections to B.S. 4848 Part 2).
B.S. 6323 Parts 1 - 8	SteelTubesfor Mechanical, Structural & General Engineering Purposes.
B.S. 1856	General Requirements for the Metal Arc Welding of Mild Steel.
B.S. 639	Covered Electrodes for the Metal Arc Welding of Mild Steel
C.P. 2008	Protection of Iron & Steel Structures from Corrosion

TESTS

The Engineer may at any time require any materials to be tested in accordance with the requirements of the Standards listed above. The cost of all successful tests shall be borne by the Employer. The Contractor shall, if required by the Engineer, promptly supply at his own expense test pieces. The costs of tests on materials failing to comply with these Standard shall be borne by the Contractor. If in the opinion of the Engineer, faulty material and/or workmanship has been used in the works, the Contractor may be directed to dismantle and cut out the parts concerned and remove them for examination and testing. The cost of dismantling, cutting out and making good to the approval of th Engineer shall be borne by the Contractor.

FABRICATION

The standard of work and the general procedure to be followed during fabrication shall be in accordance with B.S. 449. The Contractor must ascertain all dimensions on the site prior to commencement of fabrication.

(a) Cutting & Bending - All members, plates, brackets, etc., shall be neatly and accurately sheared, sawn, or profiled to the required shape as shown on the drawings. Where steel is oxy-cut to shape, care shall be taken to preserve the full finished sizes required.

If members or plates are bent or set, the bends or sets shall be correctly made to the radii or angles specified without leaving hammer marks. The materials may be heated to permit this. Material that has been heated should be annealed to approval.
(b) Punching & Drilling - Holes for black bolts shall be drilled or punched 2mm larger in diameter than the bolt size. Holes for high tensile friction grip bolts shall be drilled or sub-punched and reamed to 2mm larger in diameter than the specified bolt size. All drilled holes shall be parallel sided and shall be drilled with the axis of the holes perpendicular to the surface. Badly drilled holes shall either be reamed out to approval and larger bolts fitted or otherwise as directed. All rough arrises shall be ground off. Holes for bolts in material thicker than 15mm must be drilled. When holes are drilled in one operation through two or more thicknesses of material, the parts shall be separated after drilling and all burrs removed before assembly. Holes for bolts shall not be formed by a gas cutting process. Holes formed or enlarged by oxy-cutting will not be accepted and must be filled to approval by electric welding and re-drilling.

(c) Bolting - All bolts used shall be of such length that at least one full thread is exposed beyond the nut after the nut has been tightened. Where a nut or bolt head would bear on an inclined surface, a bevelled washer of the correct shape shall be interposed between the two surfaces. Bevelled washers shall not be allowed to get out of position during fabrication and erection and for this purpose may be spot welded to the steel surface. Bevelled washers for use with high tensile bolts shall not be welded.

(i) Black Bolts, Nuts and Washers

Black bolts shall comply with the requirements of B.S. 916. (B.S.W. Threads).

(ii) Close Tolerance Bolts

Close tolerance bolts shall conform to B.S. 916.

(iii) High Strength Friction Grip Bolts

(a) General grade bolts to B.S. 3692.

(b) Load indicating bolts manufactured by G.K.N. Ltd. or any other approved manufacturer.

(c) High tensile bolts to B.S. 4395.

(iv) Rawlbolts

Rawlbolts shall be those manufactured by Rawlplug Company Ltd. or any other approved manufacturer.

(v) Washers

Washers to B.S. 4320.

Washers for high strength friction grip bolts shall be appropriate to the type and quality of the bolt specified.

(vi) Rivets

The steel used for rivets shall be in accordance with B.S. 4360 and in the case of high tensile steel rivets shall be so manufactured that they can be driven and the heads formed and the physical properties not impaired.

(d)Pressed Steel Sections

Pressed or cold rolled steel purlins and girders shall be to the sizes indicated on the drawings and shall be formed from approved steel strip with a minimum yield strength of 175N/mm2.

The sections shall be manufactured straight and free from twist. The tolerance away from straightness shall not be greater than 2mm for every 2000mm in length along any folded edge.

(e) Electric Welding

All welding shall be carried out in strict accordance with the requirements of B.S. 5135 and B.S. 2624 as appropriate and electrodes shall comply with B.S. 639. Only approved and certified welders shall be used

Fusion faces shall be free from irregularities such as tears, fins, etc., which would interfere with the deposition of weld metal.

Fusion faces shall be smooth and uniform and shall be free from loose scale, slag, rust, grease, paint and other deleterious material.

All welds shall be of approved type and finished size as specified. Welding shall be carried out in such sequence that minimum distortion of the parts welded results.

Planing or machine flame cutting shall carry out preparation of edges for welding. Manual flame cutting will not be permitted.

Parts to be welded shall be maintained in their correct relative positions during welding, preferably by jigs.

Multi-run welds shall be carried out with each run closely following the previous run but allowing sufficient time for the proper removal of slag.

The Contractor shall ensure that each run is inspected and any unsatisfactory weld cut out and remade to approval.

Welds in material 25mm or greater in thickness shall be made by the Argon arc or similar approved process, and special precautions shall be taken to prevent weld cracking.

Unless otherwise specified, the minimum size of fillet shall be 6mm.

On completion, welds shall present a smooth and regular finish. Weld metal shall be solid throughout with complete fusion between weld metal and parent metal and between successive runs throughout the joint

Defects shall be cut out and made good to approval in sound weld metal.
The external faces of butt welds are to be ground smooth on completion to the approval of the Engineer.

SHOP AND FIELD CONNECTIONS

(a) Rolled Sections

All shop connections shall be electric welded or bolted with high tensile bolts.

No bolts used shall be less than 12mm diameter and no weld less than 40mm in length. At least two bolts shall be used in connections transmitting loads unless otherwise indicated by the Engineer.

No weld of length less than four times the nominal fillet size shall be deemed capable of carrying load.

Beam to column connections not detailed shall be on 'Standard' top and bottom cleat connections with the load carried on the bottom cleat. 'Standard' web connections shall be used for connecting beams to beams.

Field connections shall be as detailed, i.e. bolted with high tensile or black bolts in drilled holes. Black bolts in punched holes will only be permitted for connections carrying a designed load or for connections to timber members.

(b) Structural Hollow Sections

Hollow sections shall be connected by electric welding unless specified otherwise.

The designs of welds shall be in accordance with Clause 6.6 of B.S. 5950.

Butt welds in tension members will not be permitted unless the prior approval of the Engineer in writing has first been obtained.

Butt welds where permitted, shall be made with the fusion surfaces of the ends of each member properly prepared and the member properly aligned.

ASSEMBLY

(a) Trusses and Portal frames

Trusses and portal frames shall be carefully set out to the dimensions shown on the drawings.

Where it is required that trusses be cambered, such camber shall be provided by bending the bottom chord to an arc of a circle.

Not withstanding any dimensioned spacing of purlin cleats, the Contractor shall ensure that purlin cleat spacing is satisfactory for the available stock lengths of roof sheeting. However, the Engineer's approval must first be obtained before any alteration is made in purlin spacing or sheeting sizes.

Splices in portal and other frames shall be made where shown on the details or where directed by the Engineer.

(b) Boxed Members

Abutting edges of boxed members shall be connected and sealed with a continuous weld to exclude the entrance of moisture. Where specified such welds shall be ground flush to approval.

(c) Shop Assembly

Assembly of units in the shop prior to transporting to the site must be inspected by the Engineer before painting. The assembled work shall be laid out in the shop or yard such that all parts are accessible for inspection and testing.

The Contractor shall furnish all facilities for inspection and testing of the works and must notify the Engineer on every occasion materials are ready for inspection.

(d) Marking

All members of the structures to be site assembled shall be marked in accordance with the shop details and marking plans submitted to the Engineer for approval.

ERECTION

(a) Site Dimensions

Erection shall not commence unless and until accurate site dimensions have been taken by the Contractor. No claims will be considered should site dimensions differ from those on the drawings. Any modifications to the structural steel required in order to comply with site dimensions shall be made on the ground to the Engineer's approval before erection is commenced.

(b) Safety

All erection shall be carried out by competent and experienced personnel and the Contractor shall take every care to safeguard members of the public, workmen, and adjoining property against injury and/or damage. The Contractor shall be held responsible for all damage caused to the structure, workmen, or other property during erection.

All gear used shall be of adequate strength and shall comply with all current Regulations.

During erection the work shall at all times be adequately bolted, guyed and/or braced to make the structure secure.

(c) Storage and handling

Steel members shall be stored, handled and erected in such a manner that no member shall be subjected to excessive stresses which could have adverse effect on the properties of the steel. If, in the opinion of the Engineer, the steelwork has been subjected to such treatment, the Contractor shall remove the member from the site and replace it at his own expense.

(d) Erection Notes

No member or part of a member which has been bent or distorted shall be erected in that condition. All straightening shall be done on the ground.

Stanchions shall be wedged to line and level on steel or cast iron wedges and checked by the Engineer. After acceptance, stanchion bases shall be grouted to approval before wedges are removed. Unless otherwise shown on the drawings, all stanchions shall be left
truly vertical and correct to line and level. Beams, girders, etc., shall be erected level unless otherwise shown, and correctly positioned.

Trusses and open web joists shall be carefully handled at all times and during erection shall be lifted at such points and in such a manner as will preclude any possibility of damage from excessive stresses.

Packing plates, shims, washers or similar adjusting pieces found necessary to accommodate tolerances in structural site dimensions shall be provided and fixed to the approval of the Engineer.

Immediately after erection, each truss shall be made secure by purlins, bracing or guys to approval of the Engineer.

Bracing shall be fixed in position as soon as dependent portion of the work is completed.

(e) Tightening and Testing High Tensile Friction Grip Bolts

Before assembly, the contact surfaces, including those adjacent to the washers, shall be descaled, and be free from dirt, oil, loose scale, burrs, paint (except priming paint), pits and other defects that would prevent proper seating of the parts.

Bolts shall be fixed with approved hardened flat or tapered washers as required between the bolt and nut and the softer mild steel.

When bearing faces of the bolted parts have a slope of more than 1 in 20 with respect to a plane normal to the bolt axis, square smooth bevelled washers shall be used to compensate for the lack of parallelism.

All bolts shall be tightened by the 'Turn of Nut' method and as approved by the Engineer to achieve in all bolts a minimum tension equal to the proof load.

(f) Grouting

Unless otherwise detailed on the drawings, a space of not less than 40mm shall be provided between undersides of column base plates and footings, and between all beams and roof truss bearings and concrete pads.

After each column, beam or roof truss has been wedged up to a line and level and fixed in position to approval, the space between footing or pad and the underside of the column base plate or steel member shall be grouted with a mixture of one part of Portland cement and one part of approved washed sand (1:1).

The Portland cement and sand shall be thoroughly mixed together with sufficient water to produce a mixture of 'damp earth' consistency and shall be used within twenty minutes of mixing. The caulking mixture shall be packed tight into the space between baseplate and foundation and protected from damage until it sets.

PAINTING

(a) Paints

All paints are to be obtained from suppliers approved in writing by the Engineer.

Paints are to be delivered to the site or to the Contractor's fabrication site in the original containers as supplied by the manufacturer with seals unbroken and are to be used in strict accordance with the manufacturer's instructions. Manufacturer's representatives are to be free to visit the site and inspect materials for laboratory analysis.

Paints are not be thinned unless instructed by the Engineer. No external painting is to be carried out during rain or when rain is likely to occur before the paint has had time to dry. All surfaces are to be dry and free from moisture during painting.

(b) Preparation for Painting

All structural steel shall be thoroughly scraped and wire brushed to remove mill scale and rust. Dirt, grease and oil shall be washed off with white spirit and the steel allowed to dry.

(c) Application

A first coat of Red Lead Graphite Primer or other approved primer shall be applied after fabrication of the works has been completed. A minimum of 24 hours shall elapse before the steel is moved from its position after painting has been completed. After delivery to site, the steel shall be carefully examined and all areas where the priming coat has been damaged and/or where rust has developed shall be washed with white spirit and wire brushed as necessary and a further priming coat as for the first coat applied to completely cover the damaged areas.

During erection, surfaces of steel which are to be in contact shall be painted with one further coat of primer as previously described and the surfaces brought together whilst the paint is still wet.

After erection, paint a second and finishing coat of 'Oil Company Aluminium Paint 368/36' or other finishing paint of standard as for steelwork. Welds shall not be painted over until they have been deslagged, inspected and approved.

Steel purlins and side rails shall generally be painted as for steelwork when the following specification shall be used.

1st Coat - Red Oxide Zinc Chromate Primer or other approved primer
2nd Coat - Robbialac 'Oil Company Aluminium Paint 368/36' or other equal and approved Aluminium Paint

The interior of mild steel gutters shall be prepared as previously described and painted with 2 coats of Robbialac Epilac Coal Tar Epoxy Paint or other approved paint.

PRICES, MEASUREMENTS AND PAYMENT

Prices quoted by the Contractor shall be based on the calculated weights of steel, and shall include for manufacture, painting, and supply, all as described in the Bills of Quantities, specified, and shown on the drawings, including the cost of delivery to the site or other agreed place or places and the supply of all bolts, rivets, plugs, gussets, cleats, to complete the erection of the works.

Prices shall include for erection, (all labour, scaffolding, and other erection equipment necessary) and cover the cost of additional prime coat painting as previously specified. The prices shall also include for lining up, levelling and plumbing but not for grouting up of the bases.

The basis for payment for steelwork shall be the calculated steel weights of the structure. Any variation from the original design on which the tender was based, which results in either an increase or decrease in calculated weight of the structure as completed, shall result in the appropriate additions or deductions to the submitted tender totals.

Any written instruction from the Engineer which may result in additional work over and above that for which the Contractor quoted will be considered as extras and shall be paid for on the basis of calculated additional steel weights.

APPENDIX D

EXTERNAL WORKS SPECIFICATIONS

APPENDIX 'D'

EXTERNAL WORKS SPECIFICATION

ARCHITECT OF ENGINEER

Whenever the word 'Engineer' is used in these descriptions of materials and workmanship, it shall, where appropriate, be read and construed as the 'Architect', Landscape Architect or, as the 'Civil Engineer' in which instance the Landscape Architect or Engineer shall be deemed vested with the duties of and be the representative of the Architect.

DISCREPANCIES IN DESCRIPTIONS

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

TESTS AND SAMPLES

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

KENYA STANDARDS

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

GENERAL

The provisions of other sections of this Specification shall, where appropriate, apply to this section. The works shall be executed in accordance with consultants drawings and designs.

ROADS

Topsoil

Topsoil (150mm depth average) along the full width of the road should be removed and spread evenly on places indicated on site by the Architect.

Sub-Grade

The sub-grade shall be shaped to the correct cambers, gradients and levels as shown on the drawing for the full width of the crown and shall be compacted to minimum 95% MDD or as specified on the drawings

The sub-grade shall be constructed in such a manner and to such levels that no single point deviates more than $\pm$ 30mm from the stipulated levels.

Sub-grade should be kept continuously drained and any damage caused by water accumulating on or running off the surface shall be made good at the Contractor's expense.

Before any material is laid on sub-grade, the sub-grade shall be cleaned of all foreign matter, any pot holes, loose materials, ruts, corrugations, depressions and any other defects due to improper drainage, traffic or any other cause shall be corrected to the satisfaction of the Architect. If the Architect may direct, the Contractor shall regrade and recompact the sub-grade to the line and level at his own expense. The relative compaction of the sub grade shall be tested in accordance with BS 1377.

The Architect's approval of the sub-grade after testing shall in no way relieve the Contractor of any obligation under the Contract.

GRAVEL

The gravel shall be from an approved source, quarried so as to exclude vegetable matter, top soil or clay. The C.B.R. of gravel as determined for a sample compacted to 100% maximum density (as defined in B.S. 1377) and allowed to soak in water for 4 days, shall be not less than 30.

SUB-BASE

The gravel sub-base shall be finished to the correct camber, gradient and level to receive the carriageway base-course. This layer shall be compacted at MDD and Optimum Moisture Content to a relative compaction of 100 per cent maximum density, as determined under B.S. 1377. It should also give a minimum C.B.R. value of 30%, maximum plasticity Index of 15% and plasticity Modules of 250.

HAND PACKED STONE BASE COURSE

(i) The stones should not contain deleterious matter and should be free from dust, and admixtures of softer stones.

(ii) The rock from which the stones are produced should comply with the following.

A.C.V. (Aggregate Crushing Value) - not greater than 40%

L.A.A. (Los Angeles Abrasion) - not greater than 60%

S.S.S. (Sodium Sulphide Soundness) - loss on 5 cycles not more than 12%

(iii) Binder material used shall be crusher fines of P.I. not greater than 8%.

Before commencing the preparation of stones the Contractor must submit to the Architect samples of stone he proposes to use and these when approved shall form the standard for the work.

The stones shall be laid by hand with the long ends vertical, laid closely and all intestices filled with smaller stones. Maximum thickness shall be 200mm.

The stone layer shall be compacted with a roller not less than 12/16 tonnes weight. Rolling should be longitudinal and shall commence from the outer edges of the road. Rolling shall continue until there is virtually no movement under or ahead of the roller.

After a few passes of the roller the evenness of the surface will be checked and depressions shall be made good by adding additional material or otherwise as the case may be and rolling continued.

When the required firmness of the layer has been obtained the voids in the layer shall be filled with the binder material. The binder material shall be spread in a thin layer and should be brushed and rolled down into the voids. Water shall be sprayed evenly over the surface during this process to ensure complete filling of all the voids.

The finished level of the surface should be true to shape and the level specified so that no point on the finished surface deviates by $\pm$ 20mm of the specified levels.

ASPHALT CONCRETE

The premix surfacing shall consist of a prime coat and a 38mm thick premix wearing course.

Prime Coat

The primer used shall be MC 1 or similar bitumen emulsion applied between the temperature 45 degrees - 85 degrees Centigrade at the rate of 1 litre/sq.m.

Prior to application of the primer, all loose material shall be brushed off the base course surface to the satisfaction of the Architect. The Architect may direct a light wetting of the surface with water, to enhance the penetration.

The primer shall be spread in one even layer to the widths as shown on the drawings or as directed by the Architect, by a pressure distributor. Hand spraying shall not be permitted except in small areas, when approved by the Architect.

The primed surface of the road shall be closed to all traffic. However, where it is necessary to cross the primed area, a layer of sand or crusher fines shall be spread at the rate of 2.5 Kg./sq.m. along the width required.

The primed area shall be allowed to cure for 24 to 48 hours or as directed by the Architect.

Wearing Course

The asphalt concrete shall be continuously graded asphalt for flexible wearing course. The grading shall be as specified below and the aggregate shall be as specified below and the aggregate used shall have:-

LAA – Max 40%
ACV – Max 30%
SSS – Max 12%
Flakiness Index – 25%

Grading for Asphalt concrete

Sieve Size	0/14mm
20mm	100%
14	90 – 100%
6.3	55 – 85%
4	46 – 75%
2	35 – 60%
1	25 – 45%
0.425	14 – 32%
0.300	11 – 27%
0.150	6 – 17%
0.075	3 – 8%

The thickness of the wearing course shall be 38mm after compaction. The nominal size of aggregate used shall be 13mm and nominal bitumen content shall be between 4.5 to 6.5% by weight of the mix. The bituminous binder used shall be straight run of grade 80/100 penetration.

The aggregate for premix shall consist of approved crushed stone, shall be hard, clean, free from vegetable matter and soil, dust or other deleterious matter and free from admixture of softer stone. The Contractor will be required to

submit to the Architect samples of the stone he proposes to use and these, when approved, shall form the standard for the work.

Before the premix is laid the existing surface shall be cleaned of all loose or deleterious material. No premix shall be placed until the surface has been approved by the Architect.

Premix shall be laid by approved mechanical paver to the correct thickness, line and camber. The mixture shall be laid at a temperature between 120 degrees and 150 degrees Centrigrade.

Immediately after spreading, the mixture shall be compacted by a 5 - 10 tonne smooth steel wheel roller and final compaction shall be by a pneumatic tyred roller.

Any place not accessible to a roller shall be compacted by hand tampers whose weight shall not be less than 12 Kg. and shall have a tamping face of not more than 0.03 sq.m.

The finished surface shall be to the required gradients and cambers and shall be well rolled and neatly finished off at all kerbs and walls.

CONCRETE PIPES

Concrete pipes and fittings shall conform to B.S. 556 and shall have spigot and socket joints.

EXCAVATION

The excavation shall be made true and even to falls, the bottom being trimmed to the correct levels and well rammed. The minimum width of the trench at the bottom shall be the external width of the pipe plus 300mm. Wherever soft places in excavated areas are encountered, the Contractor shall excavate such soil to a hard foundation and replace with hard filling before any drains are laid. Any trenches excavated in error to a greater depth than required shall be backfilled to the required level with hard filling at the Contractor's own expense.

DRAIN RUNS

Surface water drains are to be to the diameters and of the materials as shown on the drawings, laid in straight lines and with uniform falls to the levels indicated. No alterations to the sizes, falls and runs shown on the drawings are to be made without previous consent.

JOINTING CONCRETE PIPES

Joints are to be made with best quality gaskin dipped in cement grout immediately prior to use, caulked in, and finished off to not more than one third the depth of the socket.

Pipe runs are to be laid dry and jointed in one operation with cement and sand (1:2) trowelled to a smooth face at an angle of 45 degrees to the pipes, and properly cored as the work proceeds.

Where an approved proprietory spigot and socket pipe is used, joints shall be made in accordance with the manufacturer's instructions.

BACKFILLING

No backfilling shall be carried out until drains, manholes and chambers etc., have been tested and approved. The whole of the backfilling shall be properly consolidated and shall be put back in 250mm layers. No mechanical rammers may be used until at least 600mm of consolidated material has been returned over the pipes. Only approved material may be used for backfilling. Where pipes are unprotected by concrete haunching, the first operation in filling shall be to handpack and tamp selected fine material around the lower half of the pipes to buttress them to the sides of the trench.

In the case of pitch fibre and plastic pipes, the first filling shall completely cover the pipe and shall be of material free from stones or hard material which would be retained on a 25mm sieve.

TESTING NEW DRAINS

All surface water drains will be tested to 1500mm head of water. No drains are to be covered in or further proceeded with until such test has bee made, repeated as necessary, and passed by the Architect and Local Authority.

After passing the test the head of water is to be maintained until the concrete bed, haunching or covering is complete. Immediately prior to completion of the Contract the main and branch drains shall be tested by passing through them a ball or disc 6mm less in diameter than the bore of the pipe, and the water test repeated, as required by the Architect and Local Authority.

PROTECTION OF WORK

The drains are to be laid to suit the general progress of the building work and at such times and in such a manner as to be adequately protected against damage and deterioration. The whole of the work is to be maintained and handed over in a sound and clean condition on completion of the Contract.

INVERT BLOCK DRAINS

Precast concrete invert blocks and side slabs shall be formed of concrete (Grade 20) to the dimensions shown on the drawings. Each course of side slabs required in the Bills of Quantities shall be interpreted as one complete row of side slabs to one side of the channel concerned. Drains should not normally be laid to a radius of less than 10 times the actual width of the drain.

Invert block drains shall be constructed in the positions and to the levels and dimensions shown on the drawings and laid to true line and even fall. Where underfilling is required it shall be in 100mm maximum thickness layers of compacted gravel. The earth sides to such channels shall be neatly finished to a slope of 1 to 1 or such other slope as the Architect may direct.

Invert blocks and side slabs shall be laid on a 75mm minimum thickness of compacted gravel and be neatly jointed with cement mortar (1:3) as the work proceeds. The rates included in the Bills of Quantities shall include for excavation, gravel bedding, providing, laying and jointing invert blocks, refilling and disposal of surplus all as specified and all in-situ connections in concrete of the appropriate Grade specified.

On completion, all drains, manholes, etc. shall be flushed from end to end with water and left clean and free from obstructions and deleterious matter.

ROAD GULLIES

Gullies shall be masonry gullies constructed from 225mm building stone and rendered internally. The rates included in the Bills of Quantities shall include for excavation, provision of all materials, making junctions with connections to main drains, accurate setting of frames to line and level, refilling and disposal of surplus materials.

Concrete filled gulley grating of size shown on the drawings shall be used as the cover.

KERBS, CHANNELS AND QUADRANTS

Precast concrete kerbs channels and quadrants shall be bedded and jointed in 12mm thick cement mortar (1:3) on concrete (1:3:6 - 40mm) foundation of dimensions shown on the drawings. Immediately after being laid, the kerbs and quadrants shall be haunched on back face to half their height in concrete (1:3:6 - 40mm) to the dimensions shown on the drawings.

The exposed face of kerbs and quadrants shall be not less than 100mm nor more than 105mm above the channel of the road except where it is necessary to provide an artificial fall in the channel. The exposed surfaces of the kerbs, channels and quadrants shall conform to the required gradients and curves in vertical plane and to the required plan.

Kerbs, channels and quadrants shall conform to the requirements of B.S. 340. No joint shall exceed 12mm in width. All units shall be laid true to line and level and any unit found to be more than 3mm out of line or level at either end shall be lifted and relaid.

PRECAST CONCRETE PAVING SLABS

Unless otherwise shown on the drawings or directed, precast concrete paving slabs shall comply with B.S. 368 with minimum strength.

WEED KILLER

The finished formation of the footways and roads shall, where directed by the Architect, be sprayed with a persistent total herbicide 'Telvar' W or other equal and approved, at the rate of 4 Kg per hectare. The application shall be evenly sprayed in a high volume of water at about 100 to 200 litres per hectare.

PRECAST CONCRETE BLOCKS PAVING

Precast Concrete block paving shall be laid in sand on properly prepared and compacted sub-base as for in-situ concrete or asphalt concrete.

Blocks shall be fitted close together in a pattern approved by the Architect and boundaries shall be restrained by edge channels or kerbs before vibrating begins.

Blocks thickness and characteristic strengths shall be as measured in the Bills of Quantities.

Blocks shall be laid by hand 20 to 30mm above finished level on levelled, unconsolidated sand 50mm thick before compaction and the paving shall be compacted using a plate vibrator. Fine sand shall be brushed into the joints before and after compacting.

After compacting the surface level shall be within 5mm of the specified level and the level of any two adjacent blocks shall not differ by more than 2mm.