



TENDER DOCUMENT

FOR

PROPOSED CONSTRUCTION OF SPORTS FIELD AND

INDOOR SPORTS HALL

TENDER NO. MUST/ONT/SPORTS/14/2019-2020

CLOSING/OPENING DATE:

WEDNESDAY, 8TH APRIL, 2020

AT 10:00AM

Volume 01 of 03

SECTION I - INVITATION FOR TENDERS

Date: Tuesday, 24th March, 2020

TENDER REF. NO. MUST/ONT/SPORTS/14/2019-2020

TENDER NAME: PROPOSED CONSTRUCTION OF SPORTS FIELD AND INDOOR SPORTS HALL

- 1.1 Meru University of Science and Technology (MUST) invites sealed tenders from eligible bidders for **Proposed construction of sports field and indoor sports hall at Meru University of Science and Technology.**
- 1.2 Interested eligible bidders may obtain further information from and inspect the tender documents at **Procurement Office, Meru University of Science and Technology, Main Campus** located along **Meru – Maua Road, 15km from Meru Town** during official working hours between **8.00am and 5.00pm** Monday to Friday.
- 1.3 The tender documents may be downloaded free of charge from Meru University of Science and Technology website www.must.ac.ke or <https://tenders.go.ke>. Bidders who pick the tender documents from the Procurement Office are required to pay a non-refundable fee of **Kshs. 1,000** (Kenya Shillings One Thousand only) in cash at Meru University of Science and Technology Cash Office. Bidders who have paid are required to obtain an official receipt from the cash office at Meru University of Science and Technology. Those who download the Tender document should send an email giving the details of their firm, contact person, telephone numbers and email addresses to procurement@must.ac.ke
- 1.4 **NOTE:**
 1. **Mandatory pre-tender site visits for the tenders listed above will be held on Tuesday, 31st March 2020 from 10:00 am (Please be punctual) at Meru University of Science and Technology, Main Campus located along Meru – Maua Road, 15km from Meru Town. Tenderers are advised to make their own transport arrangement to and from the sites.**
 2. **In response to the Presidential directive on the containment and treatment protocols for COVID-19, only one representative per bidder will be allowed for the site visit and during tender opening.**
- 1.5 Completed tender documents (Original and Copy) are to be enclosed in plain sealed envelopes, marked with the tender number and name and be deposited in the Tender Box located at the reception of Administration Block 2 or be addressed to:

The Vice Chancellor,
Meru University of Science and Technology,
P.O. Box 972-60200,
Meru

so as to be received on or before Wednesday, 8th April, 2020 at 10.00 am.
- 1.6 Tenders will be opened immediately thereafter in the presence of the bidders' representatives who choose to attend at the University Multi Purpose Hall (MPH). Only one representative per bidder will be allowed during tender opening.
- 1.7 Late Tender Documents shall be rejected and returned unopened.



MERU UNIVERSITY OF SCIENCE & TECHNOLOGY
Foundation of innovations

THE PROPOSED SPORTS FACILITY
ON
PLOT L.R.NO.27425-(NCHIRU)
MERU-MAUA ROAD
MERU COUNTY
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STATEMENT
ON
BILLS OF QUANTITIES

These Bills of Quantities are supplied as part of the contract for **PROPOSED SPORTS FACILITY FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY**.

Prepared by:

QUANTI – BILL CONSULTS COMPANY LIMITED

Quantity Surveyors and Building Economists,

Suite No. 9, K.P. Offices,

Milimani Road.

P.O BOX 00100 – 34360 G.P.O

NAIROBI.

The Contract for the above mentioned works entered between **Meru University of Science and Technology** and the **Contractor**, refers to these Bills of Quantities, Working Drawings, Agreement and Schedule of Conditions and Instructions to Tenderers as adopted from PPOA for Building works, the Appendix to conditions of contract and any addendums issued, which shall be read and construed as part of the said contract.

The Contractor is required to check the numbers of the pages of these Bills of Quantities and should he find any missing, in duplicate or indistinct he must inform the Quantity Surveyor at once and have the same rectified.

Should the Contractor be in doubt about the precise meaning of any item or figure for any reason whatsoever, he must inform the Quantity Surveyor in order that the correct meaning may be decided before the date for submission of Tenders. No liability will be admitted nor claim allowed in respect of errors in the Contractors Tender due to mistakes in these Bills of Quantities, which should have been rectified in the manner, described above.

COPY RIGHT:

The Copyright of these Bills of Quantities is vested in the Quantity Surveyor and no part thereof may be reproduced without the express permission given in writing.

BILL NO. 01

**BIDDING DOCUMENT FOR
PROCUREMENT OF WORKS**

**INVITATION TO TENDER, INSTRUCTIONS TO
TENDERERS, APPENDIX TO INSTRUCTIONS TO
TENDERERS, CONDITIONS OF CONTRACT,
APPENDIX TO CONDITIONS OF CONTRACT AND
STANDARD FORMS**

BIDDING DOCUMENT FOR PROCUREMENT OF WORKS

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SECTION I:
INVITATION TO TENDER

The Invitation to tender for the Proposed Sports Fields for Meru University of Science and Technology is as per attached letter from Meru University of Science and Technology.

SECTION II

INSTRUCTIONS TO TENDERERS

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INSTRUCTIONS TO TENDERERS.

1. General/Eligibility/Qualifications/Joint venture/Cost of tendering

- 1.1 The Employer as defined in the Appendix to Conditions of Contract invites tenders for Works Contract as described in the tender documents. The successful tenderer will be expected to complete the Works by the Intended Completion Date specified in the tender documents.
- 1.2 All tenderers shall provide the Qualification Information, a statement that the tenderer (including all members of a joint venture and subcontractors) is not associated, or has not been associated in the past, directly or indirectly, with the Consultant or any other entity that has prepared the design, specifications, and other documents for the project or being proposed as Project Manager for the Contract. A firm that has been engaged by the Employer to provide consulting services for the preparation or supervision of the Works, and any of its affiliates, shall not be eligible to tender.
- 1.3 All tenderers shall provide in the Form of Tender and Qualification Information, a preliminary description of the proposed work method and schedule, including drawings and charts, as necessary.
- 1.4 In the event that pre-qualification of potential tenderers has been undertaken, only tenders from pre-qualified tenderers will be considered for award of Contract. These qualified tenderers should submit with their tenders any information updating their original pre-qualification applications or, alternatively, confirm in their tenders that the originally submitted pre-qualification information remains essentially correct as of the date of tender submission.
- 1.5 Where no pre-qualification of potential tenderers has been done, all tenderers shall include the following information and documents with their tenders , unless otherwise stated: (See appendix for required details)
 - (a) copies of original documents defining the constitution or legal status, place of registration, and principal place of business; written power of attorney of the signatory of the tender to commit the tenderer:
 - (b) total monetary value of construction work performed for each of the last five years:
 - (c) experience in works of a similar nature and size for each of the last five years, and details of work under way or contractually committed; and names and addresses of clients who may be contacted for further information on these contracts;

- (d) major items of construction equipment proposed to carry out the Contract and an undertaking that they will be available for the Contract.
- (e) qualifications and experience of key site management and technical personnel proposed for the Contract and an undertaking that they shall be available for the Contract.
- (f) reports on the financial standing of the tenderer, such as profit and loss statements and auditor's reports for the past three years;
- (g) evidence of adequacy of working capital for this Contract (access to line(s) of credit and availability of other financial resources);
- (h) authority to seek references from the tenderer's bankers;
- (i) information regarding any litigation, current or during the last five years, in which the tenderer is involved, the parties concerned and disputed amount; and
- (j) proposals for subcontracting components of the Works amounting to more than 10 percent of the Contract Price.

1.6 Tenders submitted by a joint venture of two or more firms as partners shall comply with the following requirements, unless otherwise stated:

- (a) the tender shall include all the information listed in clause 1.5 above for each joint venture partner;
- (b) the tender shall be signed so as to be legally binding on all partners;
- (c) all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms;
- (d) one of the partners will be nominated as being in charge, authorised to incur liabilities, and receive instructions for and on behalf of all partners of the joint venture; and
- (e) the execution of the entire Contract, including payment, shall be done exclusively with the partner in charge.

1.7 To qualify for award of the Contract, tenderers shall meet the following minimum qualifying criteria;

- (a) annual volume of construction work of at least 2.5 times the estimated annual cashflow for the Contract;

- (b) experience as main contractor in the construction of at least two works of a nature and complexity equivalent to the Works over the last 10 years (to comply with this requirement, works cited should be at least 70 percent complete);
 - (c) proposals for the timely acquisition (own, lease, hire, etc.) of the essential equipment listed as required for the Works;
 - (d) a Contract manager with at least five years' experience in works of an equivalent nature and volume, including no less than three years as Manager; and
 - (e) liquid assets and/or credit facilities, net of other contractual commitments and exclusive of any advance payments which may be made under the Contract, of no less than 4 months of the estimated payment flow under this Contract.
- 1.8 The figures for each of the partners of a joint venture shall be added together to determine the tenderer's compliance with the minimum qualifying criteria of clause 1.7 (a) and (e); however, for a joint venture to qualify, each of its partners must meet at least 25 percent of minimum criteria 1.7 (a), (b) and (e) for an individual tenderer, and the partner in charge at least 40 percent of those minimum criteria. Failure to comply with this requirement will result in rejection of the joint venture's tender. Subcontractors' experience and resources will not be taken into account in determining the tenderer's compliance with the qualifying criteria, unless otherwise stated.
- 1.9 Each tenderer shall submit only one tender, either individually or as a partner in a joint venture. A tenderer who submits or participates in more than one tender (other than as a subcontractor or in cases of alternatives that have been permitted or requested) will cause all the proposals with the tenderer's participation to be disqualified.
- 1.10 The tenderer shall bear all costs associated with the preparation and submission of his tender, and the Employer will in no case be responsible or liable for those costs.
- 1.11 The tenderer, at the tenderer's own responsibility and risk, is encouraged to visit and examine the Site of the Works and its surroundings, and obtain all information that may be necessary for preparing the tender and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the tenderer's own expense.
- 1.12 The procuring entity's employees, committee members, board members and their relative (spouse and children) are not eligible to participate in the tender.

- 1.13 The price to be charged for purchasing of the tender document shall be Kshs.1,000/=. The bid document may also be downloaded FREE OF CHARGE from:
The university website www.must.ac.ke or,
Kenya Government tenders portal:<http://www.supplier.treasury.go.ke>
or,
Downloads from <http://supplier>.
- 1.14 The procuring entity shall allow the tenderer to review the tender document free of charge before purchase.

2. Tender Documents.

- 2.1 The complete set of tender documents comprises the documents listed below and any addenda issued in accordance with Clause 2.4.
- (a) These Instructions to Tenderers
 - (b) Form of Tender and Qualification Information
 - (c) Conditions of Contract
 - (d) Appendix to Conditions of Contract
 - (e) Specifications
 - (f) Drawings
 - (g) Bills of Quantities
 - (h) Forms of Securities
- 2.2 The tenderer shall examine all Instructions, Forms to be filled and Specifications in the tender documents. Failure to furnish all information required by the tender documents, or submission of a tender not substantially responsive to the tendering documents in every respect will be at the tenderer's risk and may result in rejection of his tender.
- 2.3 A prospective tenderer making an inquiry relating to the tender documents may notify the Employer in writing or by cable, telex or facsimile at the address indicated in the letter of invitation to tender. The Employer will only respond to requests for clarification received earlier than seven days prior to the deadline for submission of tenders. Copies of the Employer's response will be forwarded to all persons issued with tendering documents, including a description of the inquiry, but without identifying its source.
- 2.4 Before the deadline for submission of tenders, the Employer may modify the tendering documents by issuing addenda. Any addendum thus issued shall be part of the tendering documents and shall be communicated in writing or by cable, telex or facsimile to all tenderers. Prospective tenderers shall acknowledge receipt of each addendum in writing to the Employer.
- 2.5 To give prospective tenderers reasonable time in which to take an addendum into account in preparing their tenders, the Employer shall

extend, as necessary, the deadline for submission of tenders, in accordance with Clause 4.2 here below.

3. Preparation of Tenders

- 3.1 All documents relating to the tender and any correspondence shall be in English language.
- 3.2 The tender submitted by the tenderer shall comprise the following:
 - (a) These Instructions to Tenderers, Form of Tender, Conditions of Contract, Appendix to Conditions of Contract and Specifications;
 - (b) Tender Security;
 - (c) Priced Bill of Quantities ;
 - (d) Qualification Information Form and Documents;
 - (e) Alternative offers where invited; and
 - (f) Any other materials required to be completed and submitted by the tenderers.
- 3.3 The tenderer shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items for which no rate or price is entered by the tenderer will not be paid for when executed and shall be deemed covered by the other rates and prices in the Bill of Quantities. All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause relevant to the Contract, as of 30 days prior to the deadline for submission of tenders, shall be included in the tender price submitted by the tenderer.
- 3.4 The rates and prices quoted by the tenderer shall only be subject to adjustment during the performance of the Contract if provided for in the Appendix to Conditions of Contract and provisions made in the Conditions of Contract.
- 3.5 The unit rates and prices shall be in Kenya Shillings.
- 3.6 Tenders shall remain valid for a period of one hundred and twenty (120) days from the date of submission. However in exceptional circumstances, the Employer may request that the tenderers extend the period of validity for a specified additional period. The request

and the tenderers' responses shall be made in writing. A tenderer may refuse the request without forfeiting the Tender Security. A tenderer agreeing to the request will not be required or permitted to otherwise modify the tender, but will be required to extend the validity of Tender Security for the period of the extension, and in compliance with Clause 3.7 - 3.11 in all respects.

- 3.7 The tenderer shall furnish, as part of the tender, a Tender Security in the amount and form specified in the appendix to instructions to tenderers. This shall be in the amount not exceeding 2 percent of the tender price
- 3.8 The format of the Tender Security should be in accordance with the form of Tender Security included in Section VIII - Standard forms or any other form acceptable to the Employer. Tender Security shall be valid for 30 days beyond the validity of the tender.
- 3.9 Any tender not accompanied by an acceptable Tender Security shall be rejected. The Tender Security of a joint venture must define as "Tenderer" all joint venture partners and list them in the following manner: a joint venture consisting of".....", ".....", and ".....".
- 3.10 The Tender Securities of unsuccessful tenderers will be returned within 28 days of the end of the tender validity period specified in Clause 3.6.
- 3.11 The Tender Security of the successful tenderer will be discharged when the tenderer has signed the Contract Agreement and furnished the required Performance Security.
- 3.12 The Tender Security may be forfeited
 - (a) if the tenderer withdraws the tender after tender opening during the period of tender validity;
 - (b) if the tenderer does not accept the correction of the tender price, pursuant to Clause 5.7;
 - (c) in the case of a successful tenderer, if the tenderer fails within the specified time limit to
 - (i) Sign the Agreement, or
 - (ii) Furnish the required Performance Security.
- 3.13 Tenderers shall submit offers that comply with the requirements of the tendering documents, including the basic technical design as indicated in the Drawings and Specifications. Alternatives will not be considered, unless specifically allowed in the invitation to tender. If

so allowed, tenderers wishing to offer technical alternatives to the requirements of the tendering documents must also submit a tender that complies with the requirements of the tendering documents, including the basic technical design as indicated in the Drawings and Specifications. In addition to submitting the basic tender, the tenderer shall provide all information necessary for a complete evaluation of the alternative, including design calculations, technical specifications, breakdown of prices, proposed construction methods and other relevant details. Only the technical alternatives, if any, of the lowest evaluated tender conforming to the basic technical requirements shall be considered.

- 3.14 The tenderer shall prepare one original of the documents comprising the tender documents as described in Clause 3.2 of these Instructions to Tenderers, bound with the volume containing the Form of Tender, and clearly marked "ORIGINAL". In addition, the tenderer shall submit copies of the tender, in the number specified in the invitation to tender, and clearly marked as "COPIES". In the event of discrepancy between them, the original shall prevail.
- 3.15 The original and all copies of the tender shall be typed or written in indelible ink and shall be signed by a person or persons duly authorised to sign on behalf of the tenderer, pursuant to Clause 1.5 (a) or 1.6 (b), as the case may be. All pages of the tender where alterations or additions have been made shall be initialled by the person or persons signing the tender.
- 3.16 Clarification of tenders shall be requested by the tenderer to be received by the procuring entity not later than 7 days prior to the deadline for submission of tenders.
- 3.17 The procuring entity shall reply to any clarifications sought by the tenderer within 3 days of receiving the request to enable the tenderer to make timely submission of its tender.
- 3.18 The tender security shall be in the amount of 0.5 – 2 per cent of the tender price. (See appendix to Instructions to tenderers)

4. Submission of Tenders

- 4.1 The tenderer shall seal the original and all copies of the tender in two inner envelopes and one outer envelope, duly marking the inner envelopes as "**ORIGINAL**" and "**COPIES**" as appropriate. The inner and outer envelopes shall:
 - (a) be addressed to the Employer at the address provided in the invitation to tender;
 - (b) bear the name and identification number of the Contract as defined in the invitation to tender; and

- (c) provide a warning not to open before the specified time and date for tender opening.
- 4.2 Tenders shall be delivered to the Employer at the address specified above not later than the time and date specified in the invitation to tender. However, the Employer may extend the deadline for submission of tenders by issuing an amendment in accordance with Sub-Clause 2.5 in which case all rights and obligations of the Employer and the tenderers previously subject to the original deadline will then be subject to the new deadline.
- 4.3 Any tender received after the deadline prescribed in clause 4.2 will be returned to the tenderer un-opened.
- 4.4 Tenderers may modify or withdraw their tenders by giving notice in writing before the deadline prescribed in clause 4.2. Each tenderer's modification or withdrawal notice shall be prepared, sealed, marked, and delivered in accordance with clause 3.13 and 4.1, with the outer and inner envelopes additionally marked "**MODIFICATION**" and "**WITHDRAWAL**", as appropriate. No tender may be modified after the deadline for submission of tenders.
- 4.5 Withdrawal of a tender between the deadline for submission of tenders and the expiration of the period of tender validity specified in the invitation to tender or as extended pursuant to Clause 3.6 may result in the forfeiture of the Tender Security pursuant to Clause 3.11.
- 4.6 Tenderers may only offer discounts to, or otherwise modify the prices of their tenders by submitting tender modifications in accordance with Clause 4.4 or be included in the original tender submission.

5. Tender Opening and Evaluation

- 5.1 The tenders will be opened by the Employer, including modifications made pursuant to Clause 4.4, in the presence of the tenderers' representatives who choose to attend at the time and in the place specified in the invitation to tender. Envelopes marked "**WITHDRAWAL**" shall be opened and read out first. Tenderers' and Employer's representatives who are present during the opening shall sign a register evidencing their attendance.
- 5.2 The tenderers' names, the tender prices, the total amount of each tender and of any alternative tender (if alternatives have been requested or permitted), any discounts, tender modifications and withdrawals, the presence or absence of Tender Security, and such other details as may be considered appropriate, will be announced by the Employer at the opening. Minutes of the tender opening,

including the information disclosed to those present will be prepared by the Employer.

- 5.3 Information relating to the examination, clarification, evaluation, and comparison of tenders and recommendations for the award of Contract shall not be disclosed to tenderers or any other persons not officially concerned with such process until the award to the successful tenderer has been announced. Any effort by a tenderer to influence the Employer's officials, processing of tenders or award decisions may result in the rejection of his tender.
- 5.4 To assist in the examination, evaluation, and comparison of tenders, the Employer at his discretion, may ask any tenderer for clarification of the tender, including breakdowns of unit rates. The request for clarification and the response shall be in writing or by cable, telex or facsimile but no change in the price or substance of the tender shall be sought, offered, or permitted except as required to confirm the correction of arithmetic errors discovered in the evaluation of the tenders in accordance with Clause 5.7.
- 5.5 Prior to the detailed evaluation of tenders, the Employer will determine whether each tender (a) meets the eligibility criteria defined in Clause 1.7; and as mandatory requirements in the Appendix to Conditions of Contract Tender Evaluation Criteria; (b) has been properly signed; (c) is accompanied by the required securities; and (d) is substantially responsive to the requirements of the tendering documents. A substantially responsive tender is one which conforms to all the terms, conditions and specifications of the tendering documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality, or performance of the works; (b) which limits in any substantial way, inconsistent with the tendering documents, the Employer's rights or the tenderer's obligations under the Contract; or (c) whose rectification would affect unfairly the competitive position of other tenderers presenting substantially responsive tenders.
- 5.6 If a tender is not substantially responsive, it will be rejected, and may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation or reservation.
- 5.7 Tender figure as announced at the tender opening shall not be subject to any arithmetic error correction as per section 82 of the Public Procurement and Disposal Act 2015.

- 5.8 The Employer reserves the right to accept or reject any variation, deviation, or alternative offer. Variations, deviations, and alternative offers and other factors which are in excess of the requirements of the tender documents or otherwise result in unsolicited benefits for the Employer will not be taken into account in tender evaluation.
- 5.9 The tenderer shall not influence the Employer on any matter relating to his tender from the time of the tender opening to the time the Contract is awarded. Any effort by the Tenderer to influence the Employer or his employees in his decision on tender evaluation, tender comparison or Contract award may result in the rejection of the tender.
- 5.10 Firms incorporated in Kenya where indigenous Kenyans own 51% or more of the share capital shall be allowed a 10% preferential bias provided that they do not sub-contract work valued at more than 50% of the Contract Price excluding Provisional Sums to a non-indigenous sub-contractor.

6. Award of Contract

- 6.1 Subject to Clause 6.2, the award of the Contract will be made to the tenderer whose tender has been determined to be substantially responsive to the tendering documents and who has offered the lowest evaluated tender price, provided that such tenderer has been determined to be (a) eligible in accordance with the provision of Clauses 1.2, and (b) qualified in accordance with the provisions of clause 1.7 and 1.8.
- 6.2 Notwithstanding clause 6.1 above, the Employer reserves the right to accept or reject any tender, and to cancel the tendering process and reject all tenders, at any time prior to the award of Contract, without thereby incurring any liability to the affected tenderer or tenderers or any obligation to inform the affected tenderer or tenderers of the grounds for the action.
- 6.3 The tenderer whose tender has been accepted will be notified of the award prior to expiration of the tender validity period in writing or by cable, telex or facsimile. This notification (hereinafter and in all Contract documents called the "Letter of Acceptance") will state the sum (hereinafter and in all Contract documents called the "Contract Price") that the Employer will pay the Contractor in consideration of the execution, completion, and maintenance of the Works by the Contractor as prescribed by the Contract. At the same time the other tenderers shall be informed that their tenders have not been successful.
- The contract shall be formed on the parties signing the contract.
- 6.4 The Agreement will incorporate all agreements between the Employer and the successful tenderer. Within 14 days of receipt the successful tenderer will sign the Agreement and return it to the Employer.
- 6.5 Within 21 days after receipt of the Letter of Acceptance, the successful tenderer shall deliver to the Employer a Performance Security in the amount stipulated in the Appendix to Conditions of Contract and in the form stipulated in the Tender documents. The Performance Security shall be in the amount and specified form
- 6.6 Failure of the successful tenderer to comply with the requirements of clause 6.5 shall constitute sufficient grounds for cancellation of the award and forfeiture of the Tender Security.

- 6.7 Upon the furnishing by the successful tenderer of the Performance Security, the Employer will promptly notify the other tenderers that their tenders have been unsuccessful.
- 6.8 Preference where allowed in the evaluation of tenders shall not be allowed for contracts not exceeding one year (12 months)
- 6.9 The tender evaluation committee shall evaluate the tender within 30 days of the validity period from the date of opening the tender.
- 6.10 The parties to the contract shall have it signed within 30 days from the date of notification of contract award unless there is an administrative review request.
- 6.11 Contract price variations shall not be allowed for contracts not exceeding one year (12 months) (See appendix)
- 6.12 Where contract price variation is allowed, the valuation shall not exceed 15% of the original contract price.
- 6.13 Price variation request shall be processed by the procuring entity within 30 days of receiving the request.
- 6.14 The procuring entity may at any time terminate procurement proceedings before contract award and shall not be liable to any person for the termination.
- 6.15 The procuring entity shall give prompt notice of the termination to the tenderers and on request give its reasons for termination within 14 days of receiving the request from any tenderer.
- 6.16 A tenderer who gives false information in the tender document about its qualification or who refuses to enter into a contract after notification of contract award shall be considered for debarment from participating in future public procurement.

7. Corrupt and Fraudulent practices

- 7.1 The procuring entity requires that tenderers observe the highest standards of ethics during procurement process and execution of contracts. A tenderer shall sign a declaration that he has not and will not be involved in corrupt and fraudulent practices.

8. Phasing of works.

The employer reserves the right to phase works either in terms of number of fields, elements or units phasing. The tenderer must make all necessary allowance and provision in his tender in connection therewith and no claim will be entertained

should the Employer exercise this option. This option may be exercise either before or after award of tender and the tender sum or contract sum adjusted accordingly without reference to the tenderer.

In the event that any phasing is exercised, the works shall be measured and priced at the contract rates as priced at tender. The decision regarding any phasing of the works will be communicated to the contractor as soon as practicable either before or after signing the contract. An appropriate extension of time will however be granted by the Project Manager if the decision is unduly delayed and in his opinion it will adversely affect the contractor’s programme.

The pricing of preliminaries, general conditions and measured works will be deemed to have taken into account and to include any cost component that the contractor wishes and of which no mention has been made herein as no additional cost will be paid consequent to any adjustment made in respect of the phasing of works.

SECTION III: APPENDIX TO INSTRUCTIONS TO TENDERERS

The following information regarding the particulars of the tender shall complement, supplement or amend the provisions of the instructions to tenderers. Wherever there is a conflict between the provision of the instructions to tenderers and the provisions of the appendix, the provisions of the appendix herein shall prevail over those of the instructions to tenderers

TENDER DATA SHEET.

No	Particulars of appendix to the Instruction to Tenderers
1	The Procuring Entity is Meru University of Science and Technology
2	Name of Project is Proposed Construction Of Sports Field And Indoor Sports Hall.
3	Tender number: MUST/ONT/SPORTS/14/2019-2020
4	The expected completion date of the works is to be agreed by the project manager
5	Alternative Tenders are “not allowed “in this Tender
6	Alternative time for completion is not applicable
7	This tender is open to Only Tenderers registered as a CONTRACTOR by the NATIONAL CONSTRUCTION AUTHORITY N.C.A 3 AND ABOVE

8	Pre-Tender site visit shall be held and will be mandatory.
9	Tenderers shall submit original tender document and a copy.
10	Address for clarification of Tendering Document is The Vice Chancellor, Meru University of Science and Technology, P.O BOX 972-60200, Meru.
11	Tenderers may seek tender clarification seven days before closing date of the tender
12	Language of Tender and all correspondence shall be in ENGLISH LANGUAGE.
13	Tenderers shall meet all the minimum qualification requirements as set below in the evaluation criteria
14	The price shall be fixed and shall remain as indicated in the form of tender. The tender figure read out at tender opening shall NOT be changed under whatever circumstances.
15	The currency in which the prices shall be quoted shall be: Kenyan Shillings
16	The authority for establishing the rates of exchange shall be Central Bank of Kenya at the rate prevailing on the tender closing day.
17	The Tender validity period shall be 120 days.
18	Tender Security shall be Kshs. 5,000,000.00/=
19	Tenders shall be addressed and submitted to; The Vice Chancellor, Meru University of Science and Technology. P.O BOX 972-60200, Meru. So as to be received on or before as per letter of invitation to tender
20	The Tender opening shall take place at: as per letter of invitation to tender

SECTION IV: CONDITIONS OF CONTRACT

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CONDITIONS OF CONTRACT

1. Definitions

1.1 In this Contract, except where context otherwise requires, the following terms shall be interpreted as indicated;

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

“Compensation Events” are those defined in Clause 24 hereunder.

“The Completion Date” means the date of completion of the Works as certified by the Project Manager, in accordance with Clause 31.

“The Contract” means the agreement entered into between the Employer and the Contractor as recorded in the Agreement Form and signed by the parties including all attachments and appendices thereto and all documents incorporated by reference therein to execute, complete, and maintain the Works,

“The Contractor” refers to the person or corporate body whose tender to carry out the Works has been accepted by the Employer.

“The Contractor’s Tender” is the completed tendering document submitted by the Contractor to the Employer.

“The Contract Price” is the price stated in the Letter of Acceptance and thereafter as adjusted in accordance with the provisions of the Contract.

“Days” are calendar days; **“Months”** are calendar months.

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

“The Defects Liability Certificate” is the certificate issued by Project Manager upon correction of defects by the Contractor.

“The Defects Liability Period” is the period named in the Contract Data and calculated from the Completion Date.

“Drawings” include calculations and other information provided or approved by the Project Manager for the execution of the Contract.

“Dayworks” are Work inputs subject to payment on a time basis for labour and the associated materials and plant.

“Employer”, or the **“Procuring entity”** as defined in the Public Procurement Regulations (i.e. Central or Local Government administration, Universities, Public Institutions and Corporations, etc) is the party who employs the Contractor to carry out the Works.

“Equipment” is the Contractor’s machinery and vehicles brought temporarily to the Site for the execution of the Works.

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

“Materials” are all supplies, including consumables, used by the Contractor for incorporation in the Works.

“Plant” is any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function.

“Project Manager” is the person named in the Appendix to Conditions of Contract (or any other competent person appointed by the Employer and notified to the Contractor, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract and shall be an “Architect” or a “Quantity Surveyor” registered under the Architects and Quantity Surveyors Act Cap 525 or an “Engineer” registered under Engineers Registration Act Cap 530.

“Site” is the area defined as such in the Appendix to Condition of Contract.

“Site Investigation Reports” are those reports that may be included in the tendering documents which are factual and interpretative about the surface and subsurface conditions at the Site.

“Specifications” means the Specifications of the Works included in the Contract and any modification or addition made or approved by the Project Manager.

“Start Date” is the latest date when the Contractor shall commence execution of the Works. It does not necessarily coincide with the Site possession date(s).

“A Subcontractor” is a person or corporate body who has a Contract with the Contractor to carry out a part of the Work in the Contract, which includes Work on the Site.

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

“A Variation” is an instruction given by the Project Manager which varies the Works.

“The Works” are what the Contract requires the Contractor to construct, install, and turnover to the Employer, as defined in the Appendix to Conditions of Contract.

2. Interpretation

2.1 In interpreting these Conditions of Contract, singular also means plural, male also means female or neuter, and the other way around. Headings have no significance. Words have their normal meaning in English Language unless specifically defined. The Project Manager will provide instructions clarifying queries about these Conditions of Contract.

2.2 If sectional completion is specified in the Appendix to Conditions of Contract, reference in the Conditions of Contract to the Works, the Completion Date and the Intended Completion Date apply to any section of the Works (other than references to the Intended Completion Date for the whole of the Works).

2.3 The following documents shall constitute the Contract documents and shall be interpreted in the following order of priority;

- (1) Agreement,
- (2) Letter of Acceptance,
- (3) Contractor’s Tender,
- (4) Appendix to Conditions of Contract,
- (5) Conditions of Contract,
- (6) Specifications,
- (7) Drawings,
- (8) Bill of Quantities,
- (9) Any other documents listed in the Appendix to Conditions of Contract as forming part of the Contract.

Immediately after the execution of the Contract, the Project Manager shall furnish both the Employer and the Contractor with two copies

each of all the Contract documents. Further, as and when necessary the Project Manager shall furnish the Contractor [always with a copy to the Employer] with three [3] copies of such further drawings or details or descriptive schedules as are reasonably necessary either to explain or amplify the Contract drawings or to enable the Contractor to carry out and complete the Works in accordance with these Conditions.

3. Language and Law

3.1 Language of the Contract and the law governing the Contract shall be English language and the Laws of Kenya respectively unless otherwise stated.

4 Project Manager's Decisions

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

5 Delegation

5.1 The Project Manager may delegate any of his duties and responsibilities to others after notifying the Contractor.

6 Communications

6.1 Communication between parties shall be effective only when in writing. A notice shall be effective only when it is delivered.

7 Subcontracting

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

8 Other Contractors

8.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities etc. as listed in the Appendix to Conditions of Contract and also with the Employer, as per the directions of the Project Manager. The Contractor shall also provide facilities and services for them. The Employer may modify the said List of Other Contractors etc., and shall notify the Contractor of any such modification.

9 Personnel

- 9.1 The Contractor shall employ the key personnel named in the Qualification Information, to carry out the functions stated in the said Information or other personnel approved by the Project Manager. The Project Manager will approve any proposed replacement of key personnel only if their relevant qualifications and abilities are substantially equal to or better than those of the personnel listed in the Qualification Information. If the Project Manager asks the Contractor to remove a person who is a member of the Contractor's staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the Work in the Contract.

10 Works

- 10.1 The Contractor shall construct and install the Works in accordance with the Specifications and Drawings. The Works may commence on the Start Date and shall be carried out in accordance with the Program submitted by the Contractor, as updated with the approval of the Project Manager, and complete them by the Intended Completion Date.

11 Safety and Temporary Works

- 11.1 The Contractor shall be responsible for the design of temporary works. However before erecting the same, he shall submit his designs including specifications and drawings to the Project Manager and to any other relevant third parties for their approval. No erection of temporary works shall be done until such approvals are obtained.
- 11.2 The Project Manager's approval shall not alter the Contractor's responsibility for design of the Temporary works and all drawings prepared by the Contractor for the execution of the temporary or permanent Works, shall be subject to prior approval by the Project Manager before they can be used.
- 11.3 The Contractor shall be responsible for the safety of all activities on the Site.

12. Discoveries

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

13. Work Program

13.1 Within the time stated in the Appendix to Conditions of Contract, the Contractor shall submit to the Project Manager for approval a program showing the general methods, arrangements, order, and timing for all the activities in the Works. An update of the program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining Work, including any changes to the sequence of the activities.

The Contractor shall submit to the Project Manager for approval an updated program at intervals no longer than the period stated in the Appendix to Conditions of Contract. If the Contractor does not submit an updated program within this period, the Project Manager may withhold the amount stated in the said Appendix from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue program has been submitted. The Project Manager's approval of the program shall not alter the Contractor's obligations. The Contractor may revise the program and submit it to the Project Manager again at any time. A revised program shall show the effect of Variations and Compensation Events.

14. Possession of Site

14.1 The Employer shall give possession of all parts of the Site to the Contractor. If possession of a part is not given by the date stated in the Appendix to Conditions of Contract, the Employer will be deemed to have delayed the start of the relevant activities, and this will be a Compensation Event.

15. Access to Site

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

16. Instructions

16.1 The Contractor shall carry out all instructions of the Project Manager which are in accordance with the Contract.

17. Extension or Acceleration of Completion Date

17.1 The Project Manager shall extend the Intended Completion Date if a Compensation Event occurs or a variation is issued which makes it impossible for completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining

Work, which would cause the Contractor to incur additional cost. The Project Manager shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Project Manager in writing for a decision upon the effect of a Compensation Event or variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay caused by such failure shall not be considered in assessing the new (extended) Completion Date.

17.2 No bonus for early completion of the Works shall be paid to the Contractor by the Employer.

18. Management Meetings

18.1 A Contract management meeting shall be held monthly and attended by the Project Manager and the Contractor. Its business shall be to review the plans for the remaining Work and to deal with matters raised in accordance with the early warning procedure. The Project Manager shall record the minutes of management meetings and provide copies of the same to those attending the meeting and the Employer. The responsibility of the parties for actions to be taken shall be decided by the Project Manager either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

19. Early Warning

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

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

20. Defects

20.1 The Project Manager shall inspect the Contractor's work and notify the Contractor of any defects that are found. Such inspection shall not affect the Contractor's responsibilities. The Project Manager may instruct the Contractor to search for a defect and to uncover and test

any Work that the Project Manager considers may have a defect. Should the defect be found, the cost of uncovering and making good shall be borne by the Contractor, However, if there is no defect found, the cost of uncovering and making good shall be treated as a variation and added to the Contract Price.

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

20.3 Every time notice of a defect is given, the Contractor shall correct the notified defect within the length of time specified by the Project Manager's notice. If the Contractor has not corrected a defect within the time specified in the Project Manager's notice, the Project Manager will assess the cost of having the defect corrected by other parties and such cost shall be treated as a variation and be deducted from the Contract Price.

21. Bills Of Quantities

21.1 The Bills of Quantities shall contain items for the construction, installation, testing and commissioning of the Work to be done by the Contractor. The Contractor will be paid for the quantity of the Work done at the rate in the Bills of Quantities for each item.

21.2 If the final quantity of the Work done differs from the quantity in the Bills of Quantities for the particular item by more than 25 percent and provided the change exceeds 1 percent of the Initial Contract price, the Project Manager shall adjust the rate to allow for the change.

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

22. Variations

22.1 All variations shall be included in updated programs produced by the Contractor.

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

- 22.3 If the work in the variation corresponds with an item description in the Bills of Quantities and if in the opinion of the Project Manager, the quantity of work is not above the limit stated in Clause 21.2 or the timing of its execution does not cause the cost per unit of quantity to change, the rate in the Bills of Quantities shall be used to calculate the value of the variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the variation does not correspond with items in the Bills of Quantities, the quotation by the Contractor shall be in the form of new rates for the relevant items of Work.
- 22.4 If the Contractor's quotation is unreasonable, the Project Manager may order the variation and make a change to the Contract price, which shall be based on the Project Manager's own forecast of the effects of the variation on the Contractor's costs.
- 22.5 If the Project Manager decides that the urgency of varying the Work would prevent a quotation being given and considered without delaying the Work, no quotation shall be given and the variation shall be treated as a Compensation Event.
- 22.6 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning.
- 22.7 When the Program is updated, the Contractor shall provide the Project Manager with an updated cash flow forecast.

23. Payment Certificates, Currency of Payments and Advance Payments

- 23.1 The Contractor shall submit to the Project Manager monthly applications for payment giving sufficient details of the Work done and materials on Site and the amounts which the Contractor considers himself to be entitled to. The Project Manager shall check the monthly application and certify the amount to be paid to the Contractor within 14 days. The value of Work executed and payable shall be determined by the Project Manager.
- 23.2 The value of Work executed shall comprise the value of the quantities of the items in the Bills of Quantities completed, materials delivered on Site, variations and compensation events. Such materials shall become the property of the Employer once the Employer has paid the Contractor for their value. Thereafter, they shall not be removed from Site without the Project Manager's instructions except for use upon the Works.
- 23.3 Payments shall be adjusted for deductions for retention. The Employer shall pay the Contractor the amounts certified by the Project Manager within 30 days of the date of issue of each certificate. If the Employer makes a late payment, the Contractor shall be paid simple interest on the late payment in the next payment. Interest

shall be calculated on the basis of number of days delayed at a rate three percentage points above the Central Bank of Kenya's average rate for base lending prevailing as of the first day the payment becomes overdue.

- 23.4 If an amount certified is increased in a later certificate or as a result of an award by an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.
- 23.5 Items of the Works for which no rate or price has been entered in will not be paid for by the Employer and shall be deemed covered by other rates and prices in the Contract.
- 23.6 The Contract Price shall be stated in Kenya Shillings. All payments to the Contractor shall be made in Kenya Shillings and foreign currency in the proportion indicated in the tender, or agreed prior to the execution of the Contract Agreement and indicated therein. The rate of exchange for the calculation of the amount of foreign currency payment shall be the rate of exchange indicated in the Appendix to Conditions of Contract. If the Contractor indicated foreign currencies for payment other than the currencies of the countries of origin of related goods and services the Employer reserves the right to pay the equivalent at the time of payment in the currencies of the countries of such goods and services. The Employer and the Project Manager shall be notified promptly by the Contractor of any changes in the expected foreign currency requirements of the Contractor during the execution of the Works as indicated in the Schedule of Foreign Currency Requirements and the foreign and local currency portions of the balance of the Contract Price shall then be amended by agreement between Employer and the Contractor in order to reflect appropriately such changes.
- 23.7 In the event that an advance payment is granted, the following shall apply:-
- a) On signature of the Contract, the Contractor shall at his request, and without furnishing proof of expenditure, be entitled to an advance of 10% (ten percent) of the original amount of the Contract. The advance shall not be subject to retention money.
 - b) No advance payment may be made before the Contractor has submitted proof of the establishment of deposit or a directly liable guarantee satisfactory to the Employer in the amount of the advance payment. The guarantee shall be in the same currency as the advance.

- c) Reimbursement of the lump sum advance shall be made by deductions from the Interim payments and where applicable from the balance owing to the Contractor. Reimbursement shall begin when the amount of the sums due under the Contract reaches 20% of the original amount of the Contract. It shall have been completed by the time 80% of this amount is reached.

The amount to be repaid by way of successive deductions shall be calculated by means of the formula:

$$R = \frac{A(x^1 - x^{11})}{80 - 20}$$

Where:

- R = the amount to be reimbursed
 - A = the amount of the advance which has been granted
 - X¹ = the amount of proposed cumulative payments as a percentage of the original amount of the Contract. This figure will exceed 20% but not exceed 80%.
 - X¹¹ = the amount of the previous cumulative payments as a percentage of the original amount of the Contract. This figure will be below 80%but not less than 20%.
- d) with each reimbursement the counterpart of the directly liable guarantee may be reduced accordingly.

24. Compensation Events

24.1 The following issues shall constitute Compensation Events:

- (a) The Employer does not give access to a part of the Site by the Site Possession Date stated in the Appendix to Conditions of Contract.
- (b) The Employer modifies the List of Other Contractors, etc., in a way that affects the Work of the Contractor under the Contract.
- (c) The Project Manager orders a delay or does not issue drawings, specifications or instructions required for execution of the Works on time.
- (d) The Project Manager instructs the Contractor to uncover or to carry out additional tests upon the Work, which is then found to have no defects.

- (e) The Project Manager unreasonably does not approve a subcontract to be let.
- (f) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of the Letter of Acceptance from the information issued to tenderers (including the Site investigation reports), from information available publicly and from a visual inspection of the Site.
- (g) The Project Manager gives an instruction for dealing with an unforeseen condition, caused by the Employer or additional work required for safety or other reasons.
- (h) Other contractors, public authorities, utilities, or the Employer does not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.
- (i) The effects on the Contractor of any of the Employer's risks.
- (j) The Project Manager unreasonably delays issuing a Certificate of Completion.
- (k) Other compensation events described in the Contract or determined by the Project Manager shall apply.

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

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

24.4 The Contractor shall not be entitled to compensation to the extent that the Employer's interests are adversely affected by the Contractor not having given early warning or not having co-operated with the Project Manager.

24.5 Prices shall be adjusted for fluctuations in the cost of inputs only if provided for in the Appendix to Conditions of Contract.

24.6 The Contractor shall give written notice to the Project Manager of his intention to make a claim within thirty days after the event giving rise to the claim has first arisen. The claim shall be submitted within thirty days thereafter.

Provided always that should the event giving rise to the claim of continuing effect, the Contractor shall submit an interim claim within the said thirty days and a final claim within thirty days of the end of the event giving rise to the claim.

25. Price Adjustment

25.1 The Project Manager shall adjust the Contract Price if taxes, duties and other levies are changed between the date 30 days before the submission of tenders for the Contract and the date of Completion. The adjustment shall be the change in the amount of tax payable by the Contractor.

25.2 The Contract Price shall be deemed to be based on exchange rates current at the date of tender submission in calculating the cost to the Contractor of materials to be specifically imported (by express provisions in the Contract Bills of Quantities or Specifications) for permanent incorporation in the Works. Unless otherwise stated in the Contract, if at any time during the period of the Contract exchange rates shall be varied and this shall affect the cost to the Contractor of such materials, then the Project Manager shall assess the net difference in the cost of such materials. Any amount from time to time so assessed shall be added to or deducted from the Contract Price, as the case may be.

25.3 Unless otherwise stated in the Contract, the Contract Price shall be deemed to have been calculated in the manner set out below and in sub-clauses 25.4 and 25.5 and shall be subject to adjustment in the events specified thereunder;

(i) The prices contained in the Contract Bills of Quantities shall be deemed to be based upon the rates of wages and other emoluments and expenses as determined by the Joint Building Council of Kenya (J.B.C.) and set out in the schedule of basic rates issued 30 days before the date for submission of tenders. A copy of the schedule used by the Contractor in his pricing shall be attached in the Appendix to Conditions of Contract.

(ii) Upon J.B.C. determining that any of the said rates of wages or other emoluments and expenses are increased or decreased, then the Contract Price shall be increased or decreased by the amount assessed by the Project Manager based upon the difference, expressed as a percentage, between the rate set out in the schedule of basic rates issued 30 days before the date for submission of tenders and the rate published by the J.B.C. and

applied to the quantum of labour incorporated within the amount of Work remaining to be executed at the date of publication of such increase or decrease.

- (iii) No adjustment shall be made in respect of changes in the rates of wages and other emoluments and expenses which occur after the date of Completion except during such other period as may be granted as an extension of time under clause 17.0 of these Conditions.

25.4 The prices contained in the Contract Bills of Quantities shall be deemed to be based upon the basic prices of materials to be permanently incorporated in the Works as determined by the J.B.C. and set out in the schedule of basic rates issued 30 days before the date for submission of tenders. A copy of the schedule used by the Contractor in his pricing shall be attached in the Appendix to Conditions of Contract.

25.5 Upon the J.B.C. determining that any of the said basic prices are increased or decreased then the Contract Price shall be increased or decreased by the amount to be assessed by the Project Manager based upon the difference between the price set out in the schedule of basic rates issued 30 days before the date for submission of tenders and the rate published by the J.B.C. and applied to the quantum of the relevant materials which have not been taken into account in arriving at the amount of any interim certificate under clause 23 of these Conditions issued before the date of publication of such increase or decrease.

25.6 No adjustment shall be made in respect of changes in basic prices of materials which occur after the date for Completion except during such other period as may be granted as an extension of time under clause 17.0 of these Conditions.

25.7 The provisions of sub-clause 25.1 to 25.2 herein shall not apply in respect of any materials included in the schedule of basic rates.

26. Retention

26.1 The Employer shall retain from each payment due to the Contractor the proportion stated in the Appendix to Conditions of Contract until Completion of the whole of the Works. On Completion of the whole of the Works, half the total amount retained shall be repaid to the Contractor and the remaining half when the Defects Liability Period has passed and the Project Manager has certified that all defects notified to the Contractor before the end of this period have been corrected.

27. Liquidated Damages

- 27.1 The Contractor shall pay liquidated damages to the Employer at the rate stated in the Appendix to Conditions of Contract for each day that the actual Completion Date is later than the Intended Completion Date. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not alter the Contractor's liabilities.
- 27.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rate specified in Clause 23.30

28. Securities

- 28.1 The Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount and form and by a reputable bank acceptable to the Employer, and denominated in Kenya Shillings. The Performance Security shall be valid until a date 30 days beyond the date of issue of the Certificate of Completion.

29. Dayworks

- 29.1 If applicable, the Dayworks rates in the Contractor's tender shall be used for small additional amounts of Work only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.
- 29.2 All work to be paid for as Dayworks shall be recorded by the Contractor on Forms approved by the Project Manager. Each completed form shall be verified and signed by the Project Manager within two days of the Work being done.
- 29.3 The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.

30. Liability and Insurance

- 30.1 From the Start Date until the Defects Correction Certificate has been issued, the following are the Employer's risks:
- (a) The risk of personal injury, death or loss of or damage to property (excluding the Works, Plant, Materials and Equipment), which are due to;

- (i) use or occupation of the Site by the Works or for the purpose of the Works, which is the unavoidable result of the Works, or
 - (ii) negligence, breach of statutory duty or interference with any legal right by the Employer or by any person employed by or contracted to him except the Contractor.
 - (b) The risk of damage to the Works, Plant, Materials, and Equipment to the extent that it is due to a fault of the Employer or in Employer's design, or due to war or radioactive contamination directly affecting the place where the Works are being executed.
- 30.2 From the Completion Date until the Defects Correction Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is the Employer's risk except loss or damage due to;
- (a) a defect which existed on or before the Completion Date.
 - (b) an event occurring before the Completion Date, which was not itself the Employer's risk
 - (c) the activities of the Contractor on the Site after the Completion Date.
- 30.3 From the Start Date until the Defects Correction Certificate has been issued, the risks of personal injury, death and loss of or damage to property (including, without limitation, the Works, Plant, Materials, and Equipment) which are not Employer's risk are Contractor's risks.
- The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts stated in the Appendix to Conditions of Contract for the following events;
- (a) loss of or damage to the Works, Plant, and Materials;
 - (b) loss of or damage to Equipment;
 - (c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract, and
 - (d) Personal injury or death.
- 30.4 Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager's approval before the Start Date. All such insurance shall provide for compensation required to rectify the loss or damage incurred.
- 30.5 If the Contractor does not provide any of the policies and certificates required, the Employer may affect the insurance which the Contractor should have provided and recover the premiums from payments

otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.

30.6 Alterations to the terms of insurance shall not be made without the approval of the Project Manager. Both parties shall comply with any conditions of insurance policies.

31. Completion and taking over

31.1 Upon deciding that the Works are complete, the Contractor shall issue a written request to the Project Manager to issue a Certificate of Completion of the Works. The Employer shall take over the Site and the Works within seven [7] days of the Project Manager's issuing a Certificate of Completion.

32. Final Account

32.1 The Contractor shall issue the Project Manager with a detailed account of the total amount that the Contractor considers payable to him by the Employer under the Contract before the end of the Defects Liability Period. The Project Manager shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 30 days of receiving the Contractor's account if it is correct and complete. If it is not, the Project Manager shall issue within 30 days a schedule that states the scope of the corrections or additions that are necessary. If the final account is still unsatisfactory after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a Payment Certificate. The Employer shall pay the Contractor the amount due in the Final Certificate within 60 days.

33. Termination

33.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract. These fundamental breaches of Contract shall include, but shall not be limited to, the following;

- (a) the Contractor stops work for 30 days when no stoppage of work is shown on the current program and the stoppage has not been authorised by the Project Manager;
- (b) the Project Manager instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within 30 days;
- (c) the Contractor is declared bankrupt or goes into liquidation other than for a reconstruction or amalgamation;

- (d) a payment certified by the Project Manager is not paid by the Employer to the Contractor within 30 days (for Interim Certificate) or 60 days (for Final Certificate) of issue.
- (e) the Project Manager gives notice that failure to correct a particular defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Project Manager;
- (f) the Contractor does not maintain a security, which is required.

33.2 When either party to the Contract gives notice of a breach of Contract to the Project Manager for a cause other than those listed under Clause 33.1 above, the Project Manager shall decide whether the breach is fundamental or not.

33.3 Notwithstanding the above, the Employer may terminate the Contract for convenience.

33.4 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as reasonably possible. The Project Manager shall immediately thereafter arrange for a meeting for the purpose of taking record of the Works executed and materials, goods, equipment and temporary buildings on Site.

34. Payment Upon Termination

34.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Project Manager shall issue a certificate for the value of the Work done and materials ordered and delivered to Site up to the date of the issue of the certificate. Additional liquidated damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be a debt payable by the Contractor.

34.2 If the Contract is terminated for the Employer's convenience or because of a fundamental breach of Contract by the Employer, the Project Manager shall issue a certificate for the value of the Work done, materials ordered, the reasonable cost of removal of equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works.

34.3 The Employer may employ and pay other persons to carry out and complete the Works and to rectify any defects and may enter upon the Works and use all materials on the Site, plant, equipment and temporary works.

34.4 The Contractor shall, during the execution or after the completion of the Works under this clause remove from the Site as and when required, within such reasonable time as the Project Manager may in writing specify, any temporary buildings, plant, machinery, appliances, goods or materials belonging to or hired by him, and in default the Employer may (without being responsible for any loss or damage) remove and sell any such property of the Contractor, holding the proceeds less all costs incurred to the credit of the Contractor. Until after completion of the Works under this clause the Employer shall not be bound by any other provision of this Contract to make any payment to the Contractor, but upon such completion as aforesaid and the verification within a reasonable time of the accounts therefore the Project Manager shall certify the amount of expenses properly incurred by the Employer and, if such amount added to the money paid to the Contractor before such determination exceeds the total amount which would have been payable on due completion in accordance with this Contract the difference shall be a debt payable to the Employer by the Contractor; and if the said amount added to the said money be less than the said total amount, the difference shall be a debt payable by the Employer to the Contractor.

35. Release from Performance

35.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer or the Contractor, the Project Manager shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop Work as quickly as possible after receiving this certificate and shall be paid for all Work carried out before receiving it.

36. Corrupt gifts and payments of commission

The Contractor shall not;

- (a) Offer or give or agree to give to any person in the service of the Employer any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other Contract for the Employer or for showing or forbearing to show favour or disfavour to any person in relation to this or any other contract for the Employer.
- (b) Enter into this or any other contract with the Employer in connection with which commission has been paid or agreed to be paid by him or on his behalf or to his knowledge, unless before the Contract is made particulars of any such commission and of the terms and conditions of any agreement for the payment thereof have been disclosed in writing to the Employer.

Any breach of this Condition by the Contractor or by anyone employed by him or acting on his behalf (whether with or without the knowledge of the Contractor) shall be an offence under the provisions of the Public Procurement Regulations issued under The Exchequer and Audit Act Cap 412 of the Laws of Kenya.

37. Settlement Of Disputes

37.1 In case any dispute or difference shall arise between the Employer or the Project Manager on his behalf and the Contractor, either during the progress or after the completion or termination of the Works, such dispute shall be notified in writing by either party to the other with a request to submit it to arbitration and to concur in the appointment of an Arbitrator within thirty days of the notice. The dispute shall be referred to the arbitration and final decision of a person to be agreed between the parties. Failing agreement to concur in the appointment of an Arbitrator, the Arbitrator shall be appointed by the Chairman or Vice Chairman of any of the following professional institutions;

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

On the request of the applying party. The institution written to first by the aggrieved party shall take precedence over all other institutions.

37.2 The arbitration may be on the construction of this Contract or on any matter or thing of whatsoever nature arising thereunder or in connection therewith, including any matter or thing left by this Contract to the discretion of the Project Manager, or the withholding by the Project Manager of any certificate to which the Contractor may claim to be entitled to or the measurement and valuation referred to in clause 23.0 of these conditions, or the rights and liabilities of the parties subsequent to the termination of Contract.

37.3 Provided that no arbitration proceedings shall be commenced on any dispute or difference where notice of a dispute or difference has not been given by the applying party within ninety days of the occurrence or discovery of the matter or issue giving rise to the dispute.

37.4 Notwithstanding the issue of a notice as stated above, the arbitration of such a dispute or difference shall not commence unless an attempt has in the first instance been made by the parties to settle such

dispute or difference amicably with or without the assistance of third parties. Proof of such attempt shall be required.

37.5 Notwithstanding anything stated herein the following matters may be referred to arbitration before the practical completion of the Works or abandonment of the Works or termination of the Contract by either party:

37.5.1 The appointment of a replacement Project Manager upon the said person ceasing to act.

37.5.2 Whether or not the issue of an instruction by the Project Manager is empowered by these Conditions.

37.5.3 Whether or not a certificate has been improperly withheld or is not in accordance with these Conditions.

37.5.4 Any dispute or difference arising in respect of war risks or war damage.

37.6 All other matters shall only be referred to arbitration after the completion or alleged completion of the Works or termination or alleged termination of the Contract, unless the Employer and the Contractor agree otherwise in writing.

37.7 The Arbitrator shall, without prejudice to the generality of his powers, have powers to direct such measurements, computations, tests or valuations as may in his opinion be desirable in order to determine the rights of the parties and assess and award any sums which ought to have been the subject of or included in any certificate.

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

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

SECTION V – APPENDIX TO CONDITIONS OF CONTRACT

THE EMPLOYER IS

Name: MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY (M.U.S.T)

Address: - 972 – 60200 MERU, Kenya

Name of Authorized Representative: VICE CHANCELLOR.

Telephone: +254 704508454

Facsimile:

E-mail: yc@must.ac.ke

The Project Manager is

Name: OTTO MRUTTU + PARTNERS ARCHITECTS

Address: P.O. Box 76382- 00508 NAIROBI, KENYA

Telephone: 0202722410

Facsimile:

E-mail: ottomruttu.com

The name (and identification number) of the Contract is PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY PN LR NO. 27425.

The Works consist of SPORST FIELDS AND SUPPORT FACILITIES.

Tender validity is 120 days

The Start Date shall be AGREED WITH THE PROJECT MANAGER

The Intended Completion Date for the whole of the Works shall be SUBJECTED TO QUOTATION.THE BIDDER TO QUOTE FOR CONSTRUCTION PERIOD.

The following documents also form part of the Contract:
AS LISTED IN CLAUSE 2.30 OF THE CONDITIONS OF CONTRACT

The Contractor shall submit a revised program for the Works within 7 days of delivery of the Letter of Acceptance.

The Site Possession Date shall be AGREED WITH THE PROJECT MANAGER

The Site is located at MERU-MAUA ROAD INSIDE MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R.NO.27425-(NCHIRU) IN MERU COUNTY

The Defects Liability period is **180** days for Building Works and **352** days for Civil Works. NOTE: All equipment to have a minimum of 1 (one) year warranty. The tenderer shall be agreeable to undertake 3 (three) years maintenance period after expiry of warranty period and if called upon to do so by the employer.

The minimum insurance covers shall be;

1. The minimum cover for insurance of the Works and of Plant and Materials in respect of the Contractor's faulty design is Kshs 2.00M
2. The minimum cover for loss or damage to Equipment is Kshs 1.00M
3. The minimum for insurance of other property is Kshs 5.00M
4. The minimum cover for personal injury or death insurance
 - For the Contractor's employees is Kshs 2.00M
 - And for other people is Kshs 2.00M

The following events shall also be Compensation Events:

1. AS LISTED IN CLAUSE 24 OF THE CONDITIONS OF CONTRACT.
2. _____
3. _____
4. _____

The period between Program updates is 14 days.

The amount to be withheld for late submission of an updated Program is FULL CERTIFICATE

The proportion of payments retained is 10% percent. The limit of retention is 5% percent.

The Price Adjustment Clause SHALL NOT APPLY (shall/shall not) apply as per Joint Building Council issued rates deviations (**NO PRICE DEVIATIONS WHATSOEVER SHALL BE ENTERTAINED**)

The Liquidated and Ascertained Damages and ascertained for the whole of the Works is Kshs. 100,000.00 (One Hundred Thousand) (per calendar week)

The Performance Security shall be for the following minimum amounts equivalent as a percentage of the Contract Price **10** percent (%) **IN FORM OF BANK GUARANTEE OR PPOA APPROVED INSURANCE COMPANY.**

The Completion Period for the Works is **SUBJECTED TO QUOTATION.**
THE BIDDER TO QUOTE FOR CONSTRUCTION PERIOD

The rate of exchange for calculation of foreign currency payments is **NOT APPLICABLE**

The schedule of basic rates used in pricing by the Contractor is as attached [*Contractor to attach*].

Advance Payment **SHALL NOT BE APPLICABLE**

Price for VAT should be included at Grand Summary page and amount shown

PREPARATION OF TENDERS.

The tenderer shall submit **ONE ORIGINAL** and **ONE COPY (HARD COPY ONLY)** of the bid document in accordance with clause 3.14 page 12 of the Instructions to tenderers.

SUBMISSION OF TENDERS.

The tenderer shall seal the original and copy of the tender in two inner envelopes and one outer envelope, duly marking the inner envelopes as “**ORIGINAL**” and “**COPY**” as appropriate. The inner and outer envelopes shall:

- A. be addressed to the Employer at the address provided in the invitation to tender;**
- B. Provide a warning not to open before the specified time and date for tender opening.**

TENDER OPENING AND EVALUATION

The tenderers’ names, the tender prices, the total amount of each tender and of any alternative tender (if alternatives have been requested or permitted), any discounts, tender modifications and withdrawals, the presence or absence of Tender Security, and such other details as may be considered appropriate, will be announced by the Employer at the opening. Minutes of the tender opening, including the information disclosed to those present will be prepared by the Employer.

EVALUATION AND ERROR CORRECTION

Tender figure as announced at the tender opening shall not be subject to any arithmetic error correction as per section 82 of the Public Procurement and Disposal Act 2015.

COMPARISON OF RATES.

The evaluation committee will compare rates offered by different qualified bidders and note if there is inconsistency of rates or front loading. The Evaluation Committee will make a judgment and appropriate decision based on this comparison giving evidence for the decision made.

TENDER DOCUMENTS

The complete set of tender documents comprises the documents listed below and any addenda issued in accordance with Clause 2.4.

- A. These Instructions to Tenderers
- B. Appendix to Instructions to Tenderers
- C. Form of Tender and Qualification Information
- D. Conditions of Contract
- E. Appendix to Conditions of Contract
- F. Bills of Quantities
- G. Forms of Securities

EVALUATION OF TENDERS

Evaluation of tenders shall be carried out in accordance with the criteria that has been set out.

STAGE 1: MANDATORY DOCUMENTS

These are mandatory requirements and bidders are expected to attach all the documents in order to proceed to the next stage of evaluation. This stage shall be evaluated on a YES/NO basis.

S/No.	Particulars	YES/No
1.	Attach a copy of Certificate of Registration/Incorporation	
2.	Attach a copy of Valid Tax Compliance Certificate from Kenya Revenue Authority (will be verified only through TCC Checker)	
3.	Attach a copy of PIN/VAT Certificate	
4.	Must provide a Bid Bond of Kshs. 5,000,000.00 valid for 120 days from the date of Tender Opening	
5.	Must submit copies of certified Audited Financial Accounts for the last 3 years (2016, 2017 & 2018.)	

STAGE 2: TECHNICAL EVALUATION CRITERIA

This stage will be evaluated on a scoring basis as follows:

S/N	EVALUATION ATTRIBUTES	SCORE	MARKS	AWARD
1	<p>PHYSICAL FACILITIES</p> <ul style="list-style-type: none"> - Evidence of physical address - e.g. title deed/lease agreement - Utility bills. 	<p>4 marks</p> <p>1 mark</p>	5 marks	
2	<p>PLANT AND EQUIPMENT</p> <p>List of appropriate Equipment related to the Building and Constructions i.e. provide proof of ownership and availability/valid lease agreements/hire agreements and photographs of the following equipment;</p> <ul style="list-style-type: none"> i) Sand screen machine - 1 No. ii) Drill machine – 1 No. iii) Concreting mixer – 1No. iv) Concrete Vibrators – 2 No V) Reinforcement Cutting and Bending Machine - 1No. 	<p>2 marks</p> <p>2 marks</p> <p>2 marks</p> <p>2 marks</p> <p>2 marks</p>	10 marks	
3	<p>BUILDING CONSTRUCTION EXPERIENCE</p> <ul style="list-style-type: none"> Over ten (10) years 5-10 years Below 5 years 	<p>10 marks</p> <p>6 marks</p> <p>3 marks</p>	10 marks	
4	<p>Company's Annual Turnover (Kshs.)</p> <ul style="list-style-type: none"> Over 500 million 100 – 500 million Below 100 million 	<p>10 marks</p> <p>6 marks</p> <p>3 marks</p>	10 marks	
5	<p>Provide proof for projects undertaken whose individual contract value is at least Kshs. 50,000,000.00 and undertaken within the last 5yrs within the country. <i>(As a proof, attach BOTH letter of award and final certificate or a minimum of 5 interim certificates from AAK for projects carried out to private institutions. For projects carried out to public institutions, attach letter of award and final certificate or a minimum of 5 interim certificates from Ministry of Public Works -MoPW).</i></p> <p>Meru University of Science and Technology at its discretion reserves the right to verify the authenticity of the documents submitted.</p>	<p>Each project with letter of award and certificate from AAK /MoPW @ 5 marks, maximum 15- marks</p>	15 marks	

6	<p>COMPANY AND STAFF PROFILE</p> <p><i>Managerial and Key Personnel Competency Profile</i> - Provide Details of any relevant certifications and/or accreditations by principals and attach copies of such certification. (At least one principal must have a relevant certification / accreditation in construction related course</p> <p>-The Key Technical staff with certification from relevant professional body</p> <ol style="list-style-type: none"> 1. Architect – Degree in Architecture and registered with BORAQS 2. Civil Engineer – Degree in Civil Engineering, Registered Engineer with Engineering Registration Board of Kenya. 3. Quantity Surveyor – Degree in Quantity Surveying or Building Economics and Registered with BORAQS 4. Site Agent- Diploma in Building works or related services with at least 5 years’ experience as site agent 	<p>5 marks</p> <p>4 marks</p> <p>4 marks</p> <p>4 marks</p> <p>3 marks</p>	20 marks	
TOTAL SCORE			70 Marks	

NOTE: To qualify for the financial evaluation stage bidders are expected to score at least 50 marks out of maximum possible 70 marks at the technical evaluation stage.

STAGE 3: FINANCIAL EVALUATION

NOTE: Evaluation using the following formula: Price quoted shall contribute to 30 marks of the total score and this shall be evaluated relatively on the basis of lowest quoted price using the formula

$$P_c = PL / P \times 30$$

Where; P_c is the allocated score,

PL is the lowest quoted price of bids passing the technical evaluation and P is the bidder’s price under consideration.

The total score is the sum of the technical evaluation score plus the financial evaluation score. The successful bidder shall be awarded the contract on the basis of combined score and in consideration of due diligence report: Technical and Financial.

STAGE 4: DUE DILIGENCE

Meru University of Science and Technology shall inspect the previous works indicated in your tender document and interview management to confirm the information given.

AWARD OF CONTRACT

The bidder with the highest combined Technical and Financial scores shall be awarded the tender upon confirmation of the documented evidences submitted.

Note:

In case of a tie in the combined score, the bidder with the lowest tender sum shall be awarded the contract.

In case of a tie in the tender sum, the bidder with the highest combined score shall be awarded the contract.

SECTION VI – SPECIFICATIONS AND LIST OF DRAWINGS

Specifications are included in the respective documents together with the bill of quantities.

Drawings to be availed for viewing upon request during site visit.

SECTION VII - BILL OF QUANTITIES

The Bills of Quantities are issued as follows:-

- 1) VOLUME 1 OF 3 -BUILDERS WORK BOQ.
- 2) VOLUME 2 OF 3 – ELECTRICAL WORKS BOQ.
- 3) VOLUME OF 3 OF 3 – MECHANICAL WORKS BOQ.

SECTION VIII – STANDARD FORM

- i. Form of Invitation for Tenders
- ii. Form of Tender
- iii. Letter of Acceptance
- iv. Form of Agreement
- v. Form of Tender Security
- vi. Performance Bank Guarantee
- vii. Performance Bond
- viii. Bank Guarantee for Advance Payment
- ix. Qualification Information
- x. Tender Questionnaire
- xi. Confidential Business Questionnaire.
- xii. Details of Sub-Contractors
- xiii. Request for Review Form

FORM OF INVITATION FOR TENDERS

_____ [date]

To: _____ [name of Contractor]
_____ [address]

Dear Sirs:

Reference: _____ [Contract Name]

You have been prequalified to tender for the above project.

We hereby invite you and other prequalified tenderers to submit a tender for the execution and completion of the above Contract.

A complete set of tender documents may be purchased by you from _____

_____ [mailing address, cable/telex/facsimile numbers].

Upon payment of a non-refundable fee of Kshs _____

All tenders must be accompanied by _____ number of copies of the same and a tender security in the form and amount specified in the tendering documents, and must be delivered to

_____ [address and location]

at or before _____ (time and date). Tenders will be opened immediately thereafter, in the presence of tenderers' representatives who choose to attend.

Please confirm receipt of this letter immediately in writing by cable/facsimile or telex.

Yours faithfully,

_____ Authorised Signature

_____ Name and Title

FORM OF TENDER

TO: _____ [Name of Employer] _____ [Date]
_____ [Name of Contract]

Dear Sir,

1. In accordance with the Conditions of Contract, Specifications, Drawings and Bills of Quantities/Schedule of Rates for the execution of the above named Works, we, the undersigned offer to construct, install and complete such Works and remedy any defects therein for the sum of Kshs. _____ [Amount in figures] Kenya Shillings _____ [Amount in words]
2. We quote to carry out the works in _____ weeks to which we have provided a work program.
3. We undertake, if our tender is accepted, to commence the Works as soon as is reasonably possible after the receipt of the Employer's Representative's notice to commence, and to complete the whole of the Works comprised in the Contract within the time stated in the Appendix to Conditions of Contract.
4. We quote to carry out the works in _____ weeks to which we have provided a work program.
5. We agree to abide by this tender until _____ [Insert date], and it shall remain binding upon us and may be accepted at any time before that date.
6. Unless and until a formal Agreement is prepared and executed this tender together with your written acceptance thereof, shall constitute a binding Contract between us.
7. We understand that you are not bound to accept the lowest or any tender you may receive.

Dated this _____ day of _____ 20_____

Signature _____ in the capacity of _____

duly authorized to sign tenders for and on behalf of
_____ [Name of Tenderer] of
_____ [Address of Tenderer]

Witness; Name _____

Address _____

Signature _____

Date _____

LETTER OF ACCEPTANCE
[letterhead paper of the Employer]

_____ [date]

To: _____
[name of the Contractor]

[address of the Contractor]

Dear Sir,

This is to notify you that your Tender dated _____
for the execution of _____
[name of the Contract and identification number, as given in the Tender documents]
for the Contract Price of Kshs. _____ [amount in
figures][Kenya Shillings _____ (amount in words)] in
accordance with the Instructions to Tenderers is hereby accepted.

You are hereby instructed to proceed with the execution of the said Works in
accordance with the Contract documents.

Authorized Signature

Name and Title of Signatory

Attachment: Agreement

FORM OF AGREEMENT

THIS AGREEMENT, made the _____ day of _____ 20 _____ between _____ of [or whose registered office is situated at] _____ (hereinafter called “the Employer”) of the one part AND _____ of [or whose registered office is situated at] _____ (hereinafter called “the Contractor”) of the other part.

WHEREAS THE Employer is desirous that the Contractor executes

_____ (*name and identification number of Contract*) (hereinafter called “the Works”) located at _____ [*Place/location of the Works*] and the Employer has accepted the tender submitted by the Contractor for the execution and completion of such Works and the remedying of any defects therein for the Contract Price of Kshs _____ [*Amount in figures*], Kenya Shillings _____ [*Amount in words*].

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents shall be deemed to form and shall be read and construed as part of this Agreement i.e.
 - (i) Letter of Acceptance
 - (ii) Form of Tender
 - (iii) Conditions of Contract Part I
 - (iv) Conditions of Contract Part II and Appendix to Conditions of Contract
 - (v) Specifications
 - (vi) Drawings
 - (vii) Priced Bills of Quantities/Priced Schedule of Rates [whichever is applicable]
3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby

covenants with the Employer to execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract.

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

IN WITNESS whereof the parties thereto have caused this Agreement to be executed the day and year first before written.

The common Seal of _____

Was hereunto affixed in the presence of _____

Signed Sealed, and Delivered by the said _____

Binding Signature of Employer _____

Binding Signature of Contractor _____

In the presence of (i) Name _____

Address _____

Signature _____

[ii] Name _____

Address _____

Signature _____

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 of20.....

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 Security, 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]

PERFORMANCE BANK GUARANTEE

To: _____(Name of Employer) _____(Date)
_____ (Address of Employer)

Dear Sir,

WHEREAS _____(hereinafter called "the Contractor") has undertaken, in pursuance of Contract No. _____ dated _____ to execute _____ (hereinafter called "the Works");

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognised bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee:

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of Kshs. _____ (*amount of Guarantee in figures*) Kenya Shillings _____ (*amount of Guarantee in words*), and we undertake to pay you, upon your first written demand and without civil or argument, any sum or sums within the limits of Kenya Shillings _____ (*amount of Guarantee in words*) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change, addition or other modification of the terms of the Contract or of the Works to be performed thereunder or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this Guarantee, and we hereby waive notice of any change, addition, or modification.

This guarantee shall be valid until the date of issue of the Certificate of Completion.

SIGNATURE AND SEAL OF THE GUARANTOR _____

Name of Bank _____

Address _____

Date _____

BANK GUARANTEE FOR ADVANCE PAYMENT

To: _____ [name of Employer] _____ (Date)
_____ [address of Employer]

Gentlemen,

Ref: _____ [name of Contract]

In accordance with the provisions of the Conditions of Contract of the abovementioned

Contract, We, _____ [name and Address of Contractor] (hereinafter called "the Contractor") shall deposit with _____ [name of Employer] a bank guarantee to guarantee his proper and faithful performance under the said Contract in an amount of Kshs. _____ [amount of Guarantee in figures] Kenya Shillings _____ [amount of Guarantee in words].

We, _____ [bank or financial institution], as instructed by the Contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to _____ [name of Employer] on his first demand without whatsoever right of objection on our part and without his first claim to the Contractor, in the amount not exceeding Kshs _____ [amount of Guarantee in figures] Kenya Shillings _____ [amount of Guarantee in words], such amount to be reduced periodically by the amounts recovered by you from the proceeds of the Contract.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed thereunder or of any of the Contract documents which may be made between _____ [name of Employer] and the Contractor, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

No drawing may be made by you under this guarantee until we have received notice in writing from you that an advance payment of the amount listed above has been paid to the Contractor pursuant to the Contract.

This guarantee shall remain valid and in full effect from the date of the advance payment under the Contract until _____ (name of Employer) receives full payment of the same amount from the Contract.

Yours faithfully,

Signature and Seal _____

Name of the Bank or financial institution _____

Address _____

Date _____

Witness: Name: _____

Address: _____

Signature: _____

Date: _____

QUALIFICATION INFORMATION

1. Individual Tenderers or Individual Members of Joint Ventures

1.1 Constitution or legal status of tenderer (attach copy or Incorporation Certificate);

Place of registration: _____

Principal place of business _____

Power of attorney of signatory of tender _____

1.2 Total annual volume of construction work performed in the last five years

Year	Volume	
	Currency	Value

1.3 Work performed as Main Contractor on works of a similar nature and volume over the last five years. Also list details of work under way or committed, including expected completion date.

Project name	Name of client and contact person	Type of work performed and year of completion	Value of Contract
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

1.4 Major items of Contractor's Equipment proposed for carrying out the Works. List all information requested below.

Item of Equipment	Description, Make and age (years)	Condition(new, good, poor) and number available	Owned, leased (from whom?), or to be purchased (from whom?)
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	
(etc.)			

1.5 Qualifications and experience of key personnel proposed for administration and execution of the Contract. Attach biographical data.

Position	Name	Years of experience (general)	Years of experience in proposed position
Project Manager _____ _____	_____ _____	_____ _____	_____ _____
(etc.)			

1.6 Financial reports for the last five years: balance sheets, profit and loss statements, auditor's reports, etc. List below and attach copies.

1.7 Evidence of access to financial resources to meet the qualification requirements: cash in hand, lines of credit, etc. List below and attach copies of supportive documents.

1.8 Name, address and telephone, telex and facsimile numbers of banks that may provide reference if contacted by the Employer.

1.9 Statement of compliance with the requirements of Clause 1.2 of the Instructions to Tenderers.

1.10 Proposed program (work method and schedule) for the whole of the Works.

2 Joint Ventures

- 2.0 The information listed in 1.1 – 2.0 above shall be provided for each partner of the joint venture.
- 2.1 The information required in 1.11 above shall be provided for the joint venture.
- 2.2 Attach the power of attorney of the signatory(ies) of the tender authorizing signature of the tender on behalf of the joint venture
- 2.3 Attach the Agreement among all partners of the joint venture (and which is legally binding on all partners), which shows that:
 - a) all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms;
 - b) one of the partners will be nominated as being in charge, authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the joint venture; and
 - c) the execution of the entire Contract, including payment, shall be done exclusively with the partner in charge.

TENDER QUESTIONNAIRE

Please fill in block letters.

1. Full names of tenderer;

.....

2. Full address of tenderer to which tender correspondence is to be sent (unless an agent has been appointed below);

.....

3. Telephone number (s) of tenderer;

.....

4. Telex of tenderer;

.....

5. Name of tenderer's representative to be contacted on matters of the tender during the tender period;

.....

6. Details of tenderer's nominated agent (if any) to receive tender notices. This is essential if the tenderer does not have his registered address in Kenya (name, address, telephone, telex);

.....

.....

Signature of Tenderer

Make copy and deliver to: _____ (*Name of Employer*)

CONFIDENTIAL BUSINESS QUESTIONNAIRE

You are requested to give the particulars indicated in Part 1 and either Part 2 (a), 2 (b) or whichever applies to your type of business.

You are advised that it is a serious offence to give false information on this Form.

Part 1 – General

Business Name

Location of business premises; Country/Town.....

Plot No..... Street/Road

Postal Address..... Tel No.....

Nature of Business.....

Current Trade Licence No..... Expiring date.....

Maximum value of business which you can handle at any time: K.
pound.....

Name of your bankers.....

Branch.....

Part 2 (a) – Sole Proprietor

Your name in full..... Age.....

Nationality..... Country of Origin.....

Citizenship details

Part 2 (b) – Partnership

Give details of partners as follows:

	<i>Name in full</i>	<i>Nationality</i>	<i>Citizenship Details</i>	<i>Shares</i>
1
2
3

Private or public.....

State the nominal and issued capital of the Company-

Nominal Kshs.....

Issued Kshs.....

Give details of all directors as follows:

Name in full . Nationality. Citizenship Details*. Shares.

1.
.....

2.
.....

3.
.....

4.
.....

Part 2(d) – Interest in the Firm:

Is there any person / persons in(Name of Employer) who has interest in this firm? Yes/No.....(Delete as necessary)

I certify that the information given above is correct.

.....
(Title)

.....
(Signature)

.....
(Date)

- Attach proof of citizenship

STATEMENT OF FOREIGN CURRENCY REQUIREMENTS

(See Clause 23] of the Conditions of Contract)

In the event of our Tender for the execution of _____
_____ (name of Contract) being accepted, we would
require in accordance with Clause 21 of the Conditions of Contract, which is
attached hereto, the following percentage:

(Figures)..... (Words).....

of the Contract Sum, (Less Fluctuations) to be paid in foreign currency.

Currency in which foreign exchange element is required:

.....

Date: The Day of 20.....

Enter 0% (zero percent) if no payment will be made in foreign currency.

Maximum foreign currency requirement shall be _____(percent) of
the Contract Sum, less Fluctuations.

(Signature of Tenderer)

DETAILS OF SUB-CONTRACTORS

If the Tenderer wishes to sublet any portions of the Works under any heading, he must give below details of the sub-contractors he intends to employ for each portion.

Failure to comply with this requirement may invalidate the tender.

- (1) Portion of Works to be sublet:
- (i) Full name of Sub-contractor
and address of head office:
-
- (ii) Sub-contractor's experience
of similar works carried out
in the last 3 years with
Contract value:
-
-
-
- (2) Portion of Works to sublet:
- (i) Full name of sub-contractor
and address of head office:
-
-
- (ii) Sub-contractor's experience
of similar works carried out
in the last 3 years with
contract value:
-
-

[Signature of Tenderer)

Date

LETTER OF NOTIFICATION OF AWARD

Address of Procuring Entity

To: _____

RE: Tender No. _____

Tender Name _____

This is to notify that the contract/s stated below under the above mentioned tender have been awarded to you.

1. Please acknowledge receipt of this letter of notification signifying your acceptance.
2. The contract/contracts shall be signed by the parties within 30 days of the date of this letter but not earlier than 14 days from the date of the letter.
3. You may contact the officer(s) whose particulars appear below on the subject matter of this letter of notification of award.

(FULL PARTICULARS) _____

SIGNED FOR ACCOUNTING OFFICER

REPUBLIC OF KENYA
PUBLIC PROCUREMENT ADMINISTRATIVE REVIEW BOARD

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

BETWEEN

.....APPLICANT

AND

.....RESPONDENT (*Procuring Entity*)

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

REQUEST FOR REVIEW

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

- 1.
 - 2.
- etc.

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

- 1.
 - 2.
- etc

SIGNED(Applicant)

Dated on.....day of/...20...

FOR OFFICIAL USE ONLY

Lodged with the Secretary Public Procurement Administrative Review Board on day of20.....

SIGNED
Board Secretary

BILL NO.02
SPECIFICATIONS AND TRADE
PREAMBLES

SPECIFICATIONS AND TRADE PREAMBLES

TRADE PREAMBLES

- A. The General Specification as prepared by **Quanti – Bill Consults Co. Ltd** is issued to the Contractor with the Bills of Quantities.
- B. All items in the Bills of Quantities shall conform to the full Specification for similar items in the General Specification.
- C. Where the wording "as described" is included in the Bills of Quantities this wording shall be construed as either an abbreviation of a detailed description for a similar item in the General Specification or as a reference to the preambles.
- D. Where detailed descriptions in the Bills of Quantities differ in any respect to similar descriptions in the General Specifications, then such descriptions in the Bills of Quantities shall be deemed to take precedence.
- E. These specifications are to be read, understood, observed and or acted upon by the tenderer as may be necessary. Particular attention of the tenderer/contractor is drawn to the section on safety at the end of part one of these general specifications. This is to be strictly observed.

PART ONE

GENERAL SPECIFICATIONS

A. MATERIAL GENERALLY

All materials used on the works shall be new and of the qualities and kinds specified herein and equal to approved samples. Deliveries shall be made sufficiently in advance to enable samples to be taken and tested if required. No materials shall be used until approved and all materials which are not approved or which are damaged, contaminated or have deteriorated in any way or do not comply in any way with the requirements of this specification shall be immediately removed from the site at the Contractor's expense.

B. MATERIALS FOR WHICH THERE IS A KENYA BUREAU OF STANDARDS

SPECIFICATION

All materials used in the works for which a Kenya Bureau of Standard Specification has been published shall conform with the latest edition thereof in every way. The Architect reserves the right to demand that the Contractor shall obtain at his own expense a certificate in respect of any material to state that it is in accordance with the Kenya Bureau of Standard Specifications.

C. MATERIALS FOR WHICH THERE IS NO KENYA BUREAU OF STANDARDS

SPECIFICATION

All materials used in the works for which no Kenya Bureau of Standard Specification has been published shall conform with the British Standard Specifications for such material. If there are no published

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON LR. 27425

standard as specified for any materials, the quality of such materials shall be generally of a Standard equal to those for which there is a Kenya Bureau of Standard or British Standard Specification.

D. ALTERNATIVES TO PROPRIETARY BRANDS

Where materials are specified by their proprietary names or where fittings are specified by catalogue numbers, or descriptions, the contractor may offer material or fittings of alternative manufacture which are of equal quality. Such alternatives must be approved before being used in the works and the Contractor shall allow for this, but prior to tendering he may submit to the Architect for approval the names of any suppliers or manufacturers whose products he intends to use, together with catalogue numbers and descriptions and/or samples but the decision of the Architect will be final.

E. SAMPLES

The Contractor shall furnish for approval, with reasonable promptness all samples of material and workmanship required by the Architect. The Architect shall check and approve such for conformance with the design concept of the works and for compliance with the information given in the Contract Documents. The work shall be in accordance with approved samples.

- a) All material samples shall be delivered to the Architect's Office with all charges in connection therewith paid by the Contractor.
- b) Duplicate final approved samples, in addition to any required for the Contractor's use, shall be furnished to the Architect, one for office use and one for the site.
- c) Samples shall be furnished so as not to delay fabrication, allowing the Architect reasonable time for consideration of the sample submitted.
- d) Each sample shall be properly labelled with the name and quality of the material, Manufacturer's name, name of project, the Contractor's name and the date of submission and the specification number to which the sample refers.

GENERAL SPECIFICATIONS

A. MEASUREMENT AND TESTING EQUIPMENT

The Contractor shall provide the following equipment for carrying out measuring and control tests on the site and maintain in full working order:

- a) Straight edges 2 metres and 4 metres long for testing the accuracy of the finished concrete.
- b) A glass graduated cylinder for use in the silt test of organic impurities in the sand.
- c) Slump test apparatus
- d) 150 mm steel cube moulds with base plates and tamping rod to BS 1881.
- e) Two 30 metre steel tapes
- f) One dumpy or quickset level and staff.
- g) Micrometer.

B. SAFETY

The Contractor shall practice high safety standards in execution of the works and shall comply with: (a) SHE laws that include but may not be limited to:

- a) Work Injury Benefit Act (WIBA) 2007
- b) Occupational Safety and Health Act 2007
- c) Environmental Management & Coordination Act 1999 and its subsidiary legislations
 - i. The building code/building bylaws
 - ii. Any other laws, regulations or practices as may be required by the employer

PART TWO

DEMOLITIONS & ALTERATIONS SPECIFICATIONS

DEMOLITIONS AND ALTERATIONS

A. DEMOLITIONS

Demolitions, taking out and cutting away shall be carefully performed and every precaution shall be taken to ensure the safety of the work. If damage should occur in the carrying out the demolitions or alterations the contractor shall reinstate and make good the same at his own expense.

B. PROTECTION

Supply, erect and maintain during the cutting of openings etc., all necessary protection to the existing premises against damage by weather or other cases.

C. LAYING THE DUST

Allow for laying the dust as far as possible during the alteration by watering with a hose or other means

D. MAKING GOOD

All making good of blockwork, building up of opening etc., shall be solid blockwork unless otherwise described, in cement mortar

(1:4) properly cut, toothed and bonded and pinned up to existing work and pointed where necessary.

E. CREDIT FOR MATERIALS

Unless otherwise specified materials arising from the demolitions and alterations will become the property of the contractor. If the Contractor wishes to allow a credit for any such materials the appropriate allowance should be included in the credit column of the Bills of Quantities. In the event that the Employer wishes to take possession of any such materials the contractor will only be entitled to receive compensation to the amount of credit indicated.

F. DEFINITIONS OF TERMS

The following definitions explain and simplify the terms indicated in the description of the works.

Removal shall include:

- Dismantling/pulling down/taking out/taking up/stripping etc., at the site of the works, getting from the site of the works to the outside of building by whatever means is necessary and disposal.

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Disposal shall include:

- Handling on site to store or to pick up point for loading into skips or lorries transporting away from site to yard, store or tip payment of all tip charges.

Making out shall include:

- Infilling to voids, openings, gaps and the like and matching materials and construction to existing

DEMOLITIONS & ALTERATIONS SPECIFICATIONS

Making good shall include:

- Work as last described consequent on the carrying out of other work.

Form opening in brickwork or blockwork shall include:

- Shoring up and needling as required
- Cutting the opening
- Designing, providing and inserting required beam or lintol and providing any calculations if required and obtaining building regulation approval.
- Providing and inserting cavity gutters and the like forming new arches and the like in facework to match existing.
- Quoining up jambs
- Sealing cavity of hollow walls, at jambs and cill and providing and inserting damp proof course
- Making good facework and features to match existing
- Forming new external sub-cill or sub-thresholds to match existing
- Making good the plasterwork or other applied finishes including making out into reveals and providing metal angle beads to arises where required.
- Removing debris.

Block in/ Blank off/ Fill in opening in brick work or block work shall include:

- Carefully cutting out any flooring in opening and levelling and preparing for raising new work
- Cutting toothing for bonding in new work
- Filling the opening with brickwork or block work to match existing
- Making out facework including cutting out arches, cills or ornamentation around the opening and continuing any general facework pattern
- Wedging and pinning to existing soffit
- Providing and inserting matching damp proof course
- Marking out plasterwork including continuing any existing patterns of labours and making good between new and old work so that after decoration or weathering the original opening cannot be discerned.
- Removal of debris

Remove partition shall include:

- Sorting up if required
- Sizing, providing and inserting required timber beam if the partition is load bearing
- Taking off skirtings, picture rails and the like
- Stripping off lath plaster or other finished and insulation quilts
- Taking out doors, borrowed lights, hatches and the like, frames, linings and architraves and the like within any area of partitioning to be removed
- Dismantling and taking studding or framed work
- Making good plasterwork or other wall and ceiling finishes including cornices and other enrichments
- Making good or making out floor boarding and any applied finishes
- Taking out timber skirtings, picture rails and the like and removing debris.

Repair roof covering shall include:

- The term repair as applied to a tiled or slatted roof includes any or all of the following operations as are necessary:
- Renew broken or missing tiles/slates to match existing including nailing with composition nails securing with copper tingles
- Re-wedge and repoint flashings and making out with new as required Re-make tile/slate verges or eaves including any bedding and pointing Renew defective or missing ridge or hip tiles
- Removal of debris.

DEMOLITIONS & ALTERATIONS SPECIFICATIONS

Renew roof covering shall include:

- The term renew roof covering as applied to a tiled or slatted roof includes:
- Lift and afterwards refix flashings, soakers, ridge, hip and valley coverings etc. Strip existing roofing and battens, sort and set aside sound tiles/slates
- Renew battens and re-lay existing tiles/slates together with new tiles/slates as required all to Match existing including sarking felt underlay whether previously provided or not, and including any special tile/slates to eaves, verges, ridges and valleys
- Re-wedge and repoint flashings
- Remove debris
- The term renew roof covering as applied to a sheet metal, felt or asphalt roof includes: Strip existing roofing
- Remove sub-base as required Lift and afterwards refix flashing Renew roof covering to match existing Re-wedge and repoint flashings Remove debris.

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON LR. 27425

Renew flashings and the like shall include:

The terms renew flashings and the like as applied to pitched or flat roofs includes any or all of the following as may be applicable:

- Strip existing flashings, soakers, gutters, ridge and hop covering
- Renew all work previously removed in material or similar quality and substance
- Re-wedge and repoint all new flashings
- Remove debris.

Ease and adjust shall include:

The term and adjust as applied to doors, cupboards doors, casement sashes and the like includes:

- Rehanging on existing hinges
- Planing edges as necessary
- Oiling locks and hinges and leaving in working order

Overhaul shall include:

The term overhaul applied to doors, cupboard doors, casement sashes and the like includes any or all of the following operations as are necessary:

- Cramp up loose tenon joints and wedge or re-wedge including glueing wedges
- Piercing in any existing hinges or renewing hinges if required
- Plane edges
- Plane off protruding tenons
- Refix ironmongery and locks or renew if required
- Oil locks and hinges
- Renew glass where cracked or broken
- Renew putties where loose, missing or defective

Strip existing installation shall include:

The term strip existing installation in relation to electrical installation includes:

- Disconnecting at mains and making safe
- Disconnecting and taking out all existing conduit, wiring and fittings (except where conduit is to be re-used)

Strip existing installations in relation to plumbing and engineering installations shall include:

- Turning off incoming supplies
- Disconnecting and taking out all existing appliances, fittings and pipework
- Removing defunct pipeclips, fixing and the like.
- Making good walls, floors, ceiling as required.
- Removing debris.

EXCAVATIONS & EARTHWORKS SPECIFICATIONS

EXCAVATION AND EARTHWORKS

A. CODES OF PRACTICE

The contractor shall comply with the following codes of practice:

Site Investigations C.P 2001

Earthworks C.P 2003

Foundations C.P 2004

Protection of building against water from the ground C.P 102

B. INSPECTION OF SITE

The contractor is deemed to have visited the site and to have ascertained the nature of the soil and sub-soils to be excavated. No claim will be allowed on account of these being of a different nature from that for which he had allowed in his prices.

C. PROCEDURE

The excavations and fillings shall be carried out in such a manner and order as the Architect may direct.

D. EXISTING TREES SHRUBS AND GRUBBING UP ROOTS

a) Directions

Cut down and remove shrubs and trees as directed. No shrubs, trees, plants etc., shall be removed except as directed by the Architect and the contractor shall be held responsible for any damage caused by the building operations to those shrubs, trees etc., not so directed to be removed.

b) Grubbing up roots

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

- i. Stumps and roots of large trees shall be completely removed.
- ii. Stumps and roots of small trees, bushes or other vegetation shall be completely removed to a depth of at least 600mm below formation.
- iii. Smaller stumps and roots of vegetation up to 25mm thick shall be completely removed to a depth of 230mm below formation.
- iv. 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.

E. SITE CLEARANCE

All grass, vegetable matter etc., must be removed from or burned on site at the commencement of the contract over areas as directed by the Architect.

F. WHITE ANT-INSECTICIDE TREATMENT

The Contractor must destroy any white ant's nests found within the perimeter of the buildings and within a distance of 20 meters from the buildings externally and take out and destroy queen ants, impregnate holes and tunnels with approved insecticides and back-fill with hard materials well rammed and consolidated.

G. EXCAVATION

- i. The excavations are to be executed to the widths shown on the Drawings, and to the depth below existing ground levels as directed by the Architect in order to obtain satisfactory foundations. If the contractor excavates to any widths or depths greater than those shown on the drawings or as instructed by the Architect he shall at his own expense fill in such widths or depths of excavation beyond that instructed or shown with concrete to the satisfaction to the Architect.
- ii. Level and ram bottoms of all excavations to receive concrete, form stepping if necessary or directed to allow for sloping ground, and well water excavations before pouring concrete.
- iii. The contractor shall report to the Architect when secure bottoms to the excavations have been obtained. Any concrete of other work executed before the excavations have been inspected and approved shall, if so directed, be removed and new work substituted after the excavations have been approved all at the contractor's expense.
- iv. Excavations made below required levels shall be filled with mass concrete (1:4:8) at the contractor's expense.

H. ROCK

(a) Definition

Rock is defined as any material met within the excavations which is of such size or position that it can only be removed by means of wedges, compressed air plant, or other special plant and the Architects opinion shall be final.

(b) Other materials to be taken with normal excavations

Excavations in any material such as compacted murrum, soft tuff, stiff clay or similar materials which in the opinion of the Architect can reasonably, be removed by pick, traxcavator or similar, means will be deemed to be included in the prices of normal excavation.

I. BLASTING

No blasting will be permitted without the prior approval of the Architect and local Authority.

J. BORROW PITS

Borrow pits will only be allowed to be opened up on the site on receipt of permission from the Architect.

K. HARDCORE FILLING

Hardcore for filling under floors etc., shall be good hard stone, ballast or quarry waste (not magadi or similar soft stone) to the approval of the Architect broken to pass not greater than a 150mm ring or to be 75% of the finished thickness of the layers being compacted whichever is the lesser and graded to contain sufficient smaller pieces to fill all voids so that it can be thoroughly compacted. The filling is to be laid in layers each of a consolidated thickness not exceeding 225mm and well watered and compacted by hand or mechanical tampers. The top surface of the hardcore shall be levelled or graded to falls as required and blinding with a 75 mm layer of similar material finely crushed and well rolled and watered immediately before concrete is laid.

L. FILLING OBTAINED FROM THE EXCAVATIONS

Filling obtained from surplus excavated materials is to be free from all weeds, roots, vegetable or other unsuitable materials and is to be filled in layers each of not more than 225 mm finished thickness. Each layer to be well watered and consolidated before the subsequent layer is filled in.

M. MATERIALS FOUND IN THE EXCAVATIONS

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

N. INSECTICIDE / ANTI-TERMITE TREATMENT

The top surface of all filling shall be treated with an approved chemical treatment, applied in accordance with the manufacturers printed instructions. The approved specialist treatment shall include a ten year guarantee against termites.

O. PROTECTION OF PIPES, CABLES ETC.

Before commencing works which include excavations or ground levelling by manual or mechanical excavation the contractor shall at his expense ascertain in writing from the Post Office, K.P. & L. Co. Ltd., Engineer's Department (water & sewers section) and all other public bodies, companies and persons who may be affected, the positions and depths of their respective ducts, cables mains or pipes and appurtenances. He shall thereupon search for and locate such services.

The contractor shall at his own expense effectually prop, protect, underpin, alter, divert, restore and make good as may be necessary all pipes, cables or ducts, poles or wires and their appurtenance disturbed or damaged during the progress of the works, or in consequence thereof.

Except that such services as required to be removed or altered by virtue of the layout of the permanent work and not the manner in which the work is carried out, shall be so removed or altered at the expense of the Employer. The contractor shall be liable for the cost of repairs to any services damaged as a result of

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carrying out the works and shall further be liable for any damage which may be shown during the period of maintenance, to have arisen through the execution of these works.

The rates for excavation, including excavation in rock, must include for trimming, levelling and preparing bottoms and all faces to receive concrete, etc., and for and extra excavation required for planking and strutting. Prices shall include for excavating in any material encountered unless specifically otherwise described, handling, etc., of extra bulk after excavating, or before consolidating, any extra excavation required for formwork or planking and strutting, circular work, grubbing up any old drains, roots, etc., that may be encountered, for trimming sides and levelling and ramming bottoms, forming stepping and trimming excavation or filling of embankments and batters as required.

In his price for the item, keep excavations free from all water, the contractor shall allow and make provision for keeping the whole of the work thoroughly drained and clear of water below the lowest level of any part of them so long as may be required and if considered necessary by the Architect, continuously day and night by petrol or hand pumps or other mechanical appliances, pipes, chutes, dams, manholes, sumps, diversions or any other means necessary for the purpose. Water pumped from the trenches shall be allowed to run down the road channels but shall be conveyed to the nearest surface water sewer, ditch or river through troughs, chutes or pipes.

P. RATES OF DISPOSAL

Rates of disposal of excavated material are to include for the selection of spoil as it arises and for all double handling and re- excavation from spoil heaps not specifically ordered by the Architect.

Q. POLYTHENE SHEETING

Polythene sheeting shall be 1000 gauge or as described obtained from an approved manufacturer. Joints in sheeting shall be treble folded with 150 mm fold and taped at 300 mm intervals with 50 mm wide black plastic adhesive tape as manufactured by sellotape limited. The sheeting shall not be laid loose with sufficient wrinkles to permit shrinkage up to 15%.

R. GRASSED AREAS

Areas to be grassed shall be cleared of all debris and roots and dug up to a depth of 300 mm. Where outcrops of rock or murrum occur, these will be covered with suitable soil to a depth of 150 mm.

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON LR. 27425
PART FOUR

CONCRETE WORK SPECIFICATIONS

CONCRETE WORK GENERAL

A. AUTHORITATIVE STANDARDS AND CODES OF PRACTICE

The following authoritative standards are referred to hereinafter:

British Standard Specifications are published by the British Standards Institutions 2 Park Street London W.1, England (Abbreviated in text to BS).

BS	DATE	TITLE
12:Pt.2	1971	Portland cement (ordinary and rapid hardening)
812	1975	Methods for sampling and testing of mineral aggregates, sand and fillers
882,1201	1973	Aggregate from natural sources for concrete (including granolithic)
1881	1970-71	Methods of testing concrete
1926	1962	Ready mixed concrete
2499	1973	Hot applied joint sealants for concrete pavements
3148	1959	Test for water for making concrete pavements
3921	1974	Clay bricks and blocks
4251	1974	Truck type concrete mixers
4449	1969	Hot rolled steel bars for the reinforcement of concrete
4461	1969	Cold worked steel bars for the reinforcement of concrete
4466	1969	Bending dimensions and scheduling of bars for the reinforcement of concrete
4483	1969	Steel fabric for the reinforcement of concrete

American society for Testing and Materials Standard as published by the American Society for Testing and Materials, 1916 Race

St., Philadelphia PA 19103, U.S.A (abbreviated in text to ASTM)

ASTM	DATE	TITLE
C88-	1973	Soundness of Aggregates by use of Sodium sulphate
C234-	1971	Comparing Concretes on the basis of the Bond development with Reinforcement steel
C282-	1971	Potential Reactivity of Aggregates (Chemical Method)

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The following codes of practice are referred to hereinafter:

The British Standard Codes of Practice published by the Council of Codes of Practice, British Standards Institution 2 Park St, London W.1 England (Abbreviated in text to C.P)

C.P	DATE	TITLE
110:Pt.1,2 &3	1972	The structural use of concrete
C234-116:Pt.2	1976	Structural use of precast concrete
BS 5337	1969	The structural use of concrete for retaining aqueous liquids

Should the Contractor wish to substitute any other authoritative standard or code of practice for any listed above he should submit details of any such together with two complete copies to the Engineer for approval with his Tender. Approval will only be given to the use of such standards where the Engineer considers the proposed standard or code of practice will give a quality or finished work equal to or better than the specified standard.

All insitu concrete shall be in accordance with CP 110 except where superseded by this Specification.

All precast concrete shall be in accordance with CP 116 except where superseded by this specification.

A. BENDING SCHEDULES

The Engineer will issue bar bending schedules in accordance with BS 4466. The Contractor should check these against the drawings before any cutting bending or construction involving the schedule is started.

Any discrepancy should be reported to the Engineer immediately for his clarification. The contractor shall be responsible for any delays or additional work caused solely by his failure to check the schedules.

B. APPROVALS

Well before construction commences the Contractor shall supply to the Engineer for his approval details of his proposed layouts of concreting plant and on site workshop; details of formwork systems and the construction devices, e.g., cranes, chutes, scaffolding, which he proposes to use for the structural work. The information is to be sufficiently detailed to enable the Engineer to approve or otherwise.

The Contractor should note that further approvals are required by the Specification before construction starts. The contractor is wholly responsible for obtaining these approvals and no claim for delays will be entertained due to the contractor's failure to obtain such approvals in adequate time.

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON LR. 27425
CONCRETE WORK SPECIFICATIONS**

MATERIALS

C. CEMENT

Cement, unless otherwise specified, shall be ordinary Portland Cement complying with BS12. The contractor shall obtain a manufacturer's certificate of test in accordance with the appropriate standard for each consignment of cement delivered to the site and shall immediately forward copies of the same to the Engineer for his retention.

Notwithstanding the manufacturer's certificate the Engineer may require that any cement delivered to the site be sampled and tested. Any batch so tested which fails to comply with this specification will be rejected.

All cement shall be delivered to the site in the original sealed bags of the manufacturer or in approved bulk containers.

Cement, unless delivered in bulk, shall be stored in a weatherproof shed, the floor of which shall be raised at least 150 mm above the ground to allow free air circulation. Cement delivered in bulk shall be stored in a weatherproof silo. All cement shall at all times be protected from deterioration.

Each consignment of cement shall be kept separate, identified and used in order of delivery. No two types of cement shall be used in combination.

Any cement which upon inspection is considered by the Engineer to have deteriorated in any way will be rejected.

D. AGGREGATES OF CONCRETE

Aggregates for concrete shall, unless otherwise specified, be aggregates from natural sources complying with BS 882. Additionally, the flakiness index when determined by the sieve method described in BS 812 shall not exceed 35 for any size of concrete aggregate. Fine aggregate within or finer than zone 4 of BS 882 shall not be used.

When tested for soundness in accordance with ASTM Test C 88 -73 the loss of weight after 5 cycles shall not exceed 5 percent for any aggregate.

Aggregate which is potentially reactive when tested in accordance with ASTM Test C289-71 for the alkali aggregate reaction shall not be used. The standard for acceptance being that test shall plot to the left of the solid which is shown in figure 2 of the test standard.

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Well before any concreting work, the Contractor shall forward to the Engineer for approval details of his proposed source of supply of aggregate giving the aggregate group classification and typical physical properties as required by BS 882.

The Contractor shall provide the Engineer with a certificate for his retention showing that all aggregate regularly comply with the requirements of his Specification.

The Engineer may require that any aggregate be tested for soundness in accordance with ASTM Test C88 - 73 before giving approval to any proposed source of supply.

The Engineer may require that any aggregate be tested for potential reactivity in accordance with ASTM Test C289-71.

Notwithstanding any certificate of compliance, the Engineer may at any time require that any aggregate delivered to the site be sampled and tested. Any aggregate so tested which fails to comply with this specification will be rejected.

Coarse aggregate shall be delivered ready screened or screened on site separate nominal single sizes within the limits given in BS 882.

Aggregates of different sizes of types shall be stored in different hoppers or different stockpiles or approved well drained paved areas which shall be separated from each other.

Stockpiles shall be protected against contamination from any source.

Any aggregate which has become contaminated or which does not conform to the above requirements may be rejected by the Engineer.

E. WATER FOR USE WITH CEMENT

Water for use in mixing with cement or for curing concrete shall be from any approved source, clean, fresh and free from organic and other deleterious matter.

The Engineer may require that any water be sampled and tested by the method given in BS 3148. Water failing the criteria given in the appendix to BS 3148 will be rejected.

Water for use in mixing with cement shall neither be hotter than 25 degrees centigrade (77 degrees fahrenheit) nor colder than 5 degrees centigrade (41 degrees Fahrenheit) at the time of mixing.

F. STEEL ROD REINFORCEMENT

Steel rod reinforcement shall consist of:

- (a) Mild steel bar complying with BS 4449 or KS 02-22
- (b) Hot rolled high yield bars complying with BS 4449.

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(c) Cold worked high yield bars complying with BS 4461 as described in the drawing.

Where cold worked high yield bars are to be used these shall be square twisted bars formed by a torsion controlled process.

The contractor shall obtain a manufacturer's certificate of test in accordance with the appropriate standard for each steel batch relating to reinforcement delivered to site and shall immediately forward copies of the same to the Engineer for his retention.

Where hot rolled high yield deformed bar are to be used the results of bond tests to ASTM 234-71, using concrete of the same quality as that to be used in the works, shall be forwarded to the Engineer.

Notwithstanding the manufacturer's certificate, the Engineer may require that any reinforcement delivered to the site be sampled and tested. Any reinforcement so sampled and tested which fails to comply with this specification will be rejected.

All reinforcement shall be stored in clean conditions in an orderly manner to the satisfaction of the Engineer such that the batch to which each piece belongs can be readily identified.

G. STEEL FABRIC REINFORCEMENT

Steel fabric reinforcement shall be electrically cross welded steel mesh reinforcement complying with BS 4483 and of the size and weight specified and made of wire to B.S. 4482.

H. TYING WIRE

Tying wire for fixing reinforcement shall be either:

- (a) No. 16 gauge soft annealed iron wire, or
- (b) No. 18 gauge stainless steel wire.

I. SPACERS

Spacers block required for ensuring that the reinforcement is correctly positioned shall be as small as possible consistent with their purpose, of a shape acceptance to the Engineer, and designed so that they will not overturn when the concrete is placed. Unless otherwise approved they shall be made of concrete with 10 mm maximum aggregate size and mix proportions to produce the same strength as the adjacent concrete. Wire shall be cast in the block for the purpose of tying it to the reinforcement. Spacer block of concrete shall not be used until at least 7 days old.

J. ADMIXTURES

No admixtures or cements containing additives shall be used in concrete unless specified or approved by the engineer. Such approval will not be given unless in the Engineer's opinion specific benefit to the density or quality of the concrete will result.

K. WALL TIES

Wall Ties between concrete and adjoining block or block walling shall be “Abbey” slots and anchors as supplied by Abbey Building supplies Ltd or similar approved.

L. JOINT FILLERS

Joint fillers unless otherwise stated shall be “flexcell” as manufactured by Expedited Ltd, or similar approved and placed in accordance with the manufacturer’s instructions.

M. JOINT SEALANTS

Joint sealants shall be as described in the drawings and approved by the Engineer. Sealant shall be used strictly in accordance with the manufacturer’s instructions.

N. HOLLOW CLAY POTS

Pots shall be burnt clay blocks conforming to BS 3921 or similar approved. They shall be true to shape and free from cracks or distortion.

O. WATER STOPS

Water stops unless otherwise stated shall be. Sika water bar. As manufactured by Sika International or similar approved and placed and jointed in accordance with the manufacturer’s instructions.

WORKMANSHIP

P. FIXING STEEL REINFORCEMENT

Reinforcement shall be bent accurately in accordance with BS 4466 to the shape and dimensions shown in the schedules. All reinforcement shall be bent at temperatures in the range of 5 and 100 degrees centigrade.

Cold worked or any high yield bars shall not be straightened or bent again once having been bent. When it is necessary to bend mild steel reinforcement already cast in the concrete the internal diameter of such bends shall be not less than twice the diameter of the bar.

No welding of reinforcement shall be carried out without the approval of the Engineer. All reinforcement shall at the time of concreting be free from mud, oil mortar droppings, loose rust, paint grease, mill scale or other deleterious still “blue” from the mill shall not be used.

All reinforcement shall be fixed in the position shown on the Drawings by the adequate use of spacers, tying wires, chairs, stools etc., and shall be so maintained during the concreting operations.

Laps in reinforcement shall be where indicated on the Drawings or approved by the Engineer. Unless otherwise indicated the minimum lap length for rod reinforcement shall be 40 diameters and for mesh reinforcement two complete meshes.

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A steel fixer shall be in attendance at all times when concreting is in progress to correct any errors, omissions or movement in the reinforcement.

In severe test conditions reinforcement shall be shaded from direct sunlight and hosed down with clean water prior to concreting to keep the reinforcement below 25 degrees centigrade (77 degrees Fahrenheit).

(a) Nominal Concrete Cover to Reinforcement

Unless otherwise directed the nominal concrete cover to steel reinforcing bars (including links and distribution) in any face shall be:-

Location	Cover Thickness
Foundations against earth face	75mm
Foundation against blinding	50mm
Columns (main bars)	40mm
Slabs and stairs	20mm
Wall (main bars)	20mm

Q. FORMWORK

Formwork shall include all temporary or permanent forms required for forming the concrete, together with all temporary construction required for their support.

All formwork shall be so constructed that there shall be no loss of material from the concrete. After hardening the concrete shall be in the position and of the sample, dimensions, and surface finish described in this specification or on the Drawings.

Where internal metal ties are permitted they or their removable parts shall be extracted without damage to the concrete and the remaining holes filled with mortar. No permanently embedded metal part shall have less cover than that indicated for adjacent steel reinforcement.

When holes are to be provided in formwork for weep holes and the like they shall be neatly trimmed to fit the pipe and caulked with the approved material to form a grout tight joint.

When concrete is to be deposited to a steeper slope than 15 degrees to the horizontal top forms shall be used to enable the concrete to be properly compacted. The Engineer may require details and/or calculations of any proposed formwork to be submitted for approval prior to work starting. Such approval if given shall

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not in any way relieve the contractor of his responsibilities for the safety or adequacy of such for its purposes.

The inside surfaces of forms, except for permanent formwork, or unless agreed by the Engineer, shall be coated with an approved material to prevent adhesion of the concrete. Such approved material shall be applied strictly and shall not come into contact with reinforcement or other cast-in items.

Immediately before concreting all forms shall be thoroughly cleaned out. In the case of deep sections an opening shall be left at the base to enable such cleaning to be adequately completed.

In the case of beams, slabs of like members the formwork shall be so arranged that the sides or edges may be removed without disturbance to the soffit or propping system. The erection, easing and striking of the formwork shall be done under the personal supervision of a competent foreman.

Formwork shall be struck at such a time and in such a manner as to cause no damage to the structure. The contractor shall inform the Engineer before he intends to strike any formwork.

The time at which the formwork is struck shall be the contractor's responsibility but the minimum periods between the completion of any concreting bay and the removal of forms shall be as follows:

Vertical formwork	24 hours
Soffits to beams	28 days
Soffits to slabs	14 days
Cantilevers	21 days

The periods given above are based on the removal of all props and formwork using ordinary portland cement under average weather conditions or different cement may cause the above periods to be increased. Should the contractor wish to make use of reduced striking times then he must satisfy the engineer that the strength of the concrete at such time and the structural system is adequate to withstand the dead and imposed loads applied to it. Before making use of reduced striking times the Engineer's agreement must be obtained in writing.

Where the structure is of multi storey construction props with head trees and braces shall be provided to distribute the imposed load below the floor being cast. This will normally be 2 storey height below the floor being cast unless otherwise stated.

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Where sawn formwork finish is specified or in all cases where no alternative finish is specified the surface of the concrete shall be not worse than that obtained by the use of properly designed moulds of closed jointed sawn boards. Small surface blemishes caused by entrapped air will be permitted but the surface should be free of voids, honeycombs or other defects.

Where “fair faced” finish is specified the irregularities of the finish shall be no greater than those obtained from the use of wrought thickened square edge boards arranged in a uniform pattern. The concrete surface shall be smooth, free from fins, lippings, board marks or other irregularities, and even with sharp true arises. Only very minor blemishes or voids shall occur and there shall be no staining or discolouration. The finish is intended to be left as struck and the only treatment generally permitted is light manual abrasion with a carborundum stone to remove minor marks. Patchint of any description will not normally be permitted.

Where a “fair faced” finish or other finish part from sawn formwork finish is specified the contractor shall provide a sample panel at least

2.4mx1.2m in vertical surface area including a typical horizontal and vertical joint in the shuttering. The sample panel shall be constructed using the system of shuttering and the construction techniques that the contractor proposes for the actual works. The sample when approved will form the standard for the entire works. All unsuccessful samples shall be removed from the site. Should any concrete in the works in the opinion of the Engineer fail to match the standard sample in surface finish then the Engineer may for this sole reason order the removal of all such substandard concrete which shall be replaced with acceptable concrete all at the contractor’s expense.

When the striking of formwork would in the opinion of the Engineer cause damage to or prejudice the safety of the structure the formwork shall be left in. If, in the opinion of the Engineer, the necessity for leaving in the formwork arises from the contractor’s method of working then the cost shall be borne by the contractor, but if it is due to circumstances beyond his control then formwork shall be paid for at rates to be agreed.

R. CONSTRUCTION, CONTRACTION AND EXPANSION JOINTS

Construction joints will be permitted only at the positions shown on the Drawings and as instructed on the site by the engineer. These joints will in general be spaced to allow a maximum plan area for any bay of 100 sq.m. of maximum length of 12 m in any one dimension.

Vertical construction joints shall be properly made to form a vertical grout tight joint. Where reinforcement passes through the face of the joint the stopping off board shall be drilled so that the bars pass through, or the board shall be made in sections with half round indentation in the joint faces for each bar. Under no

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circumstances shall concrete when being deposited be allowed to, tail off. Construction joints formed with expanded metal or similar will not be permitted for reinforced concrete work.

At all construction joints, both horizontal and vertical the surface of the already placed concrete shall be suitably roughened to remove laitance and by exposing the coarse aggregate form a key for adjacent concrete. This work shall be carried out to the satisfaction of the Engineer by the following or other approved method:

- a) After the initial set has taken place but before final set of coarse aggregate shall be exposed by the use of a water jet and brushing
- b) After final set has taken place the laitance shall be removed and coarse aggregate shall be exposed by bush hammering or chiseling.

In both cases the surface is to be thoroughly cleaned after roughening. At least 72 hours shall be left between completion of concreting one bay and the start of concreting any adjacent bay. Contraction joints shall be formed as detailed where shown on the drawings.

Expansion joints shall be formed as detailed at the positions shown on the drawings.

S. CONCRETE MIXES - DESIGNS MIX

Mixes for each class of concrete specified or shown on the drawings shall be designed by the contractor to achieve the specified minimum cube strength combined with high density and adequate workability for the purpose. In order to allow for unavoidable variation the design strength should exceed the specified works cube strength by twice the expected standard deviation. In the absence of previous information a standard deviation of 7MN/M2 should be assumed.

Details of any proposed mix design shall be forwarded to the Engineer not less than 60 days before that class of concrete is required to be used on the work for his approval in principle. The details shall include at least the following information:-

- (a) Source nature and grading of coarse and fine aggregate.
- (b) Source of cement
- (c) Nominal maximum size of aggregate
- (d) Cement content
- (e) Aggregate/Cement ratio
- (f) Water/Cement ratio
- (g) Design density

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- (h) Design slump or compacting factor
- (i) Design strength

Classes of concrete will be referred to by the minimum 28 days work cube strength and the maximum size of aggregate. Classes of concrete shall meet the criteria shown in Table I. The maximum water/cement ratio is herein defined as the ratio of the weight of the “free” water to the weight of the cement. The “free” water is that quality of water available for cement. Any water required to be absorbed by aggregate is excluded.

The workability of the concrete shall be the minimum consistent with producing a dense, well compacted mass. Due regard shall be paid to size and shape of the section together with any congestion of reinforcement.

After the Engineer has approved a design mix in principle the contractor shall prepare a trial mix on site using the plant and materials intended for the works. Each batch of concrete shall be sampled and the following prepared, in accordance with BS1881:

Nine 150 mm cubes, three for test at 7 days, three for test at 14 days and three for test at 28 days; and

- i. Three slump tests or where the design slump is less than 25 mm then
- ii. Three compacting factor tests.

No structural concrete shall be placed in the works until the Engineer has approved the preliminary tests. Thereafter, the approved mix proportions shall be adhered to throughout the work and may only be varied with the prior approval of the Engineer.

T. CONCRETE MIXES - NOMINAL MIXES

Mixes for each class of concrete specified or shown on the Drawings shall be used by the contractor. They shall be mixed to achieve high density combined with adequate workability for the purpose.

Details of any proposed mix shall be forwarded to the Engineer not less than 5 days before that class of the concrete is required to be used on the works for his approval in principle.

Classes of concrete will be referred to by their nominal mix proportions. Classes of concrete shall meet the criteria shown in Table II. The workability of the concrete shall be the minimum consistent with producing a dense, well-compacted mass. Due regard shall be paid to the size and shape of the section together with any congestion of reinforcement. The Engineer may at his discretion require preliminary tests of concrete

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quality for nominal mixes unless satisfactory evidence of strength is produced from reliable sources.

Where required, these tests shall be in accordance with BS 1881.

U. CONCRETE MIXES - GENERAL

The standard of acceptance of any preliminary tests will be similar to the standard for normal works cubes, slump or compacting factor, except that the minimum cube strengths required shall be those given “Minimum Preliminary cube strength at 28 days” in Table I or II.

For all structural concrete the following representative samples shall be taken and tested in accordance with BS 1881. One each day on which less than 50 cu.m of concrete is being poured:

- a) Six 150mm cubes - three for test at 7 days and three for test at 28 days; and
- b) Two slump tests; or
- c) Two compacting factor tests

On any day when greater quantities of concrete are being poured then six additional cube tests and two additional slump or compacting factor tests shall be carried out for each 50 cu.m or part thereof.

All cubes shall be marked with the date of casting and a reference number. For each cube a record shall be kept of the position in which the batch of concrete from which it was sampled was placed. All cubes shall be tested by an approved testing authority.

The concrete cubes tested at 7 days are intended to be indicative only and the target works strengths at 7 days given in Table I are not normally mandatory. It should be noted however, that it is unlikely that cubes failing the 7 days target will subsequently pass the 28 days cube strength. The concrete cubes tested 28 days shall be taken to represent the concrete placed in the works. The standard of acceptance for cube strength tests shall be as follows:

The cube strength shall be calculated from the maximum load sustained by the cube at failure. The appropriate strength requirements as given in Table I, shall be considered to be satisfied if

- a) None of the strength of the three cubes is below the specified cube strength, or if
- b) The average strength of the three cubes is not less than the specified cube strength and the difference between the greatest and the least strengths is not more than 20 percent of that average.

The standard of acceptance for the slump test during the production of concrete shall be the design slump +/- 25mm. The standard of acceptance for the compaction factor test during the production of concrete shall be design compacting factor +/-0.03.

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Any concrete which fail to meet the above standards of acceptance shall be either further tested or condemned at the Engineer's sole discretion. Any such tests or the removal of condemned concrete, replacement and associated costs shall be at the contractor's expense. If the strengths required are not attained or maintained throughout the contract will also be required to redesign the mix and resubmit trial mixes in accordance with clause 04.00 of this specification so as to give a concrete which does comply with requirements of this specification.

Mass concrete shall normally be a 1:3:6 mix unless otherwise specified. Blinding concrete shall normally be a 1:4:8 mix unless otherwise specified.

V. READY MIXED CONCRETE

Ready mixed concrete shall be used only with the approval of the Engineer. When such approval is given it shall be supplied in accordance with BS 1926 except where this conflicts with this specification shall prevail. Truck mixer units and their mixing and discharge performance shall comply with the requirements of BS 4251.

The use of ready mixed concrete shall not relieve the contractor of any of his obligations and the appropriate clauses of this specification shall apply equally to the ready mixed concrete.

Concrete test cubes and slump tests shall be taken on the site at the point and time of discharge in accordance with this specification irrespective of any cubes that the supplier may take at his own works.

W. MIXING AND TRANSPORTING CONCRETE

All materials for concrete shall be measured by weight in approved weight batching equipment. Such equipment shall be checked at weekly intervals at the contractor's expense and shall be accurate to within 2 percent. Certificates of accuracy shall be submitted immediately to the Engineer.

All concrete shall be mixed in approved power driven mixers of a type and capacity suitable for the work. The mixers shall be checked at weekly intervals at the contractor's expense. Certificates of accuracy shall be submitted immediately to the Engineer.

All materials shall be thoroughly mixed before water is added and the mixing of each batch shall continue for a period of not less than two minutes after the water is added or such longer period as recommended by the manufacturer of the mixer. The mixture shall be of uniform colour and distribution on discharge and the entire contents of the mixer shall be discharged before recharging. The volume of mixed material shall not exceed the rated capacity of the mixer.

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Mixers shall at all times be kept in a clean condition. Prior to the first mix each day being agitated in the mixer a rich cement/sand mix shall be used to cast the inside of the drum, the surplus material being emptied away and not used in the works.

The moisture content of the coarse and fine aggregate shall be checked by the contractor at frequent intervals and the amount of water added to the mix adjusted to maintain the design workability. Concrete shall be discharged from the mixer onto a clean, level, water-tight platform or into a clean watertight container. It shall be transported in a manner which ensures that it is of the correct quality and consistency at the point of deposition. All platforms and containers shall be cleaned of the old concrete before the fresh concrete is discharged onto them.

Concrete shall not be dropped from a height, thrown or otherwise treated so that segregation, undesirable finish, or defective structure quality results.

No extra water shall be added to the concrete mix after it has left the mixer. The concrete shall take adequate precautions to protect concrete in transit from the effects of the weather.

Pumping of concrete, which will require a special design mix, will only be permitted with the approval of the Engineer. Should the concreting be stopped due to mechanical malfunction, accident, or other similar cause then the contractor shall inform the Engineer immediately so that necessary measures and precautions can be taken. The cost of any additional work by these stoppages shall be the responsibility of the contractor.

X. PLACING AND COMPACTING CONCRETE

All concrete shall be vibrated unless otherwise specified. The vibration shall be carried out by experienced operators and with immersion type vibrators to the Engineer's satisfaction.

Placing of concrete shall be carried out in layers not exceeding 60mm deep and in sequence from one end of the form to the other. Concrete in foundation and other underground work shall be protected from contamination with fallen earth or rock during and after placing.

Any concrete which shows signs of initial setting before or during placing shall not be used, it shall be removed at the contractor's expense. Sufficient vibrators shall be provided to correspond with the rate of deposition of concrete. The vibration shall be continuous throughout the placing of the concrete. Standby vibrators shall be on site during all concrete placing.

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Vibration must not be allowed to disturb any recently placed concrete that has begun to set. Any water accumulating on the surface of newly placed concrete shall be removed by approved means and no further concrete shall be placed thereon until such water is removed.

Suitable means shall be provided to ensure that the temperature of the concrete on placing does not exceed 30 degrees centigrade (86 degrees Fahrenheit). Concrete shall not be placed around reinforcement or against surfaces which are at temperatures above 30 degrees centigrade (86 degrees Fahrenheit). All surfaces shall be thoroughly damped immediately prior to placing fresh concrete to prevent excessive absorption of water.

Y. UNFORMED FINISHES FOR CONCRETE

Where a concrete surface is specified for receiving a further applied finish or in all cases where no other finish is specified the concrete shall be uniformly levelled and screeded to produce a ridged surface. No further work shall be applied to the surface.

Where a concrete surface is specified as exposed with no further applied finish the concrete shall be uniformly levelled and screeded to produce a plain surface. After the concrete has hardened sufficiently, the surface shall be hand or machine floated sufficiently only to produce a uniform surface free from screed marks.

Z. CURING AND PROTECTING CONCRETE

Immediately after compacting and for 7 days thereafter concrete shall be protected against harmful effects of weather including rain, rapid temperatures changes, and from drying out. The methods of protection used shall be subject to the approval of the Engineer. The method of curing used shall prevent loss of moisture from the concrete. During the curing period horizontal surfaces shall be protected by the following or other approved means:

- a) Covering with damp hessian canvas sacks or similar absorbent materials kept constantly damp and wholly covering the exposed concrete surface.
- b) Covering with an impermeable material raised approximately 50mm over the surface so to prevent loss of moisture
- c) An approved membrane curing compound.

During the curing period other surfaces shall be protected by the following or other approved means:

- a) Formwork in close contact with the concrete but kept cool at all times.
- b) Direct and continuous application of water preferably in the form of mist so as not to damage the surface.

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- c) Covering as (a) to (c) above

All concrete faces or edges, particularly those which are exposed without rendering in the final structure, shall be adequately protected from damage and discolouration at all times.

Concrete structures shall not be loaded until the concrete is at least 21 days old or 28 days in the case of cantilevers. With the prior approval of the Engineer the structure may be loaded after this time but in no case will loading greater than the final design loading be permitted.

AA. TOLERANCE

All in situ concrete work shall be dimensionally accurate to within the following tolerances:

- a) Between the centre line of principal members columns or beams

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

+/- 10mm over 15 metres c/c

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

- b) In storey height

+/- 5mm floor to floor.

- c) In plumbness of columns and walls

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

- d) In level of floors

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

- e) In cross sectional dimensions of column beams and walls +5mm/-3mm in any dimension up to 2 metres overall

- f) Cover to reinforcement

+5mm/-0 of the stated covers

BB. MISCELLANEOUS ITEMS

Holes, chases, indentations and the like shall be provided where indicated on the Drawings. All such shall be formed in the concrete and not cut after the concrete has hardened.

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Should the contractor or any sub-contractor require additional hoses or the like these requirements shall be submitted to the Engineer for his approval prior to concreting.

Pipes, conduits, fixing bolts and other such cast-in items shall be provided where indicated on the Drawings.

Should the contractor or any sub-contractor require additional cast-in items these requirements shall be submitted to the Engineer for his approval prior to concreting. Hollow pots shall be laid in the position shown on the Drawings, care being taken to ensure that the units maintain the full specified rib widths throughout. The gaps between adjacent units shall not exceed 3mm.

CC. PRECAST CONCRETE

The materials for precast work shall be similar to the materials for in situ work. The workmanship for precast work shall comply with

CP 116 except where this conflicts with this specification when the specification shall prevail.

The contractor shall prepare, for each type of precast unit, a drawing indicating his proposed formwork construction, casting methods, de-moulding and handling procedure for the Engineer's approval.

Moulds and formwork shall be so constructed that the dimensions of the finished concrete members are within the specified permissible tolerance given clause 407 of CP 116: part 2:1969.

Where precast concrete is described as "fair faced" the mould shall be of metal, or are to have metal or hardboard linings, or are to be other approved moulds which will produce a smooth, dense fair face to the finished concrete and free from all shutter marks, holes, pitings, etc.

Precast concrete shall be made of the mixes described on the drawings in suitable moulds, true in form to the shapes required thoroughly tamped into the moulds and around reinforcement and vibrated. All precast work shall be carried out under cover and the period before removal from forms and the period of storing shall be determined and agreed by the Engineer and contractor with due regard to the type of unit, i.e. load bearing or non-load bearing, difficulties of casting, projections, holes and other points which require particular attention.

The method of lifting, position of lifting points and curing time before lifting shall be agreed with the Engineer before casting of any units.

Extreme care should be taken when handling precast units and any units damaged during the transporting and/ or positioning shall be replaced at the contractor's expense.

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DD. CONCRETE FOR WATER RETAINING STRUCTURES**

Concrete and its constituents for water retaining structures, in addition to the general and particular provisions in this specification shall comply with the following requirements in this section. In addition to the requirements of clause 4.5 aggregates for concrete in water retaining structures shall have a low drying shrinkage and absorption, as measured in accordance with BS 812 not greater than 3 percent. The Engineer may before approval is given to an aggregate or at any time thereafter require that the aggregate be tested for absorption in accordance with BS 812. Any aggregate failing to comply with this specification will be rejected.

In addition to the requirements of clause 4.20 concrete for the water retaining structures shall have a maximum cement content of 400 kg/m³.

Blinding concrete under water retaining structures shall be a maximum of 75 mm thick and shall be in class 15/40 concrete.

Class 15/40 concrete shall comply with the following requirements:- Minimum works cube strength at 28 days **15MN/M²**

Maximum size of aggregate 40mm

Mix proportions 1 cement:2.5 fine aggregate:

5 coarse aggregate

This is a nominal mix and no cubes will be required to be taken.

For water retaining structures the provisions of clause 4.19 paragraph are modified. The construction joints will in general be spaced to allow a maximum plan area for any bay of 40 sq.m or maximum lengths of 7.5m in any one dimension.

For water retaining structures the provisions of clause 4.19 paragraph five are modified. At least 96 hours shall be left between completion of concreting one bay and the start of concreting any adjacent bay.

A kicker of minimum height 150mm shall be cast integrally with the base slab for all water retaining structures.

The surface of all concrete for water retaining structures shall not be permitted to dry out even after the 7 days curing period specified in clause 4.27.

All pipes passing through concrete walls or slabs for water retaining structures shall be cast in at the time of concreting and not subsequently fitted. All such pipes shall be provided with a puddle flange fitted to form a seal against the pipe and of an outside diameter 20mm greater than the outside diameter of the pipe.

Joint sealants shall be applied not less than 7 days after completion of the structure.

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On completion of the water structure at a time decided by the Engineer it shall be tested for water-tightness in the following manner. Structures which are elevated shall be filled at a uniform rate not exceeding 1 metre rise in head per 24 hours and allowed to absorb water for 3 days. After this period the water level shall be brought up to the top water level and left for 7 days. During this period the exposed faces shall show no sign of leakage and shall remain apparently dry. Structures founded on or in the ground shall be tested prior to backfilling unless otherwise stated. The structure shall be filled as specified above. After filling to top water level no further water shall be introduced for the next 7 days. The structure will be deemed to be watertight if at the expiration of this time the total drop in surface level does not exceed 10mm after making due allowance for evaporation and absorption and no signs of leakage are observed. Water for testing shall be provided at the contractor's expense.

If the structure fails the test above any defects shall be made good or such taken to eliminate leakage as the Engineer shall direct. All such work shall be at the contractor's expense.

After completion of any repairs the structure shall be retested using the procedure specified above.

Swimming pools should be tested prior to applying internal finishes.

(a) Precast Concrete

General

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

The maximum size of coarse aggregate concrete shall not exceed 20mm except for thickness less than 75mm where it shall not exceed 10mm.

The compacting of precast concrete shall conform with requirements given elsewhere in these preambles except for thin slabs where use of immersion type vibrators is not practicable. The

Concrete in these slabs may be consolidating 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 materials 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 subject 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 an direction shall be subject to the approval of the Engineer, providing that

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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.

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

Where precast work is described as "fair face" the moulds are to be made of metal or are to have metal or plywood linings or are to be other approved moulds which will produce a smooth dense fair face to the finished concrete suitable to receive a painted finish direct and free from shutter marks, holes, pitting, 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. Where precast work is to have an "exposed aggregate" or terrazzo finish the moulds shall be constructed to the requirements given for moulds "finished fair" work. The method of achieving the exposed aggregate finish shall be "aggregate transfer" or other approved method.

(b) Precast Concrete Cladding Units

These shall be cast to the general details shown on the drawings. The Contractor shall submit working/shop drawings for each type of the cladding panels to the Engineer for approval before he commences casting operations

The panels shall be cast in special yards and shall be cured adequately before being hoisted into position in the structure, taking care that no parts are broken in the process. The units shall then be joined together with insitu concrete and flexibility connected to the top and bottom beams to allow for limited movement of the combined unit.

(c) Hollow Block Suspended Construction (Composite Floor Slab)

Concrete hollow blocks for use in the composite floor slabs shall be of the standard sizes required or as shown on the drawings 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. 6073 and to be of a mix not weaker than 1:4:8 cement: sandstone using maximum 10mm 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 cement.

Hollow clay filler blocks for use in the composite floor slabs are to be of the sizes shown on the drawings and to be of adequate strength to support the concrete during placing and consolidation by vibration. They shall be obtained from an approved manufacturer. Before any orders are placed, at least 6 sample clay blocks

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shall be provided for the approval of the Engineer. Any clay blocks subsequently delivered to site which in the opinion of the Engineer are not of equal standard to the approved samples shall be rejected.

Rejected blocks shall immediately be removed from the site and shall not be used in the works. Clay blocks are to be fully cured before delivery or use on site.

Clay blocks are to be well wetted before pouring of concrete.

(d) 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 Soffits 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 0.2 m Centres. Care must be taken during concreting that the reinforcement is not displaced.

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

Prices for such holes through block construction are to include the rearrangement or substitution of the hollow block with solid concrete in addition to the actual formation of the hole.

PART FIVE

WALLING SPECIFICATIONS

MATERIALS

A. CEMENT

Cement used for making mortar shall be as described in concrete work.

B. LIME

The lime for making mortar shall be obtained from an approved source and shall comply with BS 890 Class A for non-hydraulic lime. The lime to be run to putty in an approved lined pit or container. The water to be first run into the pit or container and the lime to be added until it is completely submerged, stirred

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vigorously until all lumps are disintegrated and shall be kept constantly covered with water and regularly stirred for at least four weeks. The resulting milk-lime then to be through a fine sieve and run into a pit or other container and kept clean and moist for not less than two weeks before being used in the works and moist for not less than two weeks before being used in the works.

C. SAND

Sand used for making mortar shall be clean well graded siliceous sand of good sharp hard quality equal to samples which shall be deposited with and approved by the Architect. It shall be free from lumps of stone, earth, loam, dust, salt, organic matter and other deleterious substances, passed through a fine sieve and washed with clean water if so directed by the Architect.

D. WATER

Shall be as described in “concrete work”.

E. CONCRETE BLOCKS

Concrete blocks shall comply with the requirements of BS 2028, 1384 except where amended or extended by the following clause. Blocks shall have square arrises and corners. For fairfaced work damage to arises and corners shall not exceed the removal of 6mm of the blocks depth or thickness.

Concrete blocks shall have a minimum crushing strength of 3.5 N/mm² except when below the damp course level or in contact with soil when they shall have a minimum crushing strength of 7 N/mm², unless noted otherwise on drawings.

Hollow concrete blocks shall not be used below the damp course level or in contact with soil.

Concrete blocks used for external walls shall be class ‘A’ and for internal load bearing walls they shall be at least Class ‘B’. Class ‘C’ blocks shall only be used for non-load bearing partitions.

No precast blocks shall be incorporated into the work unless approved by the Architect. The delivery of present blocks from which samples tested do not comply with this specification shall be deemed defective. Any work constructed with blocks from which samples tested do not comply with this specification shall be deemed to be defective.

From every 1,000 precast concrete blocks delivered to site ten blocks samples shall be provided for testing. The precast block samples shall be selected in accordance with BS2028, 1364. Samples of precast concrete blocks for testing shall be tested for the following properties in accordance with the methods given in BS

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2028, 1364 and the test results shall comply with the requirements of BS 2018, 1364 except where amended by this specification:-

- (a) Drying shrinkage
- (b) Compressive strength or transverse breaking load (as applicable)
- (c) Wetting expansion*
- (d) Density
- (e) Dimensional Tolerance
- (f) Cavity size

*Test only applicable for concrete blocks made with clinker aggregate.

Blocks shall also be tested to determine the suction rate. The test shall consist of weighing the block, placing in a tray of water such that only 3mm of the block side is immersed for a period of sixty seconds +/- 2 seconds; quickly wiping off excess water and reweighing. The suction rate is the increase in weight due to water absorbed and shall not exceed 2 kg/m²/minute. Blocks which have a suction rate exceeding 2kg/m²/minute may be used if the contractor uses an approved water reactive additive in the mortar or can show that the blocks will have a suction rate not exceeding 2kgm²/minute for a period of 24 hours from being laid and provided the blocks comply with all other requirements.

Concrete blocks shall be stacked on prepared dry areas free of clinker, ashes and sulphate bearing strata. Blocks of different strengths shall be stacked separately and clearly marked to differentiate the strengths. Blocks shall not be used for a minimum of 7 days after manufacture and shall not be loaded for at least 14 days after laying. For the first 7 days after manufacture, block shall be cured by maintaining in a damp condition, e.g. covering with polythene sheeting after wetting blocks.

F. HOLLOW CLAY BLOCKS

Hollow clay partition blocks shall comply with the provisions of BS 1190 section 1 and are to be hard, well burnt, true to size and shape and with sharp arrises and keyed faces and joints are to be obtained from an approved manufacturer and to be equal in every respect to a sample to be deposited with, and approved by the Architect.

Blocks are to be 190 mm high (to give 200mm height including the joint) and of the thickness given herein. Cutting of blocks is to be avoided wherever possible and full use is to be made of quarter, half and three quarter blocks, and blocks with conduit recesses.

G. LOUVRE BLOCK WALLING

i) To be precast concrete mix 1:1.5:3 or 25N/mm² (12mm aggregate) but with 10mm finished fair on all exposed surfaces, built in cement and sand (1:5) mortar with straight horizontal and vertical joints to flush pointed both sides.

ii) Each block to be size 200mm x 400mm x 200mm high and consisting of two ends each 200m x 200mm x 50mm thick joined with a 50 mm thick twice cranked louver with top end of louver projecting 40mm above top of block..

H. STONE

All stone shall comply with the requirements of CP121.202 for masonry and rubble walls respectively except where amended or extended by the following clauses.

Unless otherwise noted, all masonry walls shall be course squared rubble walling with mortar joints. The size of stones for rubble walling shall be such that the length of stone does not exceed three times its height. For coursed squared rubble walls block shall not exceed 300 mm in height and shall be not less than 150 mm in height.

Where sneaked rubble walls are specified; the snecks shall not be less than 100mm square on the exposed face. Stone for masonry shall have a minimum compressive strength of 10 N/mm². (stone shall not be required to be tested to failure). The density of stone for masonry shall be not less than 230 kg/m³. The drying shrinkage of stone shall not exceed 0.05%.

Samples of stone provided for testing shall be tested for the following in accordance with the methods given in Bs 2028, 1364 and the test results shall comply with the requirements of this specification.

- (a) Compressive strength
- (b) Density
- (c) Drying shrinkage

The colour and texture of stone shall be uniform and consistent. Prior to delivering any stone to site the contractor shall supply the Architect with a sample of stone in order that he may approve the colour and texture. The contractor shall ensure that sufficient suitable stone is available for the whole of the project prior to ordering the stone.

Where cast stone including described as artificial stone, reconstructed stone, etc., is specified the stone shall comply with the requirements of BS 1217. Masonry shall be of stone, having no irregular faces and only the back face if not visible shall be left as from the saw.

Prior to ordering dry stone the contractor shall demonstrate that the stone is durable. This may be done by supplying details of building constructed with stone from the same quarry and which has been exposed to the same environment condition for at least ten years. The maximum projection from the face of stone for rubble walls shall be 20mm beyond the specified face of the wall.

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The contractor shall provide six samples of stone measuring 150mm x 150mm for testing prior to delivering any stone to site. As work proceeds the contractor shall provide six samples 150 x150 x 150mm for testing from every 300m² of work. All stone shall be stacked on prepared dry areas free of clinker, ashes and sulphate bearing strata.

I. WALL REINFORCEMENT

Where described walls and partitions shall be reinforced with a 25mm wide strip of No.20S.W.G hoop iron built into alternate horizontal joints in the wall centre. The reinforcement shall be lapped and hooked at running joints, angles and intersections and carried at least 115mm into abutting walls at junctions.

J. WALL TIES

To be 3mm diameter galvanized mild steel wire twisted butterfly wall ties

K. DAMP - PROOF COURSES

The bituminous felt sheeting for damp-proof courses shall be hessian based bituminous felt complying with BS743 TYPE 4A weighing not less than 3.85 Kgs per square metre. The sheeting is to be lapped 150mm at running joints and the full width of walls at angles.

WORKMANSHIP

L. CEMENT MORTAR

Mortar described as cement mortar 1:4 shall be composed of 1 cubic metre (1498 Kgs) of Portland Cement and 4 cubic metres of sand. Other mixes such as 1:3, 1:5 etc. shall be similarly construed.

M. MIXING MORTAR

The constituent materials shall be measured separately when dry in specially prepared gauge boxes of sizes to give the proportions specified without consolidation of the contents by ramming and shaking. The mortar shall be mixed in an approved power driven mixer for not less than two minutes per batch and using the minimum quantity of water necessary to obtain a working consistency. The mixer shall be used as close as practicable to the works and mortar shall be used within 30 minutes of mixing. No partially or wholly set mortar will be allowed to be used or re-mixed.

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N. GENERAL CONSTRUCTION

(a) *Setting out*

The contractor shall provide proper setting out rods and set out all work on same for course, openings, heights etc., and shall build the walls, piers etc., to the widths, depths and heights indicated on the Drawings and as directed by the Architect.

(b) *Building in Wood Frames*

Openings for doors, ventilators etc., are to be set out and left unbuilt until the wooden frames have been fixed in position.

(c) *Building in Metal windows and doors*

Openings for metal frames to be wide enough for the frames to fit without being forced into position. Build the lugs into the joints of the walling and fill into the space between the walling and frames with cement mortar well tamped into the channel of the frames and point all round externally.

All frames must be set plumb and level and free from twist.

(d) *Walls to Receive Plaster & Similar Finishes*

All faces of walls to be plastered etc., to have all projections dressed off and joints raked out as key.

O. BUILDING WALLING

(a) *Laying and Jointing*

All blocks shall be well wetted before being laid and the top of walling where left off shall be well wetted before commencing. Walls to be kept wet three days after building. All walls throughout the works shall be carried up evenly in

200mm courses except where courses of less depth are required to bring walling up to level of floors, windows and the like and where otherwise described, no part being allowed to be carried up more than one metre higher at one time than any other part and in such cases the joining shall be made in long steps so as to prevent cracks arising and all walls shall be levelled round at each stage. Not more than 3 metres height of wall shall be laid in any one day.

(b) *Bonding*

The blocks shall be properly bonded together and in such a manner that no vertical joint in any one course shall be within

115mm of a similar in the courses immediately above or below. All walling of 300mm thickness or less shall be built in single thickness of blocks. Walling exceeding 300mm in thickness shall be built with through bonders not more than

1070mm apart in each course as directed by the Architect.

Alternate courses of walling at all angles and intersections shall be carried through the full thickness of the adjoining wall. All perpend, reveals and other angles of the walling shall be built strictly true and square.

(c) Tolerances

All courses of walls shall be level with a maximum deviation of +/- 3mm in any one metre length and a maximum overall deviation on 10mm for lengths of wall exceeding 3 metres. Walls shall be plumb with a maximum deviation of +/- 3mm in any metre height of wall with a maximum deviation of +/-10 mm in the total height of the wall or any storey.

All corners of walls which are shown as being at right angles shall be square with a maximum deviation of 3 in 1000. All walls should be straight with a maximum deviation of +/-3mm in any one metre length and a maximum overall deviation of

10mm in any length exceeding 3 metres.

All bed and vertical joints shall be an average of 10mm thick with a maximum deviation of +/-3mm of blockwork, and stone rubble walls. Joints for stone masonry walls shall be 6mm +/- 1 mm thick.

(d) Curing

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

(e) Cavities

Cavity walls shall be of the overall thickness shown on the drawings.

Cavities above ground level between leaves of block or masonry shall be free of mortar droppings or other debris. The Contractor shall take proper precautions to prevent mortar or debris entering the cavity.

Cavity below ground level shall be filled with mortar for cavities up to 75mm wide and for cavities over 75mm wide filling shall be concrete mix 1:3:6. Cavities shall be filled such that there is maximum of three times the thickness of the thinner leaf of the wall filled with wet mortar or concrete unless the wall is continuously supported for the depth.

(f) Backfilling

Earth backfilling against walls shall be carried out such that the level of the backfill is always equal on each side of the wall. When a wall has filling material on one side only to a fill width of more than three times the wall thickness, the wall shall be continuously supported during backfilling.

Backfilling shall not be carried out until at least seven days have elapsed since the laying of the blocks or stone.

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(P) REINFORCEMENT WALLS

Steel reinforcing bars in walls shall be carefully placed and spacers used to ensure that a minimum of 20mm cover is given to the reinforcement unless otherwise specified.

Horizontal reinforcement in mortar joints shall be laid such that the reinforcement is not contact with the blocks or stone.

Q. WALL TIES

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

Walls ties shall be provided at 450mm centre both vertically and 900mm centres horizontally and shall be staggered when used to connect two leaves of unbonded wall. Wall ties shall be embedded to each material by a minimum of 50mm.

R. FAIR FACE

All concrete and hollow clay blockwork described as finished with a fair face is to be built to a true and even face with the joints finished as specified hereinafter.

S. POINTING

Pointing of walls shall be carried out as the work proceeds wherever possible. When coloured mortar is specified for pointing only the pointing shall be carried out after work has been completed.

Existing walls shall be prepared for pointing by raking out all loose friable material to a minimum depth of 15mm to form a square recess. The joints shall then be wetted and new mortar shall be forced into joints and finished as directed.

T. HOLES, CUTTING AND CHASING

(a) All putlog holes shall be not 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 faced walls to match facing.

(b) Where walling is cut, holed or chased for conduits, pipes and the like all such cuttings etc., shall be filled in solid with cement mortar (1:4) prior to the application of finishes.

PART SIX

ROOFING, WATERPROOFING & RAIN WATER PIPES SPECIFICATIONS

ROOFING, WATERPROOFING & RAIN WATER PIPES

A. TILE ROOFING

(i) Tiles are to be uniform in size and shape, free from cracks, twists and other blemishes and are to be true after fixing on the roof.

(ii) Unless specified all tile battens are to be 50 x 25 mm fin sawn celcured Podo Carpus or Cypress continuously and securely spiked at ratters at such centres up the roof to suit the pitch of the tiles. (In addition Roman tiles Roofs are to have 75 x 50 mm counter battens to suit).

(iii) Mangalore, Brosley, Roman and Pan tiles are to be purchased from Clayworks Ltd. Cement tiles shall be purchased from Manson Hart Limited and Mareba Enterprises Limited or any other approved manufacturers and shall be laid in accordance with the manufacturer's instructions and shall be completed with left hand verge tiles and fascia tiles nailed to battens. At the ridge provide and lay 300mm wide felt under the socketless ridging which shall be matching tinted pointed with oxide purchased from the manufacturer.

(iv) Where valley tiles are specified, these shall be laid in accordance with manufacturers instructions and the roof tiles to be cut shall be marked by the Contractor, transported to and from the factory where they are to be cut and re-tinted by Manson Hart Limited or Mareba Enterprises Limited before fixing on site.

B. POLYTHENE UNDERFELTING

500 Gauge polythene underfelting is to be provided to all tile roofs and fixed under roofing battens with 150mm laps.

C. ASPHALT ROOFING

Asphalt roofing will be executed by an approved specialist roofing sub-contractor. Before any application of roofing the contractor is to ensure that all roof surfaces are thoroughly cleaned by sweeping.

Roofing asphalt to be BS 988/1966 Table 3 COLUMN 111 Tropical Mastic asphalt laid in two coats to a total thickness of 20mm on and including black sheathing felt, and finished with either three coats aluminium paint to horizontal and vertical surfaces local grey stone chippings or precast concrete paving slabs as necessary.

The first layer of asphalt to be fully bonded to the sheathing felt and the second layer to be laid with a 75mm joint to the first layer. At all junctions of covering with parapet walls, kerbs, eaves, gutters etc., the asphalt is to be turned up a minimum height of 150mm with an angle fillet at the junction with the roof covering and splayed at the tip and tucked 25mm into groove and pointed in cement and sand.

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Precast concrete tiles are to be 300 x 25mm thick, interlocking, finished fair on exposed face and bedded in bitumen and pointed in cement mortar.

D. COLAS ROOF AND PLANTING BOX WATERPROOFING SPECIFICATION 7.01

Colas roof and planting box waterproofing shall be obtained from colas East Africa Limited and laid in accordance with the manufacturer's instructions to the approval of the Architect. Surfaces shall be prepared in the following manner:-

- a) Lay 60mm faced triangular fillets at all internal wall to roof intersections using a mortar comprised of 1 volume of colmastic 30.01 and 2 volumes of sand.
- b) Parapet walls and other vertical surfaces must be smooth. Brickwork shall be flush pointed or rendered with a cement/sand mix, to a height of 250mm.
- c) Rain water outlets shall be fixed firmly to but below the level of the roof slab. They should be free to move independently of the downpipe.
- d) When the concrete and/or mortar applications are set and dry, brush the surface free of all dirt, dust, laitance and loose materials. Apply, by brush or spray, a coating of colasprime 80.05 and allow this to dry.
- e) Day work joints, shrinkage cracks or fillets shall be treated by applying a heavy coat of colaskote 70.02 into which should be embedded a strip of colas membrane 88.08, free of wrinkles. This strip shall extend, in width, 80mm on both sides of the joint/fillet being treated. A further coat of 70.02 shall be applied over the 88.08 and allowed to dry.

Colas waterproofing shall be applied as follows:

- i. Apply heavy brush of colaskote 70.02 0.75 litres per sq. metre laid on in one direction.
- ii. Allow to dry.
- iii. Apply a further heavy brush coat of colaskote 70.02 laid on right angles to the previous coat, and whilst this is still wet, embed a layer of colas membrane 88.08. (Note: Edges of the membrane should be overlapped by 80mm. Allow to dry.
- iv. Apply a heavy brush coat of colaskote 70.01 laid on at right angles to the previous coat.
- v. Allow to dry

Colas roof waterproofing shall be finished with two coats colaskote 71.04 aluminium reflective paint. The first coat shall be allowed to dry before application of the second coat. Before application of the first coat of reflective paint the colaskote waterproofing shall be dusted with a clean, sharp, fine sand whilst still wet and excess sand thoroughly brushed off when the emulsion is dry.

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E. COLAS BASEMENT TANKING SPECIFICATION 7.04

Colas basement tanking shall be obtained from Colas East Africa Limited and applied in accordance with the manufacturer's instructions to the approval of the Architect.

Surfaces to receive tanking shall be level with no sharp points, edges etc., and shall be clean to receive the tanking

Colas tanking shall be applied in the following manner:-

- i. Check the surface to ensure it is smooth and clean.
- ii. Apply a prime coat of colasprime 80.05 at the rate of .15 litres (concrete) per square metre.
- iii. Apply a coat of colaskote 70.02 at the rate of .75 litres per square metre and allow to dry
- iv. Apply a further coat of 70.02 at .75 litre per square metre.
- v. Into this apply open weave glass membrane of colas membrane 88.08 and ensure that the edges are overlapped at least 500mm and the membrane is well brushed out to give no wrinkles in the finished surface.
- vi. Over the dried film apply a second coat of 70.02 as in (d) and repeat (c)
- vii. Apply a towel coat of colaskote 70.03 at the rate of 3 litres per square metre.
- viii. Over the finished waterproofing membrane provide a protective coating consisting of colmastic 30.03, 1 volume 30.02 and 2 volume sand 6mm thick..

F. CEDAR SHINGLE ROOFING

Cedar shingle roofing shall be obtained from an approved supplier to the approval of the Architect.

Shingles shall be 75mm wide x 400mm long x approximately 12mm thick or other size approved by the Architect. Prior to fixing shingles shall be well soaked in engine oil to the approval of the architect.

Shingles are to be fixed to 38mm x 25mm treated sawn cypress battens with 2 No. 32mm long rust resistant nails (hot dipped zinc, copper or aluminium) in each shingle. Each nail is to be positioned 20mm from the side edge of the shingle and 38mm above the butt line.

Shingles shall have a 5mm space between adjacent shingles and joints in any one course shall be separated not less than 40mm from joints in adjacent courses. Each shingles have an exposure of 125mm.

G. BITUMINOUS FELT ROOFING MATERIALS

(a) Fibre based bitumen felt shall comply with BS 747: part 2,class 1:

Type of felt	Nominal weight/10m2
1A Saturated bitumen	7kg
1B Fine	17kg
	T& SP/41

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1C self finished bitumen	13kg
1D coarse sand surfaced bitumen	20kg
1E mineral surfaced bitumen	36kg

(b) Asbestos based bitumen felts shall comply with BS 747 part 2, class 2:

Type of felt	Nominal lweight/10m2
2A saturated bitumen asbestos	7kg
2B Fine sand surfaced bitumen asbestos	16kg
2C self finished bitmen asbestos	13kg
2E mineral surfaced bitumen asbestos	36kg

Unless otherwise specified bituminous felt roofing shall comprise the following layers:

(a) To main roof areas

First layer: saturated bitumen asbestos felt Type 2A, partially bonded. Second layer: self-finished bitumen felt Type 1C, fully bonded.

Third layer: mineral surfaced bitumen felt to be aluminium cap sheet finish, fully bonded.

(b) To gutters and upstands in felt roofs:

First layer: saturated bitumen asbestos felt Type 2A, fully bonded Second layer: self-finished bitumen felt Type 1C, fully bonded Third layer: mineral surfaced bitumen felt Type 1E, fully bonded.

H. LAYING

Bitumen felt roofing work must be carried out by a sub-contractor approved by the Architect. Laying of the felt is to be carried out generally in accordance with C.P 1441.101 to the following minimum falls.

(a) for mineral surfaced felt roofs	1:30
(b) for protected felt roofs	1:60

The contractor sand sub-contractor shall ensure that the roof screed is laid to the correct falls before applying the roofing felt. Before laying covering the contractor shall ensure that all preceding and preliminary work, including all pipes and outlets passing through the roof, formation of grooves and chases, and provision of battens and fillets is complete.

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Base sheeting is to be laid on a clean, dry base and before work commences the contractor shall obtain the roofing sub-contractor's written agreement that the base is suitable. Sheeting shall be laid in the following manner:

- a) Nail underlayer at 75mm centres at tops of sloping roofs and screeds.
- b) Hot bonding compounds shall be prepared as follows:
 - i. Heat in kettles fitted with a thermometer.
 - ii. Do not heat to more than 220 degrees C.
 - iii. Lay at 200 degrees C.
- c) Partial bonding of first layer shall be carried out by spot, strip or frame bonding at centers not exceeding 1800mm with hot bonding compound to the approval of the Architect. Fully bond at perimeter of roof for a width of 450mm, leaving ventilation channels 150mm wide at approximately 1800mm centers.
- d) Full bonding of second and subsequent layers shall be carried out by applying hot bonding compound to the previous layer, lay bitumen felt and apply pressure to ensure a firm bond. Remove the surplus squeezing out compound as the work proceeds. Compound should be applied at a minimum rate of 16kg per 1.0m². Precast adhesion of squeezed-out bonding compound to the surface of mineral-surfaced felt.
- e) Sheets shall be laid in the direction of the roof slope with a 50mm side and 75mm end lap
- f) Upstands must be at least 15mm high, fully bonded to the structure with tip edge tucked into chase, wedged at 600mm centers and fully bond to upstand. Each lap shall be 100mm and sealed with hot bonding compound. Chases shall be pointed in cement-sand mortar 1:3
- g) Unless otherwise specified eaves shall be formed as follows:
 - i. Nail one edge of 200mm felt strip at 150mm centers
 - ii. Fold to form welt 50mm deep and seal with bonding compound.
 - iii. Fully bond remainder of felt to base and cover with full thickness of built up finish.

I. ASBESTOS CEMENT SHEETING

Corrugated asbestos cement sheeting shall be obtained from an approved manufacturer by Simbarite Limited, P. O. Box 90662, Mombasa, Kenya. The sheeting shall be of an even colour, free from cracks, chips and other defects. Roofing is to be complete with all hip and ridge coverings as supplied by the manufacturer and is to be fixed in strict accordance with their instructions, including galvanised screws of crook bolts and washers.

J. GALVANIZED CORRUGATED IRON SHEETS

Galvanised or pre-painted corrugated mild steel sheets for roofing and cladding shall be of the gauge and profile required, and obtained from an approved manufacturer. They shall be fixed with approved crook bolts, washers, etc., to 'Z' purlins.

K. TIMBER ROOF TRUSSES

All timber to be used shall be as described in carpentry and Joinery hereafter.

Roof construction is to include for all necessary timbers, dragon ties, ridges, hips, purlins, valleys, eaves, timbers, etc., and for any eaves soffits, fascias, gangboards as specified or shown on the Drawings.

Generally trusses are to be set vertical and level, spiked to wall plates and secured with the wall ties.

No timbers used for ties, rafters or purlins shall be over 5.0 metres in length. All joints shall be scarfed and bound with continuous

20 mm hoop iron binding, pitched at 35mm centres scarfs in purlins shall occur at trusses but in ties and rafters they shall occur approximately central between joints. The prices for roof trusses shall include for all the foregoing and nails, bolts, etc., necessary to make the required joints.

L. ALUMINIUM FLASHINGS

Aluminium flashings shall be formed out of 22 gauge super purity aluminium with natural mill finish to BS 1470. Where flashings are built into joints or tucked into grooves the minimum depth is to be 25mm and they are to be secured by folded aluminium wedges at 450mm centres and pointed in cement mortar (1:3).

M. ROOF SCREED GENERALLY

Roof screeds are to be laid to a minimum fall and crossfall of 27mm in 3.0 metres with a minimum thickness of 19mm at rainwater outlets and are to be finished to the entire satisfaction of the sub-contractor executing the roofing.

N. CEMENT AND SAND ROOF SCREEDS

The roof screeds shall be formed of cement and sand (1:3). The screeds shall be laid in bays, square where possible, of maximum 10 square metres. Each bay shall be formed between stop boards of the correct height and cut on each side to indicate the slope required in the roofing. The screed shall be trowelled with a wood float to true and accurate falls or crossfalls up to the stop boards. A 10mm wide gap shall be left between each screed bay for the full depth of the screed. The screeds shall be allowed to cure thoroughly to attain maximum shrinkage. Any cracks which appear due to shrinkage shall be made good. The gaps between the screed bays shall be filled as follows:

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- i. Brush or blow out joints to remove dirt, dust, etc., and prime the sides of the joints using a piece of sponge or similar dipped in a mixture of equal volumes of Flintkote./ Type 1 Type 3 emulsion and water. Allow to dry.
- ii. Fill up joints slightly round on the surface using a 1:2:3 mastic. This mastic shall be prepared by mixing one volume of cement with volumes of sand, adding a little water to dampen the mix, then adding two volumes of Flintkote. Type 1 or Type 3 emulsion. The mastic is thoroughly mixed together adding further water as necessary until it is a uniform brown colour, without being too sloppy. Allow to set and dry. The screed joints shall then be covered with a 200mm wide strip of building paper not bonded to the screed joint and well lapped at angles and junctions before the application of the roof covering.

O. LIGHTWEIGHT ROOF SCREEDS

Lightweight roof screeds shall be composed of bases of cement, sand and pumice (1:4:8) finished with a 12mm cement and sand (1:5) topping laid whilst the base is still green and trowelled smooth to the satisfaction of the Architect. The screeds are to be laid as described in 'cement and sand Roof Screeds.'

P. PVC RAINWATER PIPES

PVC rainwater pipes and fittings are to comply with BS 4576 with solvent welded or rubber ring seal joints. Pipes are to be case into concrete or to be fixed to the structure with PVC holder bats built-in or plugged and screwed at maximum 2 meter centers.

Bends, swan necks, discharge chutes and fittings generally are to be fixed where necessary to facilitate the flow of water. Rainwater outlets shall be PVC suitable for the roof finish in which they occur with domical PVC grating.

Q. PROTECTION

The contractor is to take all necessary precautions to protect the finished work and must ensure no damage occurs to the roofing until completion of the works.

R. COMPLETION OF THE WORKS

On completion of the works, the contractor shall clear away, ensure that rainwater outlets are clear and generally leave the roof areas in a clean and watertight conditions to the satisfaction of the Architect.

PART SEVEN

CARPENTRY & JOINERY SPECIFICATIONS

CARPENTRY & JOINERY

A. GENERALLY

All woodwork shall be carried out in accordance with the drawing and the principals of first class joinery construction. Unless specifically stated otherwise, sizes shown on drawings are finished sizes and the contractor must allow for wrot faces.

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MATERIALS**

B. QUALITIES OF TIMBER

- i. The qualities of timber stated hereinafter are in accordance with the latest Kenya Government Grading Rules.
- ii. All timber described as prime Grade is to be first Grade (Grade 1)
- iii. All timber described as selected Grade is to be second Grade (Grade 11)
- iv. All hardwood is to be prime Grade (Grade 1)
- v. All timber for permanent use in the building shall before use be approved by the Architect for quality in accordance with the foregoing specification for its respective grade.
- vi. Any timber not so approved by the Architect shall be removed from the site forthwith.

C. 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 attached 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 of 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.

D. SEASONING OF TIMBER

All carpentry timbers are to be seasoned to an average moisture content of not more than 20%. All joinery timbers are to be seasoned to an average moisture content of not more than 15%. The contractor is to make available on site a metre of testing moisture content of all timber delivered.

E. PREPARATION AND PROTECTION OF TIMBER

- i. 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.
- ii. 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.

F. SPECIES OF TIMBER

Only those timbers specified are to be used for the works, unless alternatives are authorized by the Architect in writing.

G. PRESSURE IMPREGNATED TIMBER

- i. All timber described as pressure impregnated shall be impregnated under vacuum and pressure with celcure, or Tanalith. Wood preservative with an average absorption of not less than 6.7kgs. of dry salt per cubic metre. In case of resistant species where this retention cannot be obtained the timber

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shall be treated to refusal point. All treated timber shall not be exposed to wet conditions for at least 14 days after treatment has been carried out. All cut ends, drilling or fabrications on the site producing new surfaces shall be thoroughly brushed or soaked with celcure B. salts applied in accordance with the manufacturer's instructions.

- ii. Any other method of timber impregnations will only be allowed at the Architect's approval.

H. HARDWOOD

All hardwood will comply with the requirement of BS 1186 part 1 BS 4047. It shall show a straight and regular grain throughout.

Hardwood shall be free from wooly texture, soft heart, sap wood, splits, shakes, all evidence of insect of fungi attack and rot and all faults caused by compression failure. There shall be no waney edges.

Hardwood shall be free from knots on exposed faces. Any hardwood showing visible imperfections will be rejected.

Preservatives shall not be used without the Architect's permission. Where indicated on the drawings, internal hardwoods will be treated with clear sealants as specified elsewhere.

I. SOFTWOOD

Softwood timber for carcassing work shall be either podocarpus or cypress to the approval of the Architect and shall be dimensions specified on the drawings.

Timber shall be accordance with the Groups listed in this clause.

All softwood shall comply with the requirements of BS1186 part 1. Timber shall be free from wooly texture, soft heart, sap wood, splits, shakes, pith showing on the surface, sloping grain exceeding one in eight checks, knots exceeding 25mm of diameter, loose knot or knot holes and any evidence of insect or fungi attack. There shall be no waney edges.

Where indicated on the drawings, the softwood will be treated with clear sealer or painted with gloss paint. All softwood is to be pressure impregnated against insect attack before delivery to site. Any ends cut after treatment shall be given two liberal coats of preservative.

J. PLYWOOD

All plywood shall comply with the requirements of BS 1455, be obtained from a manufacturer to be approved by the Architect and be of the thickness shown on the drawings.

Plywood shall be Exterior Grade except where otherwise stated. Plies shall be bonded together with adhesives complying with the requirements of BS 1203 grade WBP. Plywood shall be free from end joints (including joints in veneers) overlaps in core veneers, dead knots, patches and plugs, open defects, depressions due to defects in cure, insect attack (except isolated pinworm holes through face veneers only), fungal attack and from discolouration differing from that normally associated with species.

Face veneers shall be hard and durable and shall be capable of being finished to a smooth surface. Face veneers shall closely match the general joinery timber supplied.

K. CHIPBOARD

Chipboard shall be medium density wood particle board complying with BS 2604 part 2, produced in factories by an approved process.

L. BLOCKBOARD

Blockboard shall be of approved local or imported manufacture to BS 3444 glued throughout and softwood or hardwood faced as hereinafter specified and equal to a sample to be deposited with the Architect for approval and which when so approved shall form the standard for the works.

M. FIBREBOARD

Shall be insulating board to comply with BS 1142 of the types specified and of approved manufacture.

N. TEMPERED HARDBOARD

To be approved manufacture according in all respects with BS 1142 suitable for painting, prepared and fixed in accordance with the maker's instructions.

O. WOOD BLOCK FLOORS

- i. To be supplied and laid in 460 mm x 460 mm panels by a specialist all to the approval of the Architect.
- ii. On completion and immediately prior to applying the clear finish, the surface is to be twice machine sanded using first coarse and the fine sandpaper and brushed perfectly clean.

P. TIMBER DOORS

Doors are to be designed, manufactured and fixed in accordance with the relevant British standards summarized below:-

BS	PART	DATE	TITLE
476	8	1972	Fire Tests E.T.C
4787	1	1972	Door Dimensions etc
1186	1	1971	Quality of timber and workmanship
1227	1A		Hinges
3827			Builder's hardware - glossary

Q. FLUSH DOORS

Generally, the requirement for flush doors is that they have a minimum thickness of 40mm. They shall be faced both sides and there shall be hardwood lippings to all edges. Hollow core and semi-solid types shall contain adequate provision within the core for ironmongery (e.g. lock blocks etc).

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All hollow and semi-solid doors shall be faced with WBP bonded Exterior grade plywood. Except where indicated doors shall have hardwood veneered faces.

Vision panels where required shall be 150mm wide 900mm deep.

Flush doors shall be obtained from a supplier to be approved by the Architect. Flush doors shall comply with the requirements of BS 459 parts 1,2 and 3.

All edges shall be lipped with hardwood tongued into edge of the door. Fire resistant flush doors are to be constructed in accordance with BS 459 part 3.

The core of solid core flush doors shall be constructed of longitudinal laminations of precision planed timber, butt joined and glued with resin based adhesive under hydraulic pressure, the whole forming a rigid fire resistant raft.

Where doors are indicated as fire resistant they shall be constructed so as to exceed the requirements stated when tested in accordance with BS 476 part (1972) section 7.

R. HARDWOOD VENEERS

- i. Veneer facings shall be selected to the approval of the Architect.
- ii. No glass or synthetic fibre stitching will be permitted for jointing veneer leaves together.
- iii. Veneer shall be free from splits, dote, glue, stains insect or fungi attack and rot.
- iv. Filling or inlaying of any kind will not accepted.
- v. All wood veneers shall be bonded to the core material in such a way that no lifting and blistering shall occur.

S. LAMINATED PLASTIC VENEERS

Laminated plastic veneers shall be a decorative sheet 1.6mm thick complying with BS 3794 class 1. The pattern will be selected by the Architect. The laminate shall have decorative (pattern) finish on one face only. Patterns will be selected from the manufacturer's standard range

T. MISCELLANEOUS MATERIAL

- a) Tapered timber pellets for filling screw holes must be cut across the grain and shall be of the colour and grain being plugged.
- b) Metal fixing devices must be fully rust-proofed. Scramps, brackets, plugs, bolts etc., must be of a type, make and pattern approved by the Architect.
- c) Adhesives must be suitable for use in the local conditions and be compatible with the materials with which they are in contact.

U. NAILS AND SCREWS

Nails shall comply with BS 1201, screws shall comply with BS 1494 and bolts shall comply with BS 916.

WORKMANSHIP

V. TOLERANCES

The method of construction must accommodate tolerance as shown on the drawings and allow for ensuring that repetitive units can be accurately located in relation to grid lines and that tolerances do not accumulate. Reasonable tolerance shall be provided at all junctions between joinery and the building carcass, whether of masonry or frame construction, so that any irregularities or movement may be adequately compensated.

W. JOINTING

- i. All joints must be made as specified or detailed and the execution of all jointing shall be to the satisfaction of the Architect.
- ii. Joining surfaces of all connections exposed to the weather are to be thickly primed except where gluing is specified. Surfaces are to be in good contact over the whole area of the joint before fastenings are applied.
- iii. 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 $4/5$ 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.
- iv. Where the use of bolts and washers is specified the holes are to be bored from both sides of the timber and 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.
- v. Joints in joinery must be as specified or detailed and designed and secured as to resist or compensate for any stresses to which they may be subjected. All nails, springs etc., are to be punched and puttied.
- vi. 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 cross-tongued or otherwise reinforced.
- vii. Glues for load bearing joints or where conditions may be damp must be of the resin type.
- viii. For non-load bearing joints, or where dry conditions can be guaranteed, resin or organic glues may be used.

X. FRAMED WORK

The word “framed” shall mean and include all the best known methods of jointing woodwork together by mortice, tenon, dovetail or other methods, and for forming all necessary stops, mitres or mason’ mitres in members which are moulded, rebated etc.

Y. PLUGGING

Plugging and fixing to wall in all trades shall be executed by “Rawlplugging” or similar approved proprietary methods all in accordance with the manufacturer’s printed instructions. Hacking of holes and filing with timber plugs will not be permitted under any circumstances.

Z. CARPENTRY WORK

- i. All carpentry shall be executed with workmanship of the best quality. Scantlings and board shall be accurately sawn and shall be uniform in width and thickness throughout and shall be as long as possible and practicable in order to eliminate joints
- ii. All work shall be left with a swan surface except where specified to be wrot.
- iii. All work shall be accurately set out and in strict accordance with the drawings, and shall be framed together and securely fixed in the best possible manner with properly made joints. Provide all braids, nails, screws etc., as necessary and as directed and approved.
- iv. Actual dimensions of scantling for carpentry shall not vary from the specified dimensions by more than +3mm or -1mm. Sizes and thickness of wrot carpentry timber are nominal, that isto say a variation of 3mm from the specified sizes will be allowed from each wrot surface unless the thickness or size id described as finished in which case no variation from the stated thickness or size will be permitted.

AA. JOINERY WORK

All joinery work shall be wrot unless otherwise described.

- i. Sizes and thickness of joinery are nominal that is to say a variation of 3mm from the specified sizes will be allowed from each wrot surface unless the thickness or size is described as finished in which case no variation from the stated thickness or size will be permitted.
- ii. No joinery to be put in hand until the details have been supplied or approved by the Architect and in all cases the details are to be worked to.
- iii. All joinery shall be executed with workmanship of the best quality in strict accordance with the detailed drawings, molding shall be accurately and truly run on the solid and all work planed, sandpapered and finished to the approval of the Architect. All arises to be slightly rounded. All framed work shall be cut out, and framed together as soon after the commencement of the building as is practicable but should not be wedged up until the building is ready for fixing the same and any portions that warp, get in winding, develop shakes or other defects shall be replaced with new. In-door frames etc., the heart face of the timber shall be fixed away from the wall. As soon as required for fixing in the building the framing shall be glued together with glue as described and properly wedged or pinned etc., as directed.

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- iv. All beads, fillets and small members shall be fixed with round or oval braids or nails well punched in and stopped. All larger members shall be fixed with screws, the screws let in and pelleted over with wood pellets to match the grain.
- v. Cups and screws for fixing beads and fillets shall be spaced 150mm apart and 25mm from angles.
- vi. All joinery immediately upon delivery to the site is to be sorted and protected from the weather.
- vii. All joinery is to be primed before fixing but no work is to be primed until it has been approved by the Architect.
- viii. All fixed joinery which is liable to become bruised or damaged in any way, shall be properly cased and protected by the contractor until completion of the work.
- ix. When natural finish is specified, the timber in adjacent pieces shall be matched and uniform or symmetrical in colour and grain.

AB. SOFTWOOD

Fixing shall be by means of non-rusting screws with counter sunk heads to proprietary plugs or ground. Nails will not be permitted.

Sections shall be neatly and accurately cut so as to avoid splitting of the wood.

AC. HARDWOODS

Hardwoods are as described.

In jointed panels each piece shall be of the same species. Joinery for oiling shall have all surfaces of the same species and same character of grain.

Fixing shall be by means of brass screws with countersunk heads to proprietary plugs or grounds. Where work is face screwed heads of screws shall finish not less than 6mm below the surface and be covered with round teak pellets of appropriate thickness. Pellets shall be chosen and fixed so as to match colour and pattern of grain so far as is practical. Nailing will not be permitted. Sections shall be neatly and accurately cut with fine toothed saws.

AD. PLYWOOD

Plywood of the required thickness shall be used. The Contractor will not be allowed to make up thickness by gluing together sheets of thinner plywood.

Where cutting is required it shall be neatly and accurately performed with fine toothed saws so as to avoid splitting the face veneers and intermediate plies.

AE. CHIPBOARD

Where cutting is necessary it shall be neatly and accurately performed with fine toothed saws so as to avoid splitting the face veneers. Where raw edges arise from cutting these shall be faced with a matching hardwood fillet cut pinned and glued to match factory produced edges.

AF. BLOCKBOARD

Where cutting is necessary it shall be neatly and accurately performed with fine toothed saws so as to avoid splitting the face veneers. Where raw edges arise from cutting these shall be faced with a matching hardwood cut pinned and glued to match factory produced edges.

AG. LAMINATED PLASTIC VENEER

Laminated plastic veneers are to be fixed with an approved adhesive, care being taken to eliminate all air from beneath the laminate on fixing. The laminate is to be free from chipped or cracked portions and work so disfigured is to be moved and replaced. When the adhesive is set the laminate is to be neatly bevelled off along all rises with a plane.

Where plastic laminate is fixed to doors or shelves etc., without a laminate to the outer edge, a raised lipping is to be provided and the laminate finished flush against the lipping.

AF. FIXING DOORS AND FRAMES

Doors shall be properly fitted to give a uniform clearance of not more than 3mm all round and the hinges shall be let into doors.

Doors frames shall be properly framed at angles. Door stops shall be housed into grooves in frames.

Architraves shall be

provided to conceal finishes. Frames shall be fixed to grounds or plugs. Fixing shall be by means of non-rusting screws with countersunk heads. For hardwood frames screw heads shall be finished not less than 6mm below surface of the wood and shall be covered with matching round hardwood pellets of appropriate thickness. Pellets shall be chosen and fixed so as to match colours and pattern of grain so far as is practical. Nailing will not be permitted.

Except where indicated doors shall be kept clean for clear polyurethane varnish. Door frames shall be treated to match doors.

Glazing shall be wired glass 6mm thick with edges wrapped in wash leather and secured with hardwood glazing bead size 10mm x

15mm mitred at angles secured with brass screws and cups.

AG. CONSTRUCTION OF DOORS

- i. Flush doors specified as solid construction shall have a 100% solid core of vertical laminate Cedar or equal and approved.
- ii. Flush doors specified as semi-solid construction shall be constructed with timber stiles and rails, in filled with horizontal intermediate rails spaced equally apart and tenoned into stiles.
- iii. Unless otherwise specified, doors scheduled to receive a clear or veneered finish shall be lipped on all edges.
- iv. Where panels over doors are specified, such panels shall be constructed in the same way and with the same materials as the doors above in which they are situated, and the panels shall match the doors in every respect.
- v. For doors specified as plywood faced, the plywood shall not be less than 3mm thick, complying with the requirements of BS 1455, WBP type. Face veneers shall be Grade 1 for painted doors in every respect.
- vi. All doors shall be provided with lock blocks of minimum size 300mm x 75mm.
- vii. Glass beading strips shall be approved wash leather self-adhesive tape turned up over both sides of the glass and glazing surfaces and turned to the straight line.
- viii. All screws shall be countersunk, and screwed and pelleted in un-painted work.
- ix. Timber pellets shall be glued and tapped into the hole, making sure the grains line up, and are carefully trimmed back flush with joinery to give a clear, smooth overall surface.

AH. FITTINGS AND FIXTURES

The fittings, etc., are to be accurately constructed in accordance with the detailed drawings. The doors, drawers, etc., are all to fit and open and close smoothly and all work next to walls, floors and ceilings is to be soundly fixed and scribed to fit snugly against same.

AI. MOULDINGS

Moulded work shall be accurately worked to the full size details supplied by the Architect. Mouldings shall be worked on the solid unless otherwise stated.

AJ. CIRCULAR WORK

When circular work is specified it shall be built up with an appropriate number of pieces cut to the required shapes. The pieces shall be put together in two (or three) thickness so that they break joint, and shall be secured with hardwood keys and wedges or with hardwood pins (whichever is more appropriate).

AK. SCRIBING

Skirting, architraves, plates and other joinery works shall be accurately scribed to fit the contour of the irregular surface against which they will be required to form a close butt connection.

AL. FINISH

All joinery which is to be oiled and painted shall be finished smooth and cleaned by rubbing down by hand with fine glass paper.

AM. COMPLETION OF WORKS

Protection of all joinery and ironmongery must be maintained until completion of the contract as a whole. All joinery and glass is to be thoroughly cleaned before the building is handed over.

AN. DEFECTIVE WORK

All work judged to be defective must be removed and replaced as directed by the Architect.

IRONMONGERY

AO. GENERALLY

- i. Ironmongery shall be fixed with suitable screws to match and prices shall include for this
- ii. All locks and ironmongery shall be fixed before the woodwork is painted, handles shall be removed before the painting commences carefully stored and refixed after completion of painting.
- iii. All locks, springs and other items of ironmongery with moveable parts shall be properly tested, cleaned and adjusted where necessary to ensure proper working order at the completion of the works and left in perfect working order by the contractor.
- iv. The keys of all locks shall have labels attached with door references marked on before handing to the Architect.
- v. All locks shall be provided with a master key system and prices shall include for this as required by the client, and as instructed by the Architect. The client's requirements are to be obtained by the contractor before ordering.

PART EIGHT

STRUCTURAL STEELWORK AND OTHER METAL WORK SPECIFICATIONS

A. STEEL QUALITY

Structural steel shall comply with the requirements of B.S.4360 and shall be new and unused. It shall be free of imperfections, distortion, rust, scales of other deterioration or contamination by grease, paint and similar items.

B. TESTING

The Engineer may, where he so desires call manufacturer's work test certificates in respect of all steel, which tests shall have been performed in accordance with B.S.18. The Engineer may also carry out such further tests as he may consider necessary.

C. SECTIONS

The dimensions and properties of hot rolled structural steel sections and hollow sections shall be in accordance with B.S.2, part 1 and 2, or B.S.4848 for metric sized sections.

D. MINIMUM THICKNESS

All steelwork sections other than gauge metal sections, including cleats, gusset plates, etc. shall be not less than 8mm thick unless specifically indicated on the Drawings.

E. FORGING

All steel for forging and all forgings shall comply with the requirements of B. S. 29, and shall be subject to inspection and approval of the Engineer.

F. CASTING

All material used in the manufacture of castings and all castings shall comply with the requirements of B.S. 309, 1452 and 3100 and shall be subject to inspection and approval of the Engineer.

G. GAUGE METAL SECTIONS

Sections shall be manufactured from continuously hot dipped galvanized steel coil to B.S.2989 using steel to B.S.1449, part 1A and 1B, classification CR4 with a guaranteed minimum yield stress of 280 N/mm².

The sections shall be cold formed to the basic shapes given in B.S 2994 with the design and details conforming to Addendum No. 1 to B.S.449 (PD4064).

Section shall be sawn and holes may be punched so as to produce a neat round hole with no distortion. Holes and cut ends shall be painted with zinc rich paint as soon as possible after cutting.

H. "Z" PURLINS

"Z" purlins shall be fabricated in the longest practicable lengths with staggered joints. All connections shall have a minimum of four bolts. Sag rods and apex ties shall be provided where indicated.

STRUCTURAL STEELWORK AND OTHER METAL WORK SPECIFICATIONS

I. TUBULAR SECTIONS

For tubular construction, due allowance is to be made for sealing the ends of all tubes and hollow square or rectangular sections with welding or welded plates. Where end make connections to other members, they shall be welded on true and square.

Shop joints required in tubular members shall be full penetration but welds on to split backing rings.

J. STORAGE

Steel shall be stored at least 150mm above the ground and protected against rust and corrosion.

K. FABRICATION

Structural steelwork shall be fabricated in accordance with B.S.449.

L. SHOP DRAWINGS

The contractor shall prepare fully detailed working drawings of the structural steelwork and obtain the Engineer's approval before commencing any fabrication. The drawing to be submitted at least one week before it is planned to start fabrication.

M. EDGE PREPARATION

The longitudinal edges of all plates and cover plates forming plate girders or built-up girders and columns and all edges of gusset plates over 12mm thick shall be machined. Edges which are subsequently wholly incorporated in weld may be machine flame cut. The abutting ends of the parts of all compression members including the caps and bases of stanchions, built-up columns and stiffeners transmitting load through direct contact shall be machined after the members have been fabricated so that all the parts shall be in close contact when the joint is made. The edges of the other members may be machine flame cut, sawn, sheared or cropped but hand flame cutting will not be permitted. All burrs shall be removed by grinding, and sheared and cropped edges shall be dressed.

N. STRAIGHTENING

All plates, bars and rolled sections shall be carefully trued, straightened and taken out of winding by pressure before they are drilled. Heating or hammering rolled sections and plates will not be permitted.

O. TEMPLATES

The templates throughout the work shall be mild steel. In cases where actual members have been used as templates for drilling similar pieces, the engineer will decide whether they are fit to be used in the finished structure.

P. HOLES

All holes in the steelwork shall be drilled out and not punched. Whenever holes are drilled in one operation through two or more separate parts the parts shall be separated after drilling and the burrs removed by grinding. All slotted holes shall be finished with sides of the holes straight and parallel.

Q. JOINTS

No joints shall be made in any plate, bar or rolled sections except where shown on the Drawings or described in the specification.

R. ASSEMBLING AND MARKING

All steelwork shall be inspected in the fabricator's yard by the Engineer and where directed the steelwork shall be assembled to check the accuracy and interchangeability of the work. Before dispatch from the fabricator's yard all steelwork shall be cleaned down and clearly marked in paint or stencilled and stamped to facilitate sorting at the site. The markings shall be in conformity with the approved working and erection drawings.

S. WELDING GENERALLY

No welds will be permitted in any part of the permanent work except where shown or described on the approved working Drawings. All welding of steel shall be executed in accordance with the provisions of B.S.5135 and the workmanship shall be of the highest quality in all respects throughout. All welds shall be of the appropriate dimensions, they shall be sound, free from porosity, slag inclusion, undercutting and other defects, and shall be of clean and regular appearance throughout, and the execution shall be such as to ensure that the parts connected are properly aligned and positioned, free from distortion and so fixed together as to produce a homogeneous section of the correct dimensions. As much of the welding as is practicable shall be executed by means of automatic or semi-automatic processes and manual welding shall be kept to a minimum.

All welders shall have completed the tests described in part 6 or B.S.449 and may be required to carry out any of those tests in the presence of the Engineer.

T. ELECTRODES

All covered electrodes for the manual metal arc welding of grades of steel to B.S.4360 shall comply with the requirements of B.S.639 and B.S.1719: part 1. All electrode wires and fluxes for the submerged arc welding of grades of steel to B.S.4360 shall comply with the requirements of B.S. 4164.

All electrodes shall be of a type, size and quality appropriate to the class of work for which they are intended and shall be supplied by approved manufacturers and shall be of the heaviest gauge consistent with obtaining adequate penetration. Each batch of electrodes shall be accompanied by the manufacturer's certificates stating the date of manufacture, together with certificates giving the results of the initial test and of the most recent periodic check tests.

All electrodes shall be stored in their original unbroken bundles or packages in a warm dry and well ventilated place to which the Engineer shall have access.

All electrodes for welding shall be used strictly in accordance with manufacturer's instructions and shall be so chosen that the properties of the deposited metal are in no way inferior to those of the parent metal.

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Under no circumstances shall electrodes be used in a damp condition and any electrodes which have parts of the flux covering broken away or damaged in any respect whatsoever shall be discarded.

U. WELDING TRIALS

Whenever so directed by the Engineer and prior to the commencement of fabrication, welding and flame cutting procedure trials shall be carried out on typical examples of the various types and categories of welded members and joints use representative samples of the materials to be employed in the work. These trials shall demonstrate to the satisfaction of the Engineer the suitability and adequacy of the methods and procedures to be adopted in the fabrication.

The samples of material to be used in the aforesaid trials shall be selected and marked by the Engineer when the materials are inspected at the rolling mills and the various types and categories of members and joints shall be welded in a manner simulating the most unfavorable conditions that will be experienced during fabrication or assembly. After completion of welding the various examples shall be sectioned for subsequent examination and testing.

Any approval by the Engineer of the welding methods and procedures shall in no way limit or restrict the right and authority of the Engineer to subsequently reject any welds or welded joints that in his opinion fall below the standard appropriate to the class of work.

V. WELD TESTING

The contractor, his subcontractor and/or his fabricator shall be responsible for the preparation of all welded test pieces as and when required by the Engineer and for the provision, maintenance and efficiency of all apparatus and equipment necessary to the conducting of such tests in accordance with the procedure laid down in B.S.709.

Non-destructive testing of welds on completed member and joints shall be carried out by the Engineer during the course of fabrication as required and any length of weld or any welded joints exhibiting any defects shall be rejected and all such defects shall be cut out and replaced with sound work. The entire cost of making good or replacing any such rejection shall be borne by the contractor.

The contractor, his sub-contractor and/or his fabricator, shall be responsible for all preparations necessary for the carrying out of non-destructive testing of welds on completed members and completed members and joints to the satisfaction of the Engineer and shall provide all assistance required for conducting such tests.

W. WELDING PLANT

All plant used for shop and site welding shall be capable of maintaining at the fusion face the voltage and current specified by the manufacturer of the electrodes and the contractor, his sub-contractor and/or his fabricator shall provide the necessary instruments for measuring the voltage and current as and when required by the engineer.

X. BOLTS

Black bolts and nuts shall be in accordance with B.S. 4190 and shall have their bearing faces machined. Close tolerance bolts and nuts shall be in accordance with B.S.3692 and shall have their bearing faces machined, be turned on the shank and shall be screwed with unified coarse threads to B.S.1580. Flat and taper steel washers shall be in accordance with B.S.4320. Washers shall be provided under the nuts of all black bolts and close tolerance bolts so that the nut, when screwed up tight, does not bear on the shank of the bolt.

Taper washers of correct angle of taper shall be provided under all bolt-heads and nuts that are required to bear on bevelled surfaces.

Y. HIGH STRENGTH FRICTION GRIP BOLTS

High strength friction grip (H.S.F.) bolts, nuts and washers shall be of either high strength load indicating bolts or nuts of an approved pattern or shall be provided with load indicators of an approved pattern under the heads of the bolts. The dimension of high strength friction grip bolts and nuts shall be in accordance with B.S.4395 except only for the dimensions of the load indicating washers shall be supplied by manufacturers approved by the Engineer.

Non load indicating bolts or washers may be used with prior approval of the Engineer. The part-turn method of tightening shall be used with these bolts.

All bolts shall have clear distinctive marks to identify them. The bolts and washers shall be electro-zinc plated or zinc coated sherardizing and the nuts cadmium plated by the manufacturer to ensure that the nuts do not cease under tension. All components shall be stored carefully to ensure no deterioration of finish.

Z. USE OF HIGH STRENGTH FRICTION GRIP BOLTS

The use of high Strength friction Grip Bolts shall be in accordance with B.S.4604.

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AA. SURFACES

Surfaces of plates in joints shall be free of paint or any other applied finish (except galvanizing), oil, dirt, rust, loose scale, burrs or other defects which would prevent solid seating of the parts or would interfere with the development of friction between them.

AB. MINIMUM PLY THICKNESS

General Grade Bolts - no outer ply, and wherever possible no inner ply, shall be smaller in thickness than half the bolt diameter or

10mm whichever is the less.

High Grade Bolts - no outer ply, and wherever possible no inner ply, shall be less than 10mm.

AC. SPACING OF BOLTS

This shall be as shown on the Drawings or otherwise in accordance with B.S.449. The tool to be used for tightening should be taken into account when arranging the disposition of bolts in a joint.

AD. ASSEMBLY OF JOINT

Holes shall be lined up with draft pins until bolts in the remaining holes are fully tightened. Driving of bolts will not be permitted. The ends of the bolts and nuts shall be clear and lightly lubricated. No lubricant shall come into contact with the ply faces. Each bolt and nut shall have a flat round washer and taper washer as necessary. Load indicating washers shall be fitted with the protrusions against the bolt head or against a special nut face washer when fitted at the nut end.

AE. TIGHTENING

Tightening shall be in a staggered pattern agreed with the Engineer beforehand, working from the centre of joint outwards. Each bolt tightening operation shall be carried out speedily until the required gap under the load indicating washer is reached. This shall be measured using a feeler gauge.

Appropriate allowance shall be made in the gap for the location of the indicating washer relative to the bolt. Tightening may be carried out using manual or power wrenches but not torque wrenches and must be carried out until the bolt reaches the minimum specified tension.

Full details must be obtained from the manufacturer regarding details of the installation, tightening and use of load indicating washer to confirm the correct tension has been developed in the bolts.

AF. BOLT FAILURE

If after final tightening a nut or bolt is slackened off for any reason, or becomes slack, the nut, bolt and washer must be discarded and not used again.

AG. PAINTING

The gap under the load indicating device shall be filled with paint.

AH. PART TURN TIGHTENING

In certain circumstances the part turn method may be permitted. The sequence of tightening bolts in a group shall be agreed beforehand with the Engineer. The bolts shall be tightened initially with a standard podger spanner to bring the joint surfaces into close contact. This must be checked before the tightening process is completed.

A permanent mark shall be cut on the nut and protruding end of the bolt using a cold chisel and the nut finally tightened with an impact wrench to turn it relative to the bolt and specified amount to produce the required minimum tension.

AI. SHOULDERED BOLTS AND NUTS

Shouldered bolts and nuts shall be black bolts and nuts in accordance with B.S.2078 and shall be screwed with unified coarse threads to B.S. 1580 and shall be of the dimensions shown on the Drawings.

Shouldered bolts shall be provided at all expansion and other sliding joints and shall be supplied with all necessary washers.

AJ. ANCHOR BOLTS AND NUTS

Anchor bolts and nuts for setting in concrete shall be as shown on the Drawings or as approved by the Engineer and shall be fixed in accordance with the manufacturer's technical information sheets giving full particulars of the bolts including the mechanical properties of the bolts, the safe working loads and methods of fixing and usage.

AK. PACKING FOR SHIPMENT

All cleats, gussets, stiffeners, brackets and other projecting material arising out of fabrication shall be protected from damage while being transported in such a manner as to prevent distortion. All machine surfaces shall be suitably protected. All straight bars, except small pieces, shall be shipped in bundles of convenient size and shall be temporarily bolted together or bound with annealed steel wire.

All bolts, nuts, washers, screws, small pieces and other small articles shall be adequately packed in crate or other suitable containers. Each piece, packing, bundle and crate shall be clearly marked with its weight and with the appropriate shipping marks before despatch from the fabricator's yard.

AL. ERECTION OF STRUCTURAL STEELWORK

The erection of all structural steelwork at the site shall be in accordance with the provision of B.S.449.

When lifting and fitting steelwork into position care shall be taken that the members are not twisted, bent or damaged.

Suitable slings, blocks, tackles, shear legs, derrick, cranes and other types of lifting appliances and equipment shall be provided and every care and precaution shall be taken to ensure the safety of all persons engaged in such work.

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The erection of the steelwork shall be carried out in such a manner as not to subject any of the members to overstressing, or reversal of loading, which the members are not designed to support. During erection the steelwork shall be securely braced, propped or otherwise temporarily supported until such time as the steelwork is lined, levelled and braced and bolted in its final position.

AM. ERECTION BY OTHERS

Where the steelwork is to be erected by parties other than the fabricator, then the fabricator shall supply complete drawings of the steelwork with itemised and numbered pieces corresponding to the references stencilled on the actual pieces together with all necessary bolts, washers of all kinds required for the complete erection of the steelwork. The fabricator shall also provide any special instructions on the method and sequence of erection and any notes maintaining stability, or pointing out any erection procedures which can cause overstress or collapse.

The erector, if in doubt of any methods proposed by himself or laid down by the fabricator shall consult with the Engineer and the fabricator before continuing.

Notwithstanding all instructions the responsibility for erection in a proper manner shall lie with the erector.

AN. SETTING OUT

The steelwork shall be set out accurately to line and level and plumbed vertically (or such other angle as required) in accordance with the Drawings and no permanent fixing or final tightening up of the bolts or other connections or concreting in of steelwork shall be carried out until the steelwork has been approved by the Engineer.

AO. HOLDING DOWN BOLTS

Holding down bolts shall normally be placed and concreted in by the main contractor. The steelwork erector shall check the accuracy of the position and level of the bolts before the bolts are concreted in. Any pockets formed for adjustment or placing of the bolts after the main concrete base is cast shall be as shown on the Drawings or to the Engineer's approval.

AP. BEDDING OF BASE PLATES

Steel stanchions with base plates shall be supported on steel shims or wedges to obtain the correct line and level of the stanchions and the holding down bolts tightened by hand. Prior to bedding the base plates, the space under the plates shall be cleaned out.

The base plates shall be bedded using cement/sand 1:2 mortar with sufficient water to make the mortar flow under pressure or by vibration or by rodding until the whole space under the base is completely filled. The steel shims or wedges shall be left in. After hardening of the mortar the holding down bolt shall be tightened by spanner as required.

AQ. CONCRETING IN OF MEMBERS

Where any portion of a steel member is designed to be cast into concrete, the surfaces in contact with concrete shall be thoroughly cleaned of paint or other adherent matter.

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When members are to be concrete in, whether supplied with temporary positioning bolts or otherwise, they shall be lined and levelled and plumbed and firmly supported before concreting in.

If base plates are shown on the drawings, these shall be grouted in as above prior to concreting.

AR. NAILS, SCREWS AND BOLTS

Nails, screws and bolts shall be of best quality mild steel of lengths and weights approved by the Architect. Nails shall be to

B.S.1202 and bolts to B.S.916.

Bolts shall project at least two threads through nuts and all bolts passing through timber shall have washers under heads and nuts.

AS. FIXING METAL WINDOWS, DOORS, ETC

The contractor's prices for fixing metal windows, doors, etc., shall include for assembling and fixing, including screwing to wood frames and cutting mortices for lugs in concrete or walling and running with cement mortar (1:4), bedding frames in similar mortar and pointing in mastic, bedding sills, transomes, mullions in mastic, making good plaster around both sides, and fixing , oiling and adjusting all fittings and frames.

AT. METAL WINDOWS

Metal windows shall be steel standard section windows supplied and installed by the contractor or an approved specialist, sub- contractor. In the case of a specialist sub-contractor, the contractor shall provide any general or special attendance as may be required by the sub-contractor.

PART NINE

FINISHINGS SPECIFICATIONS FINISHINGS

GENERAL

A. OTHER SPECIFICATIONS

All other specifications of this contract where applicable are deemed to apply equally to the finishing specifications.

B SAMPLES

The contractor shall prepare at his own cost sample areas of the paving, plastering and rendering as directed until the quality, texture and finish required is obtained and approved by the Architect after which all work executed shall conform with the respective approved samples.

C FINISHED THICKNESSES

The thicknesses of floor finishes quoted in this section of the specification shall be the minimum requirements.

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Suspended floors shall have a constant structural thickness and have level top surfaces. The finished floor surface will equally have constant level and any adjustment needed to achieve this effect with the varying floor finish materials is to be made in the screeds beneath the same.

Slabs bearing on the ground may be cast to varying levels, and be of constant thickness with varying formation levels, or have varying thicknesses at the option of the contractor. This stipulation in no way relieves the contractor of the requirements of the specifications for the structural work.

D MATERIALS GENERALLY

All materials shall be of high quality, obtained from manufacturer's to be approved by the Architect. Cement, sand and water shall be as described under concrete work and Blockwork.

E BONDING

Bonding compounds, etc., for use in applying plaster and similar finishes direct to surfaces without the use of backings or screeds are only to be used if approved by the architect and are to be used strictly in accordance with the manufacturer's printed instructions.

F. CHASES, OPENINGS AND HOLES

All chases, holes and the like which were not formed in the concrete or walling shall be cut, and all service pipes shall be fixed and all holes and chases filled with mortar before paving and plaster work is commenced. In no circumstances will the contractor be permitted to cut chases, holes and the like in finishes pavings or plasterwork.

INSITU FINISHINGS

G GENERALLY

The term plastering refers to the operation internally and rendering to the same operation externally but for ease of reference the term plastering has generally been used in this specification to describe both operations.

H MIXES

The methods of measuring and mixing plaster shall be as laid down under concrete work and the proportions and minimum thickness of finished plaster shall be in accordance with the following:-

Item of work	Mix	Minimum Thickness and finish
Internal Plaster	1 part cement	16mm finish to walls and ceilings.

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¼ part lime wood float finish unless otherwise

4 parts sand specified.

----- External Render

1 part cement 12mm finish in two coats

4 parts sand

Tyrolean finish Ditto 6mm finished thickness in two coats
on 10mm plastered backing

To obtain greater plasticity a small quantity of lime may be added to the mixes for external plastering at the Architect's discretion but in any case this is not to exceed ¼ part lime to 1 part cement.

With regard to the lime mortars gauged with cement, of the cement to small quantities of the lime/sand mix shall preferably take place in a mechanical mixer and mixing shall continue for such time as will ensure uniform distribution of materials and uniform colour and consistency. It is important to note that the quality of water used shall be carefully controlled. Plaster may be mixed either in a mechanical mixing machine or by hand.

Hand mixed plaster shall first be mixed in the dry state being turned over at least three times. The required amount of water should then be added and the mix again turned over three times or until such time as the mass is uniform in colour and homogeneous.

The plaster shall be completely used within thirty minutes of mixing and hardened plaster shall not be remixed but removed from the site.

I PREPARATION OF SURFACES FOR PLASTER ETC.

Irregularities in the surfaces to be plastered or rendered shall be filled with mortar, without lime, twenty four hours before plastering is commenced. Joints in blockwork etc., are to be well raked out before plastering to form a good key. Smooth concrete surfaces to be plastered shall be treated with an approved proprietary bonding agent or hacked to provide an adequate key for the plaster.

All surfaces to be plastered or rendered shall be clean and free from dust, loose mortar and all traces of salts. All surfaces shall be thoroughly sprayed with water and all free water allowed to disappear before plaster is applied.

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As far as practical plastering shall not be commenced until all mechanical and electrical services, conduits, pipes and fixtures have been installed.

Before plastering is commenced all junctions between differing materials shall be reinforced. This shall apply where walls join columns and beams, particularly where flush and similar situations where cracks are likely to develop and as directed by the Architect. The reinforcement shall consist of a strip of galvanized wire mesh. Expansion or equal approved 15cm wide which shall be plugged, nailed or stapled as required at intervals not exceeding 45mm at both edges. The surfaces to which such mesh shall be applied shall be painted with one coat bituminous paint prior to fixing the mesh.

J APPLICATION OF PLASTER AND RENDER

After preparation of the surfaces a key coat of cement slurry shall be applied to the wetted surface to be plastered. When this coat is dry the plaster coat shall be applied, by means of a trowel between screeds laid, ruled and plumbed as necessary. This coat which shall be to the required thickness shall be allowed to be so hard and then cured as described. Surfaces are to be finished with a wood or steel float to a smooth flat surface free from all marks.

Tyrolean finish shall be applied with an approved machine to give a finish of even texture and thickness.

The sprayed finish shall be applied in two separate coats allowing time for drying between coats.

Application in one continuous operation to build up a thick layer will not be permitted. The total finished thickness of the two sprayed coats shall be not less than 6mm.. the sprayed finish shall not be applied until all repairs and making good to the undercoat are completed. any plaster which adheres to pipes, doors, windows and the like shall be carefully removed before it has set. Curing shall take place after the application of the second coat. The pressed finish as directed by the Architect. Where coloured Tyrolean is required this shall be obtained by the addition to the mix of any approved colour pigment.

All plastering and rendering shall be executed in a neat workman like manner. All faces except circular work shall be true and flat and angles shall be straight and level or plumb. Plastering shall be neatly made good around pipes or fittings. Angles shall be rounded to 6 mm radius.

All tools, implements, vessels and surfaces shall be at all times kept scrupulously clean and strict precautions shall be taken to prevent the plaster or other materials from being contaminated by pieces of partially set material which would tend to retard or accelerate the setting time.

K CURING OF PLASTER

Each coat of plaster is to be maintained in a moist condition for at least three days after it has developed enough strength not to be damaged by water.

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They shall be securely plugged, nailed or stapled as required at intervals not exceeding 450mm at both edges.

C ANGLE BEADS

Where required by the Architect, salient external angles of plastered walls shall be protected with galvanised mild steel angle beads complying with BS 1246 Fig.7 profile C3.

They shall be securely plugged, nailed or stapled as required at intervals not exceeding 450mm at both edges.

A PLASTER STOPS

Where shown on details, plasterwork shall be stopped against “expamet” galvanized steel plaster stop reference 565 which shall be securely nailed to wall in the positions indicated on the drawings.

B CEMENT AND SAND SCREEDS

Screed shall be mixed and formed as described.

C GRANOLITHIC PAVING

The granolithic paving shall be laid by a specialist floor layer and constructed as follows:-

Curing compounds if specified or approved by the Architect shall be used in strict accordance with the manufacturer’s instructions.

Surface hardening solutions of sodium silicate if purchased as liquid shall be of the grade sold for this purpose. Fourteen days after curing the surface shall be sprayed with three coats of sodium silicate solution and spread evenly with a mop or soft brush. Unabsorbed silicate left on the surface after the last application is to be washed off.

Solution is to 1:4 by volume for first coat, 1:3 for second, 1:2 for third, applied at 24 hour intervals.

The base concrete structural floor shall be finished with a tamped surface.

Shortly before the granolithic topping is to be laid the surface of the base concrete is to be thoroughly prepared to provide a good bond. The base concrete shall be hacked by hand or mechanically so that its laitance is completely removed to expose clean coarse aggregate. All traces of dust formed as a result of hacking etc., shall be removed. The base concrete shall be thoroughly wetted prior to laying. Any excess water shall be removed prior to the grouting.

The prepared surface of the base concrete shall be covered with a grout consisting of one part cement and one part sand mixed to the consistency of thick cream and it shall be scrubbed into the surface with a stiff broom.

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The granolithic topping shall be mixed in the following proportions by weight:-

1 part cement, 1 part fine aggregate and 2 parts coarse aggregate.

The water content of the granolithic topping shall be kept as low as possible consistent with obtaining full compaction of the topping with the plant available in order to avoid segregation of excessive laitance and in no circumstances must water/cement ratio exceed

0.42 by weight.

The granolithic topping shall be mixed for a period of not less than 1 1/2 minutes after all the materials have been placed in the mixer drum. No concrete shall be removed from the drum so that some water will enter the drum before the cement and aggregates. Each batch shall be discharged completely before the next batch is introduced. No extra water or other material shall be added to the mix after it has left the mixer.

If electrical conduit, trunking or any other items are required to be buried within the granolithic topping and the thickness is reduced at any point the contractor is to ensure that steps are taken to eliminate the possibility of cracking in the granolithic topping by means of galvanized wire mesh reinforcement in the flooring or other approved method. The extent of buried conduits, etc., should be ascertained prior to tendering and allowance for complying with this requirement will be deemed to be included in the rates for granolithic flooring.

The granolithic topping shall be laid in areas not exceeding 14M². The length of any bay should not exceed 1 1/2 times the width of that bay. Joints shall be made in the granolithic topping over all joints in the base concrete and over all supporting beams for suspended floors.

Unless otherwise indicated on the drawings all contraction and construction joints in the granolithic topping shall be simple but joints without a filler.

The forms shall be fixed rigidly on a firm foundation and supported throughout their length so that they will not be disturbed by the spreading and compacting of the concrete.

The forms shall be true to line within + or -1mm and to level within + or -2mm. The forms shall be set well in advance of laying the topping and shall be checked for level immediately before concreting starts. The granolithic topping shall be placed as soon as possible after being mixed in two courses each 31mm thick. In no circumstances should the depth of granolithic spread in one operation be greater than that which can be fully compacted by the means available. No more than 1 hour should elapse between placing the courses. The mix proportions and water content of the granolithic shall be identical in each course.

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The lower course must be compacted before the upper course and each course of topping shall be fully compacted with neither segregation nor excessive laitance. Particular care shall be taken to ensure full compaction of the concrete should be placed to an adequate surcharge to ensure full compaction.

After the topping concrete has been placed, levelled and fully compacted it shall be trowelled at least three times at intervals during the ensuing 6 - 10 hours so as to produce a uniform and hard surface with high resistance to abrasion. Under no circumstances should cement be sprinkled on the surface and trowelled in to absorb surplus water.

As soon as the surface has been finished it shall be protected against rapid drying out by erecting barriers against wind or draughts and against strong sunlight. As soon as the concrete has hardened sufficiently to prevent damage to its surface the floor shall be cured continuously for a minimum of 7 days by one of the following means:-

- i. By means of wet canvas or straw mats or 50mm thickness of damp sand laid on the surface and kept continuously damp in position for the full curing period.
- ii. By means of building paper, plastic or other waterproofing sheeting which shall be kept in close contact with the surface of the concrete. The covering overlap the sides and ends of the slab and shall be lapped 75mm at all joints. The covering shall be securely held in position for the full curing period.
- iii. By spraying the surface with an approved proprietary curing medium not less than one gallon of which shall be applied to every 20 m² of surface.

At the end of the curing period the contractor shall take all precautions required by the Architect to ensure that the floor will dry out slowly. Under no circumstance will artificial heating be permitted in the building for a period of at least six weeks after the topping has been laid and thereafter the temperature shall not be increased rapidly.

Side forms shall not be removed from freshly placed granolithic until it is at least 12 months old and then only with the Architect's approval. Care shall be taken to avoid damaging the granolithic. If any damage occurs the contractor will be responsible for making good to the Architect's satisfaction.

A INSITU TERRAZZO WORK

The terrazzo pavings and screeds under are to be laid and polished complete by an approved specialist firm. Where the screed is to be bonded to the concrete structural sub-floor, the latter shall be finished with a tamped surface and left clean and free from dust and grease.

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON LR. 27425

Before laying the screed the surface shall be covered with a grout of one part sand and one part cement brushed in with stiff broom. The screed is to be laid before the grout has set.

All screeds under in-situ and precast terrazzo paving are to be laid by the approved specialist firm. The screeds shall consist of one part ordinary Portland cement to three parts sharp washed sand. This mix may be varied by agreement on the responsibility of the approved specialist firm.

The screed is to be reinforced with 22 gauge galvanized steel wire netting with mesh not exceeding 1” laid direct on the sub-floor of bays exceeding 1 square metre.

The screed backing in-situ skirting’s to be such as to adhere firmly to the various materials of the walls. The thickness of in-situ terrazzo finishes are minimal and they may be increased if the specialist considers it necessary with corresponding reductions to the screed thicknesses providing the overall thickness of the finished flooring is maintained and without adjustment to the price quoted. The following thicknesses are assumed in measuring the terrazzo:-

Finish	Bedding Screed	Total
In-situ paving	25	40
In-situ margins	25	40
In-situ skirtings	8	12

If electrical conduit, trunking or other items are required to be buried within the depth of the screed and flooring and the total thickness is reduced at any point the flooring specialist is to ensure that steps are taken to eliminate the possibility of cracking in the screed and consequent damage to floor finish by means of galvanised wire mesh reinforcement in the screed and flooring or other approved method. The extent of buried conduit, etc., should be ascertained prior to tendering and allowance for complying with this requirement will be deemed to be included in the rates for terrazzo paving’s and screeds under.

The in-situ terrazzo paving is to consist of two parts of white marble chippings to one part of white Portland Cement to B.S.1014. The marble chippings to be fine (graded 3mm to 6mm in equal proportions) rounded granular clean and free from dust and impurities.

In-situ terrazzo paving should be laid on the screed as soon as practicable and not more than three days after the laying of the screed. After laying the surfaces are to be kept moist until ready for polishing.

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON LR. 27425

The in-situ terrazzo paving should be laid in panels separated by dividing strips in the positions shown on the drawings. Dividing strips are to be white plastic the full depth of the paving and screed and bedded into the screed with the tip edges truly levelled with the finish polished floor level. The thickness of the dividing strips is to be 5mm.

Polishing of in-situ terrazzo paving is to be carried out by a mechanical polisher with graded abrasives and any necessary water. Making good of any defects during polishing is to be done with cement grout matching in colour that used in the terrazzo paving.

The finish of in-situ terrazzo pavings is to be smooth and imperforable and is to be approved by the Architect.

The terrazzo pavings is to be washed clean on completion and covered with a thick bed of sawdust or other approved protective layer. This should be maintained and renewed as necessary and cleared away on completion.

Lay in-situ skirtings to match paving or of approved colour and finish coved at junction with paving of floor finish to 20mm radius. Execute all required angles and stopped or fair returned ends.

Vertical dividing strips to match those used in paving are required at not more than three feet intervals. A diving strip is required between paving and skirting at the commencement of the coving.

Facing of diving strip nearest to wall to be 200mm from face of skirting.

A horizontal diving strip is required at top skirting finished flush with wall finish over.

Where in-situ terrazzo skirtings are required under door frames, etc., a pencil round junction is to be made threshold paving in lieu of coving as shown on drawings.

In-situ margins shall have dividing strips to match those used in pavings. They shall be positioned at junctions with paving and skirting and transversely at not more than three feet intervals to continue vertical strip in skirting.

All internal angles and coves are to be rubbed by hand with carborundum block to be polished finish matching the finish of the paving to the Architect's approval.

A SURFACE HARDENERS

Floor hardeners shall comprise an approved type guaranteed by the makers to produce a hard dense concrete with high abrasive resistance, impervious to the penetration of heavy oils, acid or alkali solutions and to be used strictly in accordance with the maker's instructions.

The first dressing of sodium silicate for granolithic flooring shall be one part of sodium silicate to six parts of water by volume. Subsequent dressing shall be composed of one part of sodium silicate to four parts of water by volume, for all surfaces. The two liquids shall be well mixed together, sprayed over the flooring and spread evenly with a mop or soft brush, any excess being wiped off and the flooring allowed to dry at least 24 hours after dressing. After final drying, floors shall be washed with clean water.

B RATES OF IN-SITU WORK

The rates for in-situ work shall include for raking out joints of blockwork or bonding coat or spraying cement slurry on new concrete surfaces to form key, for work in narrow widths, small and isolated areas rounded arrises, fair and chamfered edges, for making good up to boundaries of other work for making good working around pipes, brackets etc., and for all other incidental labours.

Rates shall also include for masking before the application of spray finishes work executed overhead, temporary rules, supports, screeds and templates.

TILES, SLAB AND BLOCK FINISHINGS

B VINYL ASBESTOS TILES

Vinyl asbestos floor tiles shall comply with B.S 3260 of an approved manufacturer to patterns as directed by the Architect. Adhesives are to be recommended by the manufacturer in writing and approved by the Architect.

The tiles are to be laid and bedded direct in adhesive on to a cement and sand bed to make up the total paving thickness.

The cement and sand screed is to be finished with a steel trowel to a perfectly smooth surface before the application of the mastic and tiling.

On completion, vinyl asbestos tiles are to be sealed and polished with wax all in accordance with the manufacturer's printed instructions.

C CLAY TILE PAVING

Clay tile paving are to be in 150mm x 150mm tiles obtained from an approved manufacturer, and are to be laid on prepared screeds. The tiles are to be bedded in cement and sand (1:4) with straight joints in each direction. Upon completion grout in cement and wash and clean down. Tiles are to be cut with an electric tile cutting saw.

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D GLAZED WALL TILES

Glazed wall tiles shall be in accordance with B.S1281 and shall be 150mm x 150mm x 6mm tiles from the standard colour range with cushion edges. Wall tiling shall be carried out in accordance with C. P.212.

E PRECAST CONCRETE PAVING SLAB

To be all in accordance with B.S.368. The slabs are to be of the sizes given herein and bedded, jointed and pointed in cement lime mortar. (1:2:9).

F RATES

The rates for tile, slab and block finishing shall include for rounded edge tiles and angles, cutting and fitting up to boundaries and around pipes, brackets, etc., and waste; for work in narrow widths, small and isolated areas and for all other incidental labours.

PART TEN

GLAZING

MATERIALS

A GENERAL

Glass used in glazing and for mirrors shall be best quality clear glass free from visible defects so as to afford uninterrupted vision or reflection as appropriate, and without obvious distortion.

B STANDARDS

Glass for glazing and mirrors shall be of approved manufacture and is to comply with B.S.952 in all respects free from flaws, bubbles, specks and other imperfections.

C CLEAR SHEET GLASS ETC.

The clear sheet glass shall be ordinary glazing (OG) quality.

D PLATE GLASS

To be of type described and as approved by the Architect.

E OBSCURED GLASS

To be of type described and as approved by the Architect.

I Putty

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

A MIRRORS

Mirrors shall be polished float glass silverin quality, protected at back with electro-copper backing coated with shellac varnish and paint. The mirrors are to be fixed with chromium plated dome headed mirror screws with plastic or rubber distance pieces and washers unless otherwise stated and rates shall include for this.

WORKMANSHIP

B GENERAL

Glazing of all types and in all locations shall be carefully executed by artisans skilled in this type of work and in conformance with recommendations of C.P.152. Glazing shall be carefully fitted so that it is not subject to pressure and stress imposed by being an overtight fit within the framing.

C MEASUREMENTS

Each element (door, window etc.) to receive glass shall be accurately measured to ensure a perfect fit subsequently.

D SINGLE GLAZING

Single glazing shall be executed with glass of the various types described herein. Ordinary (non –safety) glass may be pre-cut or cut on site.

E WIRED GLASS

Wired glass shall be cut so that the wires embedded are truly vertical and horizontal (i.e at right angles to the cut edges).

F SAFETY GLASS

Safety glass shall be factory cut before delivery to site. Site cutting will not be permitted.

G STORAGE AND HANDLING

Glass shall be delivered to site in stout containers and clearly marked. The containers shall incorporate sling attachment points for lifting bridles. Glass shall be stored under cover so that the panes are truly vertical.

H PROTECTION

After fixing glass shall be boldly marked with paper or whitewash so that it is clearly visible. In positions where damage due to construction traffic or activity is likely to occur stout screens composed of hardboard or fiberboard on battens shall be arranged to protect the glass.

A DAMAGE

Should any glass delivered to site be found to be damaged it shall not be incorporated into the works without the express permission of the Architect. Should glazing installed be damaged for any reason it shall be removed and replaced free of charge to the satisfaction of the Architect. Should any adjacent works be damaged this shall equally be reinstated free of charge to the satisfaction of the Architect.

B DEFECT WORK

All glass shall be checked before installation to ensure that defective glass is not installed. Notwithstanding this, if in the opinion of the Architect, any installed glazing is defective it shall be removed and replaced free of charge to the satisfaction of the Architect.

C GLAZING TO WOOD

Glazing shall be secured to wood framing with hardwood beads. Edges shall be wrapped in wash leather so that the wash leather finishes just below the surface of the bead. No adhesives shall be used.

D GLAZING TO METAL

Glazing shall be secured to metal framing with clip in butyl rubber gaskets.

E GLASS THICKNESS

Glass thickness shall conform to the recommendations of C.P.152 and the manufacturer's recommendations for sizes of panes relative to the position in the building and the effects of wind pressure (both negative and positive).

F CLEANING

All window glazed panels and mirrors shall be cleaned both inside and out immediately prior to the handing over of the building to satisfaction of the Architect.

PART ELEVEN

SPECIFICATIONS PAINTING & DECORATING PAINTING AND DECORATING MATERIALS

A MANUFACTURERS

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Except where stated all materials shall be obtained from approved manufacturers. The contractor shall state the name and address of the manufacturer whose materials he proposes to use. Once approval has been given the contractor shall not obtain materials from other sources without the prior written agreement of the Architect.

B GENERAL

Each succeeding coat of priming, undercoating and finishing (pigment) or clear coating shall be sufficiently different in colour as to be readily distinguishable.

All primers and paints in one system upon a particular surface shall be obtained from the same manufacturer. The mixing of paints, etc, of difference brands before or during application will not be permitted.

C EMULSION PAINTS

Emulsion paints shall be matt to satin finish vinyl emulsion paint. The first (mist) coat shall be thinned in accordance with the manufacturer's instructions.

D GLOSS PAINT

Gloss paint shall be hard gloss finish oil paint.

E LEAD BASED PAINT

The use of lead based paints will not be permitted.

F CLEAR FINISHES

Clear finishes internally shall be clear polyurethane varnish (one pack).

G PRIMERS AND UNDERCOATS

Unless otherwise specified, primers and undercoats shall be the type recommended by the manufacture of the finishing coats specified for a particular surface. Primer for external bare metalwork surfaces shall comply with B.S 2523.

H KNOTTING

Shellac knotting shall comply with B.S 1336

A WHITE SPIRIT

The white spirit shall comply with B.S. 245.

B TIMBER STAIN

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Timber stain shall be oil based pigmented stain. The application of this material shall be strictly in accordance with the manufacturers written instructions. Tint and degree of application shall be to the approval of the Architect.

C STOPPING

The stopping shall be as follows:-

- i. Plasterwork shall be plaster based filler.
- ii. Concrete and brick work shall be similar material to the background and finished in a similar texture.
- iii. Internal woodwork, plywood and block board shall be putty complying with B.S.544.
- iv. External woodwork shall be white lead paste complying with B.S 2029.
- v. Internal clear wood finishes: the stopping shall be that recommended by the clear lacquer manufacturer.

D FILLERS

The fillers for internal joinery shall be the type recommended by the paint manufacturer for use with his type of paint or lacquer. Stopper and fillers shall be tinted to match the under coat, and shall be compatible with both undercoats and primers. All materials shall be used strictly in accordance with manufacturer's instructions.

E TEXTURED COATING

Textured coating is to be of proprietary manufacture approved by the architect and of an approved colour. Technical information concerning the coating is to be submitted to the Architect before ordering, but the minimum qualities of the coating are to as follows:-

- i. Suitable for application internally and externally, plastered, rendered, concrete, block stone, brick, asbestos and timber surfaces.
- ii. Minimum durability of 10 years even in exposed conditions
- iii. Maintenance free
- iv. Built- in mould resistant fungicide.

WORKMANSHIP

A GENERAL

Workmanship generally shall be carried out in accordance with B.S.C.P 231, unless otherwise specified. Before painting is commenced floors shall be swept and washed over; surfaces to be painted shall be cleaned before applying paint as specified, and all precautions taken to keep down dust whilst work is in progress. No paint shall be applied to surfaces structurally or superficially damp and all surfaces must be ascertained to be free from condensation, efflorescence, etc., before the application of each coat. No painting shall be

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carried out externally during humid, rainy, damp, foggy or freezing conditions or conditions where surfaces have attained excessively high temperatures or during dust storms. No new primed or undercoated woodwork and metal work shall be left in an exposed or unsuitable situation for an undue period before completing the process.

No dilution of paint materials shall be allowed except strictly as detailed by the manufacturer's own direction, either on the containers, or their literature, or with special permission of the Architect. For external work dilution of paints will not be allowed whatsoever. For internal work, where permitted by the Architect, undercoats may be thinned by the addition of not more than 5% thinners. Gloss finish shall not be thinned at all.

Metal fittings such as ironmongery etc., not required to be painted shall first be fitted and then removed before the preparatory processes are commenced. When all painting is completed the fittings shall be cleaned as necessary and refixed in position.

B BRUSHWORK

Unless otherwise specified, all primers and paints shall be brush applied. Written permission must be obtained from the Architect's if an alternative method of application is to be used.

C STOPPING AND FILLING

Unless otherwise specified by the manufacturer all primers and undercoats shall be stopped flush and rubbed down to a smooth surface with an abrasive paper and all dust removed before each succeeding coat is applied. Care shall be taken to prevent burnishing of the surface.

D STIRRING

Unless otherwise specified by the paint manufacturer all paint materials shall be thoroughly mixed and/or stirred before and during use, and suitably strained as and when necessary.

E INSPECTION

No priming coats shall be applied until the surfaces have been inspected and the preparatory work has been approved by the

Architect. No undercoats of finishing coats shall be applied until the previous coat has been similarly inspected and approved.

A. PAINT APPLICATION

Each coat of paint shall be so applied as to produce a film of uniform thickness. All paint shall be applied in accordance with the manufacturer's instructions. Special attention shall be given to ensure that all surfaces including edges, corners, crevices, welds and rivets receive a film thickness equivalent to that of adjacent painted surfaces.

B DRYING

All coats shall be thoroughly dried before succeeding coats are applied. Allow a minimum of 24 hours between application on any one surface, unless otherwise specified by the manufacturer.

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C UPRIMED WOODWORKS

Unprimed woodwork scheduled to be painted shall be rubbed down with abrasive paper and dusted off. Care shall be taken to prevent 'burnishing' of the surface. All knots and resinous areas shall be coated with two coats of knotting. Pitch on large, open unseasoned knots and all other beads or streaks of pitch shall be scrapped off, or if still soft, shall be removed with white spirit before applying the knotting. Apply one coat of priming to all surface, two coats to all end grain, to be subsequently painted. Backs of all wood frames in contact with concrete, brickwork, blockwork, and metalwork or similar materials shall be primed before fixing. After priming all joints, holes, cracks shall be stopped and filled, rubbed down and dusted off.

D PRIMED WOODWORK

Woodwork delivered primed shall be lightly rubbed down with abrasive paper, and dusted off. Touch up bare areas with a similar priming including open grained ends. After touch priming all joints holes, cracks and open grained ends shall be stopped and filled, rubbed down and dusted off.

E PLYWOOD AND BLOCKBOARD

Edges of exterior plywood and blockboard shall be sealed with two coats of aluminium primer and the backs treated with a lead primer.

F CLEAR FINISHED WOODWORK

All woodwork scheduled to receive a clear finish shall be well sanded with the grain removing all dirt etc., to give as smooth a surface as possible. Resinous timber shall be swabbed down with white spirit and dried thoroughly.

Split or end grain shall be filled with suitable filler recommended by the clear lacquer manufacturer in accordance with their instructions, and of the appropriate shade.

G BARE METALWORK

Bare metalwork shall be thoroughly cleaned off all dirt, grease, rust and scale by means of chipping, scrapping and wire brushing; particular attentions should be given to the cleaning of welded, brazed and soldered joints. Wash down with white spirit and wipe dry with clean rags. Apply a coat of metal primer immediately the cleaned surfaces have been approved by the Architect.

A GALVANIZED METALWORK

Galvanized metalwork scheduled for painting shall be thoroughly cleaned of dirt, grease dusted and washed down with white spirit and wiped dry with clean rags. Any minor areas of rust shall be removed by wire brushing and spot primed with a zinc rich primer. Apply at least one coat of calcium plumbate primer at all surfaces subsequently to be painted.

B PRIMED METALWORK

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If the priming coat of pre-primed metalwork has suffered damage in transit, or during erection on site, the affected areas shall be cleaned off by wire brushing abrading and dusting off, the bared patches touched up with a primer of a similar type to that already applied.

C COPPER

Copper scheduled for painting shall be lightly abraded with emery cloth, washed with white spirit and wiped dry with clean rags. Apply a coat of each primer immediately the cleaned surfaces have been approved.

D BRICKWORK, CONCRETE ETC.

All brickwork, blockwork, concrete, rendered and plaster surfaces scheduled to be painted shall be brushed down, all holes and cracks filled, all projections such as plaster or mortar splashes etc., removed to leave a suitable dust free surface. All traces of mould oil shall be removed from concrete surfaces by scrubbing with water, detergent and rinsing with clean water. All these surfaces shall be thoroughly dry before any primer or paints are applied. Apply a coat of alkali resisting primer where surfaces are to be finished with oil paints or alkyd type emulsion.

Asbestos cement surfaces scheduled for painting shall be brushed down to remove powdery deposits, and a coat of alkali resisting primer applied where such surfaces are to be finished with oil paints or alkyd resin type emulsion.

E COLOURS

The colour will, be selected by the Architect from the paint manufacturer's standard colour range.

F TOXIC WASH

Concrete, blockwork, plaster and timber surfaces which are to be painted shall be washed down prior to painting with a toxic wash applied by brush or spray. A second wash shall be applied two days after the first wash. The surfaces shall be then allowed to dry out completely before application of paint.

G PROTECTION

Proper care must be taken to protect surfaces while still wet by use of screens and 'wet paint' signs where necessary.

A DAMAGE

Care must be taken when preparing surfaces, or painting etc., not to stain or damage other work. Dust sheets and covers to the satisfaction of the Architects shall be used to protect adjacent work. Any such stains or damage shall be removed and made good at the Contractor's expense.

B CLEANLINESS

All brushes, tools ,pails, kettles and equipment shall be clean and free from foreign matter. They shall be thoroughly cleaned after use and before being used for different colours, types of classes of material.

Painting shall not be carried out in the vicinity of other operations that may cause dust. Waste liquids , oil soaked rag etc., shall be removed from the building each day. Waste liquids shall not be thrown down in any sanitary fittings or drains.

C PERFORMANCE

If, while the work is in progress, the paint appears to be faulty, such as consistency of colour, drying time, or quality of finish, the work shall be stopped at once and the manufacturer consulted.

The manufacturers of the materials shall be given every facility for inspecting the work during progress in order to ascertain that the materials are being used in accordance to their directions, and to take samples of their products from the site if they so desire for tests.

The finishing coats of the various paints or surface finishing shall be free from sags, brush marks, runs, wrinkling, dust, bare or ‘starved patches, variations in colour and texture, and other blemishes.

When the work has been completed, the finished surfaces shall not be inferior in quality, colour and finish to the samples approved by the Architect, and imperfections in manufacture shall not be apparent through these finished surfaces.

In the event that the Architect is not satisfied that the quality of finish does not comply with the required standards and/or the sample panel the contractor will be required to repaint at his own expense, such work to the satisfaction of the Architect. If in the opinion of the Architect it is necessary to remove completely the unsatisfactory paintwork this shall also be done under the direction of the Architect at the expense of the contractor.

D Packaging, Delivery and Storage

All paints and surface coatings shall be delivered in sound sealed containers, labelled clearly by the manufacturers, the label or decorated container must state the following:-

- (a) The type of product
- (b) The brand name and colour
- (c) The use for which it is intended
- (d) The manufacturer’s batch number
- (e) The B.S number if applicable
- (f) All labels shall be printed – containers bearing type written acceptabl

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Materials shall be stored under cover in accordance with the manufacturer's instructions, and with local fire and safety regulations. The store itself must be maintained at temperature of not less than 50 degrees f (10 degrees C) and must not be subjected to extreme changes of temperature.

A VINYL EMULSION PAINT

Surfaces to be painted shall receive one mist coat followed by two full coats of vinyl emulsion paint.

Application may be by means of rollers or brushes.

B GLOSS FINISH PAINT

Surfaces to be painted shall be primed then painted with two undercoats followed by one coat gloss finish paint.

C CLEAR POLYURETHANE VARNISH

Surface to be clear varnished shall be treated with two coats polyurethane varnish

D TEXTURED COATING

The manufacturer's instructions concerning application of the coating are to be strictly followed under the direction of the Architect. All surfaces to receive textured coatings are to be clean and dry with surfaces scrapped and brushed before application of the coating.

Application of the coating is to be with textured roller or fibre brush as directed by the Architect with a minimum spreading capacity of

1 kilogramme per square metre. Under no circumstances is the coating to be thinned.

PART TWELVE

PLUMBING SPECIFICATIONS

PLUMBING

GENERAL

A REGULATIONS ETC.

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

MATERIALS

B BLACK STEEL PIPE WORK

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

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

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

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All flanges shall comply with requirements of B.S. 10, to the relevant classifications contained hereinafter under section c of the specification.

C GALVANISED STEEL PIPEWORK

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

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

D COPPER TUBING

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

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

Short copper connection tubes between galvanised pipework and sanitary fittings shall not be used because of the risk of galvanic action. If, as may occur in certain circumstances, it is not possible to make the connections in any other way than by the use of copper tubing, then a brass straight connector shall be positioned between the galvanised pipe and the copper tube in order to prevent direct contact.

A CAST IRON PIPEWORK

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

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

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

B ASBESTOS CEMENT PRESSURE PIPES

Where asbestos cement pressure pipes and fittings are used in connection with external, above, ground or buried water services, they shall be manufactured in accordance with the requirements of B.S 486.

The classification of these pipes falls into four classes:

A., B., C., and D, respectively, and the class to be used shall depend upon the pressure conditions pertaining at site.

Where cast iron detachable joints are used by connecting pipes, the material shall comply with B.S 1452 and be suitably protected with a non-toxic compound against corrosion.

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When jointing components are made in any other material for which there is no B.S specification, then the materials used shall be of quality not less than that required by this standard.

Rubber jointing rings shall be used for sealing purposes and shall comply with the requirements of B.S 2494, except where they are likely to be contaminated by the oil products, in which case the gaskets shall be manufactured in accordance with B.S 3514.

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

All P.V.C pipes and fittings shall be manufactured in accordance with B.S 3505 1968.

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

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

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

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

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

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

A A.B.S. WASTE SYSTEM

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

Pipes, traps and fittings shall be in accordance with the relevant British standards, including B.S 3943, and fixed generally in accordance with manufacturer's instructions, and B.S 5572:1978.

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

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

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

B. P.V.C SOIL SYSTEM

The sub-contractor shall supply and fix P.V.C soil pipe and fittings as indicated on the drawings and schedules. Pipes and fittings shall be in accordance with relevant British Standards, including B.S 4514, and fixed to the manufacturer's instructions, and B.S 5572.

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

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

Suitable supporting brackets and pipe clips shall be provided at maximum of one metre centres. The sub-contractor shall be responsible for the joint into the Gully Trap and Drain as indicated on the drawings.

VALVES

A DRAW-OFF TAPS AND STOP VALVES (UP TO 50 MM NOMINAL BORE)

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

B GATE VALVES

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

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

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The pressure classification of all gate valves shall depend upon the pressure conditions pertaining to the site of works.

C GLOBE VALVES

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

3961.

The pressure classification of all globe valves shall depend upon the pressure conditions pertaining to the site of works.

D CHECK OR NON-RETURN VALVES

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

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

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E BALL VALVES

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

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

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

A MANUALLY OPERATED MIXING VALVES

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

WASTE FITMENTS TRAPS

B STANDARD AND DEEP SEAL P & TRAPS

Where standard or deep seal traps are specified they shall be manufactured in suitable non-ferrous materials in accordance with the full requirements of B.S 1148.

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

C ANTI-SYPHO TRAPS

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

PIPES SUPPORTS

D GENERAL

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

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

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

The sub-contractor shall supply and install all steelwork forming part of the pipe support assemblies and shall be responsible for making good any damage to builders work associated with the pipe support installation.

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

E STEEL AND COPPER PIPES AND TUBES

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

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

Size	Copper Tube	Steel Tub to
Minimal Bores	To B.S 659	B.S 1237
15mm	1.25	2.0m
20mm	2.0m	2.5m
25mm	2.0m	2.5m
40mm	2.5m	3.0m
50mm	2.5m	3.0m
65mm	3.0m	3.5m

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

A CAST IRON AND ASBESTOS CEMENT SPIGOT SOCKOT JOINTED PIPES

Cast iron and asbestos cement socketed pipes shall generally be supported at every socket joint by means of either

Cast iron and Asbestos cement spigot socket Jointed pipes

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holder bats secured rigidly to the structure, or purpose made straps for attachment to rigid steel support brackets. When holder bats are used, they shall conform to the requirements of B.S 416.
Suitable anchors shall be provided at all changes of pipe directions, junctions and tees, to counteract the effect of end thrust loads.

B. ASBESTOS CEMENT PRESSURE PIPES

Asbestos cement pressure pipes with either cast iron detachable joints or asbestos cement screw joints shall be supported and anchored on either side of the joint.

Pipe hangers and trapeze type supports shall not be suitable for the suspension of asbestos pressure pipes unless they are designed with suitable restrictions to prevent swinging while at the same time providing the necessary support requirements.

Within building, asbestos pressure pipes shall be carried either on concrete supports or on rigidly fixed steel wall brackets. Suitable anchors shall be provided at all changes of pipe direction, junctions and tees to counterpart the effect of end thrust loads.

A EXPANSION JOINTS AND ANCHORS

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

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

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

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

B JOINTING PIPES

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

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

Before making any joints, all jointing surfaces shall be thoroughly cleaned and dried and maintained in such condition until the joints have been completely made or assembled.

Notwithstanding any flexibility provided in the pipe joints, pipes must be securely positioned to prevent avoidable movement during and after the making of the joint. The space between the end of the spigot and the shoulder of the socket of flexibly jointed pipes when jointed shall be as recommended by the manufacturer or ordered by the Engineer.

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

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

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

A CAST IRON JOINT FITTINGS

Cast iron detachable joint collars and flanges shall be tested by striking lightly with a spanner immediately before they are placed and if they fail to ring true shall be set aside and not incorporated in the work until proven sound. The flanges shall be correctly positioned and the component parts including any insertion ring cleaned and dried.

Insertion rings shall be fitted smoothly to the flange without folds or wrinkles. The face and bolt holes shall be brought fairly together and the joints shall be made by gradually and evenly tightening bolts in diametrically opposed positions. Only standard length spanners shall be used to tighten the bolts. The protective coating if any, of the flange shall be made good when the joint is completed.

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Bolts threads shall be wrapped with PTFE tape where directed before use. No washers shall be used on flanged pipework to be laid below ground. Bolts shall be as specified and shall be of the correct length, leaving a maximum of two threads exposed.

B SOLVENT WELDED JOINTS

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

Excess solvent cement shall not be applied to the inside of the pipe socket and all surplus solvent shall be removed from the joint and the pipe. Any solvent falling on the trench formation shall be removed by excavating the contaminated soil.

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

CONNECTIONS

C CONNECTION OF TUBING TO COLD STORAGE TANKS, HOT WATER CYLINDERS AND SANITARY FITTINGS

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

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

All sanitary-ware and fittings shall be left in a clean and good condition to the satisfaction of the Engineer. All fittings shall be fixed in accordance with the manufacturer's instructions and shall comply with the general requirements of B.S. code of practice 305 and the particular requirements of the latest applicable B.S specification.

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

A. PIPE SLEEVES

Main runs of pipework are to be fitted with sleeves where they pass through walls and floors. Generally the sleeves shall be of PVC. Except where they pass through the structure, where they shall be mild steel. The

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sleeves shall have 6 mm – 12 mm clearance all around the pipe, or for insulated pipework all around the insulation. The sleeve will then be packed with slag wool or similar.

B CUTTING PIPES

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

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

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

Pitch-impregnated fibre pipes shall be cut by saw and where necessary the end shall be filled or machined to the required 2 degrees taper. Concrete pipes shall be cut to a square and even finish without splitting or fracturing the wall for the pipe. Reinforcement shall be cut back flush with the concrete and bare metal protected with bituminous paint or cement grout as directed.

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

C PIPES BUILT INTO STRUCTURE

The outside surface of pipes

D PIPES BUILT INTO STRUCTURE

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

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form a key for concrete or mortar. Sheathing to steel pipes shall be cut away from the sections to be building and after erection the protection shall be completed by applying approve bituminous material around the barrels of pipes of the junctions with structures.

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

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

A SETTING VALVES

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

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

All valves shall be set so that operating spindles are truly vertical unless otherwise detailed or directed. Every stuffing box shall be examined when the main is charged with water and leaking boxes shall be adjusted or replaced with square plaited lubricated hemp packing of approved manufacturer. The stuffing box shall not be so tightly packed as to materially affect the friction of the packing on the spindle. No air valve shall be stored before erection in the open in sunlight, or upside down to expose the balls and air cavities. Air valves shall be checked before the main is charged to ensure that the balls and faces are not scored or split and that that all passage ways are clean. The installation of special types of valve and

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metering equipment must be strictly in accordance with the manufacturer's instructions. The direction of opening of the valve shall be indicated on the headstock and on the underside of hydrant covers.

Fire hydrants, frost plugs and similar fittings shall be checked before being incorporated in the line and before the main is changed to ensure that all passageways are clean. The installation of special types of valve and metering equipment must be strictly in accordance with the manufacturer's instructions.

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

A PRESSED STEEL PLATE STORAGE TANKS

The water capacity of the tanks and the diameter of all pipes and pipe connections therewith will be as detailed on the Drawings and Bills of Quantities. Unless otherwise detailed the proportions of a tank will be such that the height is not less than three quarters of the length and not less than the width. All dimensions must be approved by the Engineer.

Elevated pressed steel plate storage tanks will comply with B.S 1564 and will be constructed of 4.76 mm (top row only) and 6.35 mm thick galvanised pressed steel tank plates, 1.22 mm or 1.00m square nominal size, embossed and with external flanges bolted together. Where detailed in the sub-contract the tank will be partitioned centrally, the division wall to be adequately stayed to permit emptying of either half of the tank whilst maintaining full water depth in the other half.

The tank will be complete with a pitched or vaulted cover and gable ends of 3 mm thick steel plates lap jointed and supported on bearers and gable end frames respectively; No. 75 mm square access manhole with hinged insect proof cover, 1 No. Float operate water level indicator; and will be provided with internal and external ladders as follows. Where the tank is constructed to operate in two halves 2 No. Access manholes and internal ladders will be provided.

The external ladder will have 40 mm x 6 mm mild steel flat stringers with 12 mm diameter mild steel rungs and will be cleated to the tank at 1.2m intervals. The stringers will be taken 750 mm above the tank cover and bent to return to the cover of a distance of 450 mm from the edge. This ladder will be complete with 40 mm x 3 mm mild steel flat safety hoops of 600 mm diameter, space at 1.2 m vertical centres, truly bent and welded to the stringers. The safety hoops will be joined by 3 No. 40 mm x 3 mm mild steel flat vertical guard strips, evenly spaced and flat fillet welded to the hoops.

The internal ladders will have 65 mm x 12 mm steel flat stringers with 20 mm diameter mild steel rungs and will be cleated to the tank at 1.2m intervals.

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The tank bottom plates will be provided with a single pipe pad for the washout pipe connections and double pipe pads for all other pipes which pass through the bottom of the tank. The tanks will be provided and erected complete with all bolts, nuts, washers, internal braces and approved non-toxic jointing materials (fibre-glass or bitumen impregnated filler strip or approved equal).

The whole of the tank steelwork and plates will be galvanised as specified before dispatch and after erection, painted with an approved etching primer and two coats of a bitumen based aluminium paint externally and two coats of non-toxic black bitumen paint internally, both as specified.

The tank after final erection on its permanent foundation will be filled with water to overflow level for a period of 24 hours. Any leaks which become apparent will be made good to the satisfaction of the Engineer before acceptance of the work. Both halves of the tank will be tested separately.

B PIPEWORK FOR PRESSED STEEL TAN

All pipework associated with the tank and stand will be mild steel pipe to B.S 534 with flanged joints. The pipework will comprise one bellmouthed standing inlet pipe at designed top water level, one outlet pipe with bell-mouth and approved strainer to take water from the level as detailed on the Drawings. Where not detailed the outlet pipe will take water from not less than 75 mm above the tank bottom. One belmouthed standing overflow pipe with its lip 50 mm above designed top water level, and one washout pipe which will be capable of completely draining the tank will be provided. Where the tank is constructed to operate in two halves the inlet, outlet overflow and washout pipes will be duplicated in each half of the tank

ABOVE GROUND INSTALLATION

A GENERAL

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

B WATER SERVICES

Before any joint is made, the pipes shall be hung in their supports and adjusted to ensure that the joining faces are parallel and any falls which shall be required are achieved without springing the pipe. Where falls are not shown on the contract Drawing or stated elsewhere in the specification, pipework shall be installed parallel to the lines of the buildings and as close to the walls, ceilings, columns etc. As is practicable.

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

Screwed piping shall be installed with a sufficient number of unions to facilitate easy removal of valves and fittings, without the need to cut the pipe. Full allowance shall be made for the expansion and contraction of pipework precautions being taken to ensure that any force produced by pipe movements are not transmitted to valves, equipment or plant.

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

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

C SANITARY SERVICES

Soil, waster and vent pipe systems shall be installed in accordance with the best standards of modern practice as described in B.S

5572 to the approval of the Engineer.

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

The sub-contractor shall provide all necessary rodding and inspection facilities within the draining system in position where easy accessibility is available. Where a branch requires rodding facilities in a position to which normal access is unobtainable, then that branch shall be extended so as to provide a suitable purpose made rodding eye in the nearest adjacent wall or floor to which easy access is available. The vent stacks shall terminate above roof level and where stack passes through roof, a weather skirk shall be provided.

The sub-contractor shall be responsible for sealing the roof after installation of the stacks. The open end of each stack shall be fitted with a plastic coated, or galvanised steel, wire guard. Access for rodding and testing shall be provided at the foot of each stack.

A SANITARY APPLIANCES

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All sanitary appliances associated with the sub-contract works shall be installed in accordance with the best standard of modern practice as described in C.P. 305 to the approval of the Architect.

TESTING AND INSPECTION

SITE TESTS – PIPEWORKS SYSTEMS

B UNDERGROUND WATER MAINS

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

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

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

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

C ABOVE GROUND INTERNAL WATER SERVICE INSTALLATION

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

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

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

The sub-contractor shall take all necessary precautions to prevent damage occurring to special valves and fittings during the tests. Any item damaged shall be repaired or replaced at the sub-contractor's expense.

A ABOVE GROUND SOIL WASTE AND VENTILATION PIPE SYSTEM

All soil, waste and ventilating pipe system forming part of the above ground installation, shall be given a smoke test to a pressure of

38 mm of water gauge and this pressure shall remain constant for a period of not less than three minutes.

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

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

Any defects revealed by the tests shall be made good by the sub-contractor and the test repeated to the approval of the Engineer. In all other respects, tests shall comply with the requirements of B.S 5572.

B SITE TEST – PERFORMANCE

Following satisfactory pressure tests on the pipework systems, operational tests shall be carried out in accordance with the relevant

B.S code of practice on the systems as a whole to establish that special valves, guages, controls,

fittings, equipment and plant are functioning correctly to the satisfaction of the Engineer. All hot water pipework shall be insulated with performed fibre glass sectional lagging to thickness of 25 mm.

Cold water pipework shall be installed with performed fibre glass lagging to a thickness of 25 mm where the pipe runs above a false ceiling or in areas where the ambient temperature is higher than normal with the result that pipe sweating, due to condensation will cause nuisance. All lagged pipes which run in a visible position after erection shall be given a canvas cover and prepared for painting as follows:-

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

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

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

The test pressure shall be applied by means of a manually operated test pump or, in the case of long main or mains or larger diameter, by a power driven test pump which shall not be left unattended. In either case precautions shall be taken to ensure that the required pressure is not exceeded. Pressure gauges should be recalibrated before the tests. The sub-contractor shall be deemed to have included in his price for all test pumps, and other equipment required under this clause of the specifications.

The test pressure shall be one and a half times the maximum working pressure except where a pipe is manufactured from a material for which the relevant B.S specification designates a maximum test pressure as in the case of cast or spun iron pipes, where the test pressures should not exceed 120, 180 and 240 metre/head of clause B,E or D pipes, respectively.

A STERILIZATION OF HOT AND COLD WATER SYSTEMS

All underground water mains and above ground water distribution systems, cisterns, tanks, calorifiers, pumps, etc, shall be thoroughly sterilized and flushed out after the completion of all tests and before being fully commissioned for handover. The sterilization procedures shall be carried out by the sub-contractor or specialist employed by the sub-contractor in accordance with the requirements of B.S. code of practice 310, clause 409, to the approval of the Engineer.

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON LR. 27425
PART THIRTEEN**

SPECIFICATIONS DRAINAGE DRAINAGE

GENERAL

A. REGULATIONS ETC.

The whole of the drainage is to be executed by a registered plumber and drainlayer in strict accordance with the Regulations of local Authorities and to the satisfaction of the Architect.

B. CEMENT, SAND ETC

The description of material and workmanship contained in the foregoing sections shall apply equally hereto.

MATERIALS

C. PITCH FIBRE PIPES

All pitch fibre pipes and fittings for external services shall be manufactured in accordance with the requirements of B.S 2760. Pipes shall be connected by means of purpose made tapered joints manufactured in accordance with B.S 2760.

D. PRECAST CONCRETE PIPES

Precast concrete pipes for surface water and sewage shall comply with the requirements of B.S. 556 class 1. Where flexible spigot and socket type of flexible rebated type joints are specified, rubber gaskets complying with the requirements of B.S 2494 shall be used except where oil products are likely to be present, in which case gaskets shall comply with the requirements of B.S 3514.

Where ordinary spigot and socket type ordinary rebated type joints are specified, the joints shall be made with a cement mortar mix. Porous concrete pipes shall comply with the requirements of B.S 1194.

E ASBESTORS CEMENT PIPES

Asbestos cement sewerage pipes and fittings shall comply with the requirements of B.S 3656 with asbestos cement sleeve joints with rubber rings complying with the requirement of B.S 2494 class C.

F. CAST IRON PIPES

Cast iron drain pipes for building drainage shall comply with the requirements of B.S 437. Fittings for cast iron pipes shall comply with the requirements of B.S 78 or B.S 2035. Pipes and fittings will be coated internally and externally with an approved bituminous composition, except those parts to be encased in concrete which shall be coated internally only in the concrete area.

A CLAY PIPES

Clay pipes and fittings for sewerage or surface water shall comply with the requirements of B.S 65 and B.S 540 with Type 1 sockets and supplied complete with the manufacturer's flexible joint.

Clay pipes for use in the construction of french drains shall be British surface water pipes glazed or unglazed manufacture in accordance with B.S 65 and B.S 540 with Type 2 sockets or plain ended and supplied with sleeve couplings. Type 1 socketed and sleeve coupled pipes shall be perforated.

B P.V.C DRAIN PIPES

P.V.C drain pipes and fittings shall comply with the requirements of B.S 4660:1973.

C PRECAST CONCRETE MANHOLES

Concrete manhole ring sections shall be unreinforced ogee jointed complying with the requirements of B.S. 556. Shaft and chambers slabs shall be either mild steel reinforced heavy or light duty type, as specified.

D PRECAST CONCRETE OPEN CHANNELS

Precast concrete invert and sideblocks shall be of dense precast concrete free from cracks and spalls. The concrete used shall be nominal 1:2:4 mix.

Precast concrete invert and side blocks shall be cast in steel moulds. All arrises shall be true well defined.

E GULLIES

Precast concrete gullies shall be unreinforced and shall comply with the requirements of B.S 556.

Glazed ware gullies shall comply with the requirements of B.S 539. Cast iron gullies shall be of approved manufacture and shall conform with the dimensions and weight specified.

Gulley gratings and frames shall comply with the requirements of B.S 497.

F MANHOLE COVERS AND FRAMES

Manhole covers and frames shall be of cast iron in accordance with the requirements of B.S 497.

G MANHOLES LADDERS

Manhole ladders and fixings shall be of galvanised mild steel. The steel shall be mild steel grade 43 in accordance with B.S 4360 and shall be galvanised after manufacturer has been completed.

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON LR. 27425
H MANHOLE SAFETY CHAINS

Manhole safety chains shall be of 10 mm galvanised mild steel short link chain and will comply with the requirements of B. S. 590.

One end of the chain shall securely attached to 16 mm diameter galvanised mild steel eyebolt and the other end shall have a galvanised hook of attaching to a similar eyebolt.

A MANHOLE STEP IRONS

Manhole step irons shall comply with the requirements of B.S 1247. For brick or block manholes, step irons shall be of galvanised malleable cast iron general purpose pattern with 230 mm long tails complying with the requirements of B.S 556.

B FILTER BACKFILL MATERIAL

Filter backfill material for field or French drains shall consist of hard clean rock, crushed slag or gravel having a grading within the limits given below for Type 'D' or 'E'. The aggregate crushing value of the material as determined by the tests in B.S 8.2 shall not exceed 30%. The material passing 420 microm sieve shall be non-plastic when tested in accordance with B.S 1377.

Sieve Sized	Percentage by passing	Weight
Type 0	Type E	
63 mm	-	100
37.5mm	100	85-100
20mm	-	0-20
10mm	45-100	0-5
3.35mm	25 - 80	-
600 microns	8 - 45	-
75 microns	0 - 10	-

WORKMANSHIP

C UNDERGROUND PIPELINES

The contractor shall construct the pipelines using the designs of pipe, bed, haunch and surround details on the drawings.

'Rigid pipes' shall mean pipes of cast or spun iron concrete, asbestos cement, clay or similar materials.

'Flexible pipes' shall mean pipes of steel PVC or other plastic, pitch fibre, ductile iron or similar materials.

‘Rigid joints’ shall mean joints made by bolting together flanges intergral with the barrels of the pipes, by welding together the barrels of the pipes by caulking sockets with non-deformable materials, such as cement mortar, run lead or by similar techniques.

‘Flexible joints’ shall mean joints made with factory made jointing materials, loose collars, rubber rings etc., and which allow some degree of flexing, however small, between adjacent pipes.

A TRENCH EXCAVATION

Trenches for pipes other than those forming part of a field or french drain shall be excavated to a sufficient depth and width, subject to the following restrictions, to enable the pipe, joints, bed, haunch and surround to be accommodated.

From the bottom of the trench to a level 300 mm above the crown of the pipe trench widths shall not be less than the minimum nor greater than the maximum figures shown in the Table A.

Battering the sides of trenches shall only be permitted above this level where approved. The minimum width of trench shall be used for measurement purposes.

Table A- pipe Trench widths

Nominal Interna Diameter (mm)	Min.Trench Width(mm)	Max.Trench Width (mm)
100	430	630
150	500	700
200	550	750
225	580	780
300	680	880
375	950	1150
400	1000	1200
450	1030	1230
525	1120	1320
600	1240	1440
675	1330	1530
750	1400	1600
825	1490	1690
900	1920	2120
1250	2100	2300
1200	2290	2490

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Above 1200	Outside dia. Of	Outside dia.
Above 1200	Pipes plus 800 mm	of pipes plus
		1000mm

All sheeting and supports are to be out with the minimum width stated.

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

The contractor shall fill up with well compacted granular bedding material with 1:2:4 mix concrete where ordered by the Architect, any excessive depth or trench arising from his method of working.

Where the trench formation is in ground that, in the opinion of the Architect, is too soft to afford proper support to the pipes, either

- i. The trench shall be excavated down to solid ground and the extra shall be refilled with lean mix concrete, granular bedding material, gravel or broken stone, as the Architect directs, well compacted to form even bed or:
- ii. The pipe shall be supported by facines, piles or such other means as the Architect may direct.

The contractor shall avoid unduly disturbing the finished trench formation and shall make good disturbed areas and excavate any wet or puddled material which might result from his failure to do so. Voids shall be made good as the previous clause.

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

The material excavated in forming pipelines shall if unsuitable be run to spoil and replaced with suitable materials as so defined. Suitable material shall be set aside for use as backfill. Unsuitable material shall comprise all material such as material from bogs, marshes, swamp peat, logs, stumps, perishable material, clays having a liquid limit exceeding 80 or a plasticity content greater than 30% of the dry weight.

All surplus excavated material shall be disposed of to spoil hips provided by the contractor.

A PIPELAYING – GENERAL

On arrival at the site, pipes shall be carefully inspected for damage ends, cracks or other defects and any found to be faulty shall be marked and set aside for a decision from the Architect as to their acceptability. Pipes with damaged ends shall be either completely replaced or have the ends to the extent, and trimmed, as directed by the Architect.

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

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

Flat braided wire slings or band slings shall be used for slinging all pipes except externally coated pipes and plastic pipes for which only special band slings not less than 300 mm wide shall be used. Chain or rope slings, hooks or other devices working on scissors or grab principles must not be used.

Subject to the requirements of inspection before acceptance protective bolsters, caps or discs on the ends of flanges, specials or fittings shall not be removed until the pipes, special or fittings are about to be lowered into the trench.

Before a pipe is lowered into the trench it shall be thoroughly examined to ensure that the internal coating or lining and the outer coating or sheathing are undamaged. Where necessary the interiors of pipes, specials and fittings shall be carefully brushed clean.

Any damaged parts of the coatings or lining shall, before a pipe is used, be made good as directed.

Pipelaying shall not commence until the bottom of the trench and the pipe bed have been approved.

Flexible pipes, rigidly jointed, may be joined on the ground surface before lowering into the trench. All joints shall be supported by slings as the pipes are lowered and the pipe-line must not be deformed to a greater extent than recommended by the manufacturer.

Pipes must be brought to the correct alignment and inclination, concentric with the pipes already laid.

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All pipes less than 600 mm in diameter with flexible joints must be accurately marked prior to laying to ensure that the correct gap is left in the joint. An indelible mark shall be made on the spigot end on top of the pipe barrel to the depth of the socket less the detailed or specified joint gap. After correct jointing the mark should be flush with the face of the socket.

PVC pipes must be stored and handled carefully and must be in accordance with the manufacturer's recommendations.

A WITHDRAWAL OF SUPPORTS

During the placing of bedding, haunching, surrounding or anchoring material, temporary side supports and sheeting shall be removed except where directed to be left in and the full width of the trench will be infilled with bedding haunching, surrounding or anchoring materials.

B BEDDING AND PROTECTING PIPES – GENERAL

Bedding, haunching, surrounding and anchoring pipes shall be to the arrangement and dimensions shown on the drawings. A cavity of adequate size shall be excavated in the sides and bottom of the trench or left in the pipes bed at each joint and at each sling position.

The bottom of the trench or surface of the bed shall be finished to a smooth even surface at the correct levels to permit the barrel of the pipe to be solidly and evenly bedded throughout its whole length between joint and sling holes.

The preparation of the trench bottom or surface of the bed shall be completed for at least one full pipe length in advance of the pipe laying, except where in exceptional circumstances another arrangement is approved. No bedding material shall be placed in trenches containing water.

Where granular bedding is to be used, stones, bricks or similar materials shall not be used below or against the pipe to locate them in position in the trench or to level the pipes. Sufficient infill materials shall be placed around the barrels of pipes to prevent movement.

Where directed, puddle clay dams 500 mm thick shall be constructed around the pipe and across the trench as haunching and surrounding proceeds. The dams shall be at intervals not exceeding 30 metres or as directed and their height shall be determined by the Architect.

Where directed by the requirements for testing pipelines the method of haunching and surrounding pipes shall be modified to leave pipe joints exposed. Where there is a high ground water table all pipes shall be surrounded in an approved free drainage material.

A CONCRETE BEDDING, HAUNCHING, SURROUNDING AND ANCHORING

Concrete for bedding, haunching or surrounding pipes shall be 1:2:4 nominal mix concrete and no back filling of the trench shall be done until the concrete has reached a strength of 15 N.mm².

Before placing concrete, pipes shall be supported near each joint on a precast concrete block or on engineering bricks with a padding of two layers of hessian based damp proof course or material of similar yield between the barrel of the pipe and the supporting block. The surface of the support shall be perfectly smooth for at least 75 mm by 75 mm under the pipe, and the size of the blocks shall be as directed.

Concreting of bedding, haunching or surrounding shall not be done until the pipes have been jointed and inspected. The concrete shall be vibrated into place under the pipe and concrete shall be in full contact with the underside of the pipe throughout its length. The concrete shall be placed in one operation and shall be well worked form a homogeneous mass. There shall be no horizontal construction joint in the concrete below the level of the half pipe. The pipe shall be carefully anchored against flotation. Concrete beds, haunches and surrounds of pipes with rigid joints shall be formed in lengths not exceeding 10.0 metres which shall be separated by a soft wood joint filter 25 mm thick.

Concrete bedding, haunching pipes shall be discontinuous at flexible pipe joints. Shaped formwork made from fibreboard or other equally compressible material of the thickness stated in the contract and of size and shape equal to the next section of the concrete protection to the pipes shall be used and left at the pipe joint as shown on the drawings. The formwork shall be neatly cut and properly supported by temporary strut and rails where necessary.

PVC pipes shall be wrapped in polythene sheet or roofing felt about 2 mm thick before being haunched or anchored in concrete. Nominal 1:2:4 mix concrete shall be placed at all bends, tees, junctions, changes of direction and gradients to prevent movements of pipelines due to thrust from water pressure, in such positions and quantities as directed.

Concrete pipe anchorages and thrust blocks in trench shall be placed against undisturbed ground. Any loose or disturbed material shall be removed immediately before the concrete is placed.

Concrete anchorages to PVC pipes shall be placed to support half the circumference of the pipe. The pipe must not be encase. Where compliance with the requirement would result in concrete above the pipe, the

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anchorage concrete shall be placed beneath the pipe and the pipe will be restrained by straps as shown on the drawings.

A PLUG

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

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

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

Adequate precautions must be taken by way of backfilling or other means to anchor each pipe securely to prevent flotation of the pipeline in the event of the trench being flooded. No equipment, clothing or apparel must be left or sorted inside pipelines.

B JOINTING PIPES

Joints shall be made strictly in accordance with the manufacturer's instructions. The contractor shall make use of the technical advisory services offered by manufacturers for instructing pipe jointers in the methods of assembling joints. Where manufacturers recommend the use of special jointing tackles, the contractor shall use these for the assembly of all joints to pipes. Sockets shall be laid looking uphill unless otherwise approved.

Before making any joints, all jointing surfaces shall be thoroughly cleaned and dried and maintained in such condition until the joints have been completely made or assembled.

Notwithstanding any flexibility provided in the pipe joints, pipes must be securely positioned to prevent avoidable movement during and after the making of the joint.

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The space between the end of the spigot and the shoulder of the socket of flexibly jointed pipes when jointed shall be as recommended by the manufacturer or ordered by the architect. After flexibility jointed pipes, other than

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

Where loose collars are used to join pipes cut for closers, special tools shall be employed to keep the inside of the pipes flush and the collar concentric with the pipe while the joint is being made. Pipes provided with spigot and socket joints of the selfcentering, instantaneous joint type, such as the rubber ring push fit joint, shall be laid and jointed strictly in accordance with the makers instructions. Generally the joint ring shall be cleaned and inspected for cuts and defect, and socket spigot examined to ensure free recommended lubricant will be used.

A CAST IRON JOINT FITTINGS

Cast iron detachable joint collars and flanges shall be tested by striking lightly with a spanner immediately before they are placed and if they fail to ring true shall be set aside and not incorporated in the work until proven sound. The flanges shall be correctly positioned and the component parts including any insertion ring cleaned and dried.

Insertion rings shall be fitted smoothly to the flange without folds or wrinkles. The face and bolt holes shall be brought fairly together and the joints shall be made by gradually and evenly tightening bolts on diametrically opposed positions. Only standard length spanners shall be used to tighten the bolts. The protective coating, if any, of the flange shall be made good when the joint is completed. Bolts threads shall be wrapped with PTFE tape where directed before use.

No washers shall be used on flanged pipework to be laid below ground. Bolts shall be as specified and shall be the correct length, leaving a maximum of two threads exposed.

B CEMENT MORTAR JOINTS

The spigots and sockets of concrete pipes shall be thoroughly moistened before cement mortar joints are made. In making ogee joint to concrete pipes a thick layer of cement shall be applied to the butting faces, the pipe being laid shall be well driven against the other, and the jointed finished off inside, flush with the pipe wall.

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The outside of the joint shall be pointed up with a 75mm wide x 25mm thick mortar fillet all round and central about the joint. In making yarn and mortar joints for concrete and clay pipes, the spigot of the last pipe laid until it bears on the back face of the socket and shall be centred in the socket. Two turns of tarred yarn shall then be firmly caulked into the back of the socket with a proper caulking tool. Mortar consisting of 2 parts of sand to 1 part of cement shall then be pressed firmly into the joint to fill the socket completely and shall be neatly bevelled off at 45 degrees from the outside edge of the socket. Joints made with cement mortar shall remain exposed for at least 3 hours to allow for the initial set of the cement. All joints shall be examined and approved before the refilling of the trench is commenced.

C BACKFILLING TRENCHES

If the contractor allows material to become unsuitable, which when excavated was suitable for re-use, and it is unsuitable when required for backfilling, he shall run it to spoil and make good by replacing with suitable material.

Where required to meet the specification for testing pipelines, trenches shall be partially backfilled to provide anchorage, but joints shall be left exposed.

Backfilling shall whenever practicable be undertaken immediately the specified operations preceding it have been completed. No backfill material shall be placed in trench containing water.

In trenches in roads, verges and where shown on the drawings above 300mm over the crown of the pipe backfill, material shall be deposited in layers each not exceeding 225mm thickness and each compacted to 100% with a moisture content between with the moisture content between 0.8 and 1.05. M.C. Power rammers or vibrating plate compactors shall be used to compact the backfilling from one metre above the crown level of the pipe to the surface.

In trenches in fields or open country backfill material above 300mm over the crown of the pipe may be placed by machines provided the method of operation ensure that the materials slides or rolls into position and does not drop from a height.

The backfill material must not include any stones or boulder of dimensions exceeding 150mm in any position. Sufficient space shall be left to receive the original thickness of solid, turf or other materials removed from the surface. The surfaces shall be restored by replacing the materials in their proper order and form, and by compacting then to such a level as shall ensure that after settlement is complete the surface level of refilled trenches shall be within 30mm of that of the adjacent undisturbed ground.

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Where directed, trenches shall be backfilled with lean mix concrete made with 1kg cement to 12 kg aggregate. The aggregate will be as, clinker, gravel, stone or other hard material, approved by the architect, and free from sulphates, dust and other deleterious material.

A FIELD OR FRENCH DRAINS

Trenches for drains up to 150mm in diameter shall be excavated to a width of at least four times the normal diameter of the pipe; above 150mm diameter the width shall be the diameter plus 450mm.

Where shown on the drawings pipes for drains shall be bedded on a 75mm thickness of lean mix concrete which shall also be brought up until at least one-third of the depth of the pipe is supported and in the case of perforated pipes, no line of operations is thereby blocked. Non-circular pipes shall be bedded as shown on the drawings. Socketed pipes shall be laid with a space of about 12mm between the spigot and the inner end of the socket. Ogee jointed porous concrete and perforated clay pipes with rebated joints shall be dry jointed. Perforated pitch fibre pipes may be jointed with any of the joints specified in B.S.2760. Trenches for drains shall be backfilled with materials approved by the architect.

The pipes, the filter materials and the surface over drains shall at all times be kept free of obstructions.

B OPEN SURFACE WATER CHANNELS

Excavation shall be carried out generally as described for pipework. The invert shall be finished to a true line and fall and sides shall be trimmed to the slopes indicated.

Invert blocks and sides slabs shall be laid on a 100mm thick bed of suitable approved granular material formed and well compacted. They shall be jointed by thickly covering the joint face with mortar and driving the next unit firmly against that previously laid. The excess mortar squeezed out of the joint shall be neatly trowelled off. Channels ends shall be saturated with water and newly completed joints shall be protected and cured as for concrete pipes.

C MANHOLE INSITU CONCRETE

Manholes of insitu concrete will be formed as for blockwork manholes, the blockwork being replaced by insitu mass 1:2:4 nominal mix concrete.

Precast concrete manholes for sewers of up to 1200mm diameter shall be constructed as detailed on drawings using precast concrete component.

Manhole cover slabs may be cast insitu using reinforced nominal 1:2:4 mix concrete precast using reinforced nominal 1:1½:3 mix concrete.

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Unreinforced precast concrete chamber rings shall be surrounded with a minimum thickness of 150mm nominal 1:3:6 mix mass concrete as detailed on the drawings.

Step irons 230mm long shall be set into the external concrete surround to the manhole and the slots through the chamber rings filled with cement mortar.

A CHAMBERS

Chambers for access to valves and fittings on pressure pipelines for water or sewage, unless otherwise directed shall be constructed in concrete blockwork.

B SEPTIC TANKS

Septic tanks shall be constructed to the dimensions and general arrangement detailed on the drawings and in the contract. Tanks with blockwork shall be constructed as for manholes.

C TESTING FOR SEPTIC TANKS

Septic tanks and other chambers shall be tested by filing with water after completion of backfilling.

The first 1.0 metre of depth may be filled as quickly as the supply permits. Between this and top water level the rate of filling must not exceed 1.0 metre in 24 hours. After filling to top water level no further water shall be introduced for 2 days. At the end of this period the tanks shall be topped up to top water level and allowed to stand for 24 hours. The test shall be considered satisfactory if the fall in water level in 24 hours does not exceed 15mm.

In the event of a fall exceeding the above tank will be emptied and any defects made good prior to retest as before, all at the contractor's expense.

D CONNECTION TO SEWER

All connections to sewers are to be made with angle junctions set at the correct angle to minimize the use of bends. All angles shall not exceed 45 degrees.

The open ends of all house connections and other pipes not required for immediate use shall be sealed up with purpose made stoppers secured in position. The ends of connections and all junction positions will be clearly marked by posts and painted boards of a type and size to be approved by the Architect and the board shall be plainly marked with the letter 'S' and the size and depth below kerb level or ground level. A length of 4.5 mm galvanised iron wire shall be fixed to the face of the last pipe and the marking post. Every care shall be taken to prevent the marking boards being disturbed and the contractor shall take responsibility for their safety. The information shall also be painted on the kerbs in an approved manner when all works are complete and the contractor shall record the position of all branches fixing distances from the manhole immediately downstream of the branch.

A TESTING SEWER

Wherever possible, testing shall be carried out from manhole to manhole. Short branch drains connected to main sewer between manholes shall be tested as one system with the main sewer. Long branches shall be tested separately.

Pipes not exceeding 750mm nominal diameter shall be tested in one of the following ways:-

i. WATER TEST

A test pressure of 1.2 metres head of water above the soffit of the sewer shall be applied at the high end but not more than 6 metres at the low end by means of a stand-pipe. Steeply graded sewers shall be tested in stages where the above maximum head shall be exceeded if the whole section is tested in stages where the above maximum head shall be exceeded if the whole section is tested at once. A period of one hour shall be allowed for absorption. The loss of water over a period of 30 minutes shall be measured by adding water from a measuring vessel at regular intervals of 10 minutes and noting the quantity required to maintain the original water level in the standpipe. The average quantity of water added for sewers up to 300mm nominal bore must not exceed 0.06 litre per hour per 100 linear metres per mm of nominal bore of sewer. For sewers exceeding 300mm nominal bore the average quantity of water added must not exceed 0.12 litre per hour per 100 linear metres per mm of nominal bore of the sewer.

ii. AIR TEST

The length of sewer under test shall be effectively plugged and air pumped in by suitable means e.g. a hand pump, until a pressure of 100mm head of water is indicated in a U-tube connected to the system. The air pressure must not fall to less than 75mm head of water during a period of 5 minutes, without further pumping, after a period of 2 minutes for requisite stabilization.

Sewers will be tested:

- i. after laying and placing concrete if any but before backfilling over joints and
- ii. after backfilling has been completed.

Sewers constructed of steel, spun iron or other materials designed for high pressure shall be tested in accordance with the provisions of clause 33.00 below. Pipes exceeding 750mm nominal diameter shall be tested as required by the contract.

Where required by the contract the sewer shall be tested for obstruction by the insertion and pulling through of twin-coupled rubber plunges of the same diameter as the sewer.

Sewer shall be tested for infiltration after backfilling. All inlets to the system shall be effectively closed and the residual flow shall be deemed to be infiltration. The following limits of infiltration must be exceeded:-

- i. For sewers not exceeding 750mm nominal internal diameter, 0.08 litre per hour per 100 linear metres per mm of nominal bore of the sewer.
- ii. For sewer exceeding 750mm nominal internal diameter 0.16 litre per hour per 100 linear metres per mm of nominal bore of the sewer.

Infiltration to manhole must not exceed 5 litres per hour per manhole.

A MANHOLES AND CHAMBERS

Manholes and chambers shall be constructed in accordance with the drawings and specifications and in the positions as detailed on the drawings or directed by the Architect.

Pipes in and out of manholes are to be as short as practicable and shall be built in monolithically with the manhole and the manhole made watertight. Where line, level and pipe diameter permit and where approved by the architect, the pipeline may be laid broken through the manhole position subject to the pipe joints external to the manhole not exceeding 600mm from the inner face of the manhole wall.

The depth of the main channel must not be less than the diameter of the largest pipe. Where pipes have been laid unbroken through the manhole position the crown of the pipe shall be broken out to the half diameter over the full length of the manhole and the benching completed as directed by architect.

Branch bends shall be curved in the direction of flow and will be trowelled smooth with a steel float finish. Spaces between branch bends shall be completely filled with concrete and the faces above the main and branch channel inverts shall be trowelled smooth with a steel float finish.

Bases and benching shall be formed in 1:2:4 nominal mix concrete trowelled smooth with a steel float finish. Manholes inside buildings and elsewhere as shown in the contract shall have cast iron pipes with access openings and bolted cover plates with the requisite branches in lieu of open channels and branch bends. The bottom of the manhole shall be brought up in concrete to the underside of the cast iron cover plate of the access pipe and benched up at slope of 1:12 and trowelled smooth.

Manhole covers and frames shall be fixed in the position shown, the frame shall be solidly bedded in cement mortar so that generally the cover when in position are fair and even with the adjacent surfaces except where directed by the architect when they shall be kept 75mm above the adjacent surfaces. Where shown or directed frames shall be bedded on one or two courses of blockwork in cement mortar.

Step irons are not required where the depth to benching is less than 900mm and the diameter of the largest pipe is less than 450mm.

Channels more than 450mm in depth shall have one or more step irons in a recess, or toe holes and hand rail or post within easy reach, as detailed. A manhole shaft (excluding the 1-2 courses of blockwork under the cast iron cover) shall not be constructed unless the complete length shall exceed 1.0 metres.

Where depth from ground level to top of benching exceeds 4.5 metres a ladder may be used instead of a step iron where directed. Manhole ladders shall have brackets (not less than two pairs per ladder) of material equal to the stingers built into the blockwork or concrete at intervals of not more than 2.0 metres.

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In deep manholes suitable rest chambers shall be provided at about 6 metre intervals, each with a landing platform incorporating a hinged trap door immediately under the ladder as detailed in the contract.

Cover slabs of manholes shall be reinforced as shown on the drawings, minimum cover to steel 40mm, and the concrete shall be as detailed in the contract. All manholes on sewers of 600mm diameter and over shall be provided with safety chains across the mouth of the sewer on the downstream side and handholds or a 25mm solid bar handrail shall be provided on the edges of all benching platforms etc., as detailed or directed. The contractor shall supply two sets of lifting keys for each pattern of manhole cover incorporated in the work.

All manholes and chambers when completed must be watertight and to the satisfaction of the architect.

A CONCRETE BLOCKWORK MANHOLES

Concrete blockwork manholes for sewers up to 750 mm diameter shall be constructed as detailed on the drawings, using concrete blocks as specified laid in English bond beds and vertical joints shall be completely filled with mortar as the blocks are laid. External joints shall be flush pointed and internal joints shall be raked out to receive rendering as work proceeds. Cuts blocks shall only be incorporated when necessary for closures.

Where built into manhole walls, pipes of 375mm diameter and above shall have 150mm thick concrete relieving arches turned over to the full thickness of the blockwork. Where the depth of the invert exceeds 5.0 metres below the finished ground level the arch shall be 300mm thick. Walls of manholes up to 2.0 metres deep and up to 4.0 metres shall be increased in thickness to 400mm blockwork. Walls over 4.0 metres deep and upto 7.0 metres shall be 600mm blockwork and over 7.0 metres deep manholes shall be precast concrete or insitu concrete as directed by the architect. Overall manhole deep manholes shall be adjusted to the nearest half block size with the approval of the architect.

Manhole shafts shall be 750mm by 675mm and where ladders are used this size shall be increased to 825mm by 675mm with the shaft top corbelled as necessary.

Step iron having tail 230mm long shall be built in at 300mm vertical intervals as shown with the uppermost step iron from 60mm to 900mm from the top of the manhole cover as detailed.

PART FOURTEEN

ROAD WORKS SPECIFICATIONS

A. CLASSIFIED ROADS

All clasified roads shall be done in accordance with the "Standard Specification for Road and Bridge Construction 1996" (Published by the Ministry of Transport and Communication of the Republic of Kenya) except as supplemented, modified or revised in the specification of particular application.

B. UNCLASSIFIED ROADS

All unclassified roads shall be done in accordance with the specification given by the Design Engineer in the contract drawing except as amended, modified or revised in accordance with the contract.

C. CONCRETE BLOCK PAVING

1. Definition

- i. "Block paving" is the term applied to flexible surfacing consisting of precast concrete paving blocks laid on a laying course.
- ii. "Laying course" is the layer of material on which paving blocks are bedded.
- iii. "Surface course" is the layer of the precast concrete interlocking paving blocks.
- iv. "Edge restraint" is that part of the construction, such as a raised or flush kerb or channel, which prevents sideways movement of the blocks and prevents loss of material from the laying course.

2. Materials

a. Laying Course

Material for the laying course shall be naturally occurring sand or crushed rock fines with a grading curve falling within the following envelope:

Nominal Sieve Size (mm)	Percentage by mass passing (%)
10.00	100
5.00	95-100
2.36	80-100
1.18	50-85
600µm	25-60
300µm	10-30
150µm	5-15

PART FIFTEEN

A. ELECTRICAL MATERIALS AND WORKS REGULATIONS

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

All apparatus and materials supplied for all work carried out shall comply with the Kenya Government Electrical Specifications, GES 1 and GES 2, local statutory regulations and the Supply Authority By-Laws. Installations should also be in accordance with the requirements of the 14th Edition of the "Regulations of the Electrical Equipment of Buildings" issued by the Institute of Electrical Engineers of Great Britain, which should be used as a "Code of Practice", except where they conflict with Kenya Government Legislation regarding electrical installations and local amendments.

B. STANDARDS

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

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

C. RECORD DRAWINGS

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

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

A. CONTRACT DRAWINGS

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

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

Circular or square boxes shall be provided at all outlet points, unless otherwise specified and lighting fittings, ceiling switches and other accessories will be screwed to the internal lugs of the boxes. Care must always be taken when considering the use of totally enclosed fittings with polyvinyl chloride circular boxes where the

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temperature within the box is likely to rise above 60°C (140°F) special steel insert slips should be used in on junction with circular boxes where this problem can arise and also in situations where heavy pendants are used.

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

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

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

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

B. ARRANGEMENT OF CONDUIT LAYOUT

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

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

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

CEILING ROSES

A. TYPE

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

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

LAMP HOLDERS

B. TYPE

Lamp holders shall generally be of plastic construction with porcelain interiors, and bayonet fitting. Lamp holders for lamps rated 200 watts and above shall be of the Edison Screw type.

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

LIGHTING FITTINGS

C. GENERAL

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

D. FLUORESCENT FITTINGS

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

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

E. LAMPS

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

FLEXIBLE CORDS

A. TYPE

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

B. EARTHING

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

C. DISTRIBUTION SYSTEM EARTHING

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

D. TESTING OR EARTHING SYSTEM

The resistance of the earth continuity system, when measured between the main earthing point and any other point in the installation, including all conduit and other metal work which may provide path or earth, shall not exceed 0.5hm, if the earth continuity system is composed entirely of copper, copper alloy or aluminium.

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

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

E. WORKING DRAWINGS

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

- i. General arrangement drawings showing plants, M.V. Switchboards, distribution boards, consumer units, fittings, switch sockets, etc.
- ii. Layout drawings of concealed and surface conduits, ducts, trunking etc.

iii. Any other drawings that are not called for in the specifications.

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

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

A. LABELS

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

C. GALVANIZING

Galvanising shall be applied by the hot process and shall consist of smooth clean zinc coating free from defects can be in uniform thickness. The thickness shall not be less than 160gms of zinc per square metre of surface and tested in accordance with the requirements of B.S.729 where applicable. Sheradizing or other alternative processes shall not be used without approval in writing of the Engineer.

The preparation of galvanizing and the galvanising itself shall not adversely affect the mechanical properties of the coated material. Surfaces which are normally in contact with oil shall not be galvanised or cadmium plated. All out-door structures, access ladders, platforms, equipment cubicles shall be galvanised.

NON-METALLIC CONDUIT

D. STANDARDS AND INSTALLATION

All non-metallic conduit shall be class A heavy gauge, high impact, polyvinyl chloride complying with B.S.4606 Part 2, type AH.

The minimum size to be used on the contract is 20mm external diameter. All conduit installations shall be concealed in the walls and floors or in structural slabs.

JOINTS

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

a) Permanent Adhesives

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

b) Flexible Adhesive

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

A. BENDS

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

B. EXPANSION

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

Expansion couplers should be used in straight runs exceeding 6 metres with a loose or flexible type joint, (a. above then) at the long spout end of the coupler.

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

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

C. CLEANING AND PAINTING

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

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

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

- i. All interior surfaces of cubicles, kiosks, boxes and the like, containing wiring or other apparatus and internal components of the plant which are despatched to site in an assembled condition, shall be finished

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painted with at least two coats of white enamel. The final coat shall be of white anti-condensation finish, where so specified.

- ii. The external surface of the panels shall be finished in grey stove enamel to B.S.381 C shade 631 or other shade as may be approved by the Engineer.
- iii. All interior surfaces of tanks and other oil filled chambers and external surfaces of piping therein shall be painted finally with an oil resisting coating to the approval of the Engineer.
- iv. All wall and floor mounted junction boxes, loose starters etc., throughout the works shall be finished in grey stove enamel or painted to B.S.381 C shade 631 or other shade as may be approved by the Engineer.

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

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

DISTRIBUTION BOARDS

A. TYPE AND RATING

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

B. CONSTRUCTION

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

C. MINIATURE CIRCUIT BREAKERS

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

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

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

D. EARTH LEAKAGE CIRCUIT BREAKERS

If specified or indicated on the contract drawings, the use of E.L.C.B. for isolation of incoming supply in the distribution board, it shall be an approved type for flush mounting.

The general requirements of the E.L.C.B. are as follows:-

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

A. LABELLING

A circuit chart with each board shall show the name, location and current loading of each circuit connected. Each board shall be fitted with an engraved identification label in black and white, such as 'distribution board D.1.' etc., and all three phase boards shall be labelled in white or red, 'DANGER 415 VOLTS'

B. ERECTION

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

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

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

FINAL SUB-CIRCUIT WIRING

C. TYPE

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

D. INSTALLATION

Cables forming sub-circuits connected to different sub-distribution boards, shall not be drawn into the same conduit or draw-in box. Saddles as supplied by the manufacturers shall include a sliding support tolerance for longitudinal expansion.

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

A. SUPPORT

Conduit should be supported by saddles at not less than 900mm intervals. Where working temperatures tend to be high this should be reduced to 600mm.

B. CONDUITS BOXES AND FITTINGS

All conduit boxes shall be circular or square pattern or rigid polyvinyl chloride suitable for plain connections conforming to shed 61

B.S.4607 part. Boxes for supporting a fitting or accessory shall be fitted with a polyvinyl chloride lid held in position by means of two 2 BA round headed screws. Boxes shall have metallic screwed inserts.

C. P.M.E. SYSTEM

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

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

D. COMMISSIONING.

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The whole installation shall be tested to the statutory requirements of the Electricity Authority, Institute of Electrical Engineer Regulations and commissioned in the presence of and to the satisfaction of the Engineer. Four copies of test reports shall be provided within seven days of carrying out the tests, and the reports shall include full details of how each test was carried out, and a copy of all reading taken.

GENERAL

A. SOCKET OUTLETS

In all areas, general power outlets shall be of the 13amp. 3 pin fused plug type complying with B.S.1363. They shall be flush pattern, with white or ivory cover plates unless otherwise specified on the drawings. Where the circuits are supplied from a common feed, two outlets shall form a twin unit in a common box. The earthing terminal of every socket outlet shall be connected to the earth continuity conductor of the final sub-circuit by an appropriately sized insulated copper conductor. Unless otherwise stated they shall be mounted at 300mm above the finished floor level.

FUSED CONNECTION UNITS

A. GENERAL

All fused connection units shall be 13 amps. with fuse and neon indicator lamp. Boxes shall be flush type with white or ivory cover plates and shall be switched type unless otherwise specified on the drawings.

B. FUSES

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

C. LABELLING

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

LIGHTING SWITCHES

D. TYPE

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

Switches controlling points in bathroom shall be placed outside the bathroom or consist of a ceiling switch operated by a non-conducting cord, as specified switches mounted outdoors shall be of a weather tight pattern. Switches shall be one way, two ways or intermediate as specified and where a number of switches are mounted together, they shall be fitted in common box.

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

STREET LIGHTING

E. KENYA POWER AND LIGHTING SUPPLY

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

The electrical Contractor shall submit commencement and completion certificate and application for electrical supply to Kenya Power and

Lighting Company Limited and make all the arrangements for the supply to each control pillar.

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

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

A. STREET LIGHTING COLUMNS

Street lighting columns shall be steel columns conforming to B.S.1940/1952 having amounting height of 6.00 metres and shall be as shown on the drawings. The columns shall be installed at a minimum depth of 825mm in the ground on a 75mm thick concrete foundation.

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

B. LANTERNS

Lanterns shall be of the completely enclosed type with antivandal bowl designed for side entry mounting on brackets with a 37mm diameter plain tube. They shall be capable of accommodating one single 125 watt M.B.F./U lamp 3-slot lamp holder connected with heat resisting cable. The lanterns shall be of semi cut-off type with light output ratio not less than 70% and with incorporated control gear, complete with lamp. The lantern shall be as 'SIEMENS' Cat No.5NA 383 or equivalent approved by the City Engineer and the Consulting Engineer. If any alternative make is to be used the details shall be given at the time of submission of tenders.

C. CABLES

Polyvinyl chloride armoured copper conductors cables shall be 250/440 volt grade confirming to B.S.3346/61. 4mm² x 2-core, 3-core P.V.C. wapvc cables shall be used for street lighting installation as indicated on the drawings.

All cables shall be terminated with brass glands of suitable size to maintain proper earth continuity throughout the system.

D. DUCTS

Ducts for road crossing shall be concrete pipes joined in an approved manner, with all internal diameter of not less than 100mm. The ducts shall be laid at least 0.5metres below the finished road level on a compacted bed of concrete mix 1:3:6 and at least 150mm concrete surround.

E. CONTROL PILLAR

The control pillar shall be metal pillar conforming to drawings.

The control pillar shall be erected on 300mm thick bed of concrete mix 1:2:4 and a minimum of 225mm above ground level in the position indicated on the drawings. The control pillar shall be complete with time switch, switch-gear, cutouts, earth leakage current operated circuit breakers and all associated wiring. The control pillar shall be adequately earthed.

A. SYSTEM OF WIRING

Cables shall be 4mm² x 2-core, 2-core pvc laid with a layer of soft sand underneath and over in a trench 500mm deep along the road approximately 600mm deep across the road and approximately 600mm away from the road kerbs. The loop-in and loop-out arrangement shall be through a cut-out mounted in pole windows. Galvanised armoured wires shall be properly earthed and to maintain earth continuity earth clips and connectors to be used. From the cut-out to the lantern 1.5m² pvc insulated and sheathed twin and earth cables shall be used protected by 5A cartridge fuse. The lantern shall be earthed separately with earthwire taken from the main point. Cables crossing the road shall be laid in ducts previously specified. The cables laid in trench shall be protected with "HATARI" cable tiles.

No underground joints will be allowed.

B. EARTHING

All poles, lanterns and other metal parts shall be properly earthed. Electrical and mechanical continuity shall be pre-served throughout the whole systems from the control pillar to the remotest pole and the earth resistance must be efficiently earthed through earth electrodes by means of substantial copper clamps secured by non-rusting bolts. The lead must be visible and adequately protected. No earthing lead shall be less than 6mm² twin with earth wire may be used.

C. EARTH LEAKAGE CIRCUIT BREAKER

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The earth leakage circuit breaker shall be current operated as manufactured by `CRABTREE' Cat No.13030/1 with over-current and short circuit protection and shall conform to B.S.4293.68 rated at 240 volts 50HZ alternating current.

D. CONSUMER UNITS

These shall be surface mounted 6-way SPN MCB consumer unit as manufactured by `CRABTREE' Cat No.206/1 or equivalent with MCB

ratings as shown on the drawing. The minimum fixing position height above floor level for the units shall be 1.8 metres.

E. TESTING

The installation when complete shall pass the following tests:-

- a) Insulation resistance between lines and line/neutral.
- b) Insulation resistant between line and earth and neutral and earth.
- c) Earth continuity resistance including all fittings.
- d) Polarity check. Contractor shall submit a completion certificate to Kenya Power and Lighting Company Limited for electricity connection.

A. RESISTANCE

Test on earth electrode when carried out with earth (null balance) at any point within the network must not exceed 3ohms.

B. MAINTENANCE

The Contractor shall be responsible for maintenance of equipment for 12 months after substantial completion. He should allow his price for replacement of defective or burnt out lamps and other equipment.

All works to be carried out to the satisfaction of the Engineer. The Contractor shall be required to carry out all adjustments and improvements to meet the Architect's requirements at his own cost.

BILL NO. 03

PARTICULAR PRELIMINARIES.

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
	<u>BILL NO. 03</u>	
	<u>PARTICULAR PRELIMINARIES</u>	
A	<p>PRICING ITEMS FOR PARTICULAR PRELIMINARIES</p> <p>Prices shall be inserted against items of 'preliminaries' in the tenderer's priced Bill of Quantities. The Contractor is advised to read and understand all preliminaries. Preliminary items not priced shall be deemed to have been included in the rates of items in the Bill of Quantities.</p>	
B	<p>DESCRIPTION OF THE SCOPE OF WORKS.</p> <p>The works to be carried out under this Contract involve Proposed Sports fields facilities in Meru University of Science and Techology and all associate Services Works.</p> <p>The Sports Fields and support facilities shall consist of:</p> <ul style="list-style-type: none"> a) Soccer Pitch (with running track) b) Hockey Pitch A&B c) Basketball court A&B d) Rugby Pitch e) Tennis Court A, B& C f) Parking, Foot paths & Earth Drain. g) Swimming Pool h) Soccer Pitch A Pavilion i) Washrooms 	
C	<p>MEASUREMENTS</p> <p>In the event of discrepancy between the Bill of Quantities and the actual works, the site measurements shall generally take precedence. However, such discrepancies between any Contract documents shall immediately be reported to the Project Manager in accordance with Clause NO. 22 of the Conditions of Contract. The discrepancies shall then be treated as a variation and be dealt with in accordance with Clause 22 of the said Conditions.</p>	
D	<p>LOCATION OF THE SITE</p> <p>The site is located at Meru University on Plot No.27425 (Nchiru) Meru-Maua Road. The tenderer is advised to visit the site to familiarize him/her self with its nature and position as no claim will be entertained for lack of knowledge in this respect.</p>	
	TOTAL CARRIED TO COLLECTION	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
E	<p>CLEARING AWAY</p> <p>The Contractor shall remove all temporary works, rubbish, debris and surplus materials from the site as they accumulate and upon completion of the works, remove and clear away all plants, equipment, rubbish, unused materials, and stains and leave in a clean tidy state to the satisfaction of the Project Manager.</p> <p>The whole of the works shall be delivered up clean, complete and perfect in condition in every respect to the satisfaction of the Project Manager.</p>	
A	<p>CLAIMS</p> <p>It shall be a condition of this Contract that upon it becoming reasonably apparent to the Contractor that he has incurred losses and/or expenses due to any of the Contract Conditions, or by any other reason whatsoever, he shall present such claim or intent to claim notice to the Project Manager within the Contract period and in accordance with Conditions of Contract Clauses No. 19 and No. 24. No claim shall be entertained upon the expiry of the said Contract period.</p>	
B	<p>PAYMENTS</p> <p>Payment will be done on monthly basis by the Project Manager on application by the Contactor. All payments shall be made by Client Department upon certification by the Project Manager. Subcontractors shall be paid through the Main Contractor. The Main Contractor must confirm that they have paid subcontractors to be legible for subsequent certificates. The Project Manager reserves the right to pay subcontractors directly.</p>	
C	<p>PREVENTION OF ACCIDENTS , DAMAGE OR LOSS</p> <p>The Contractor is notified that the works are to be carried out on a fairly busy site where the Client is going on with other normal activities. He/she is therefore instructed to take reasonable care in the execution of the works so as to prevent accidents, damage or loss and disruption of normal activities being carried out by the Client. The Contractor is also notified all persons working therein will be vetted before admittance. Further, there may be restricted time operations without prior notice to the Contractor .The Contractor shall allow in his rates any expenses he deems necessary by taking such care within the site. NO claim will be entertained for failure to allow for this item.</p>	
TOTAL CARRIED TO COLLECTION		

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
D	<p>WORKING CONDITIONS</p> <p>The Contractor shall allow in his rates for any interference that he may encounter in the course of execution of the works for the Client may in some cases ask for stoppage of the works until some activities within the site are completed. The Contractor shall allow in his rates any expenses he deems necessary for such interference encounters.</p>	
E	<p>NO LABOUR CAMPS</p> <p>The Contractor shall not be allowed to house labour on site. Allow for transporting workers to and from site during the Contact Period.</p>	
F	<p>STORAGE OF MATERIALS.</p> <p>The Contractor is notified that there is no storage space on site and they shall procure material storage space elsewhere and in premises nearby the site for the entire construction period. The Contractor shall allow for the cost of the Procurement of storage space in their tender rates and no claim will be admitted for the failure to do so.</p>	
G	<p>PRICING NOTES</p> <p>The tenderer shall include for all cost in executing the whole of the works, including transport, replacing damaged items, fixing, all to comply with the said Conditions of Contract. The tenderer to note that this is a tender whereby the Main Contractor forms a consortia with relevant subcontractors in a regulated and controlled domestic arrangement of contract.</p>	
A	<p>SECURITY OF THE WORKS</p> <p>The Contractor shall allow for providing adequate security for the works and workers during the Contract. No claim will be entertained for lack of enough security in this respect</p>	
B	<p>URGENCY OF THE WORKS</p> <p>The Contractor should note that these works are very urgent and must be completed within the agreed contract period.</p>	
	<p>TOTAL CARRIED TO COLLECTION</p>	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
C	<p>PAYMENT FOR MATERIALS ON SITE</p> <p>All materials for incorporation in the works must be in the site stores before they are considered for payment, unless specifically exempted by the Project Manager. This is to include materials of the Main Contractor, Nominated Sub-Contractors and Nominated Suppliers. Payment of Furniture related materials on site shall only be made on furniture that is completely assembled on site.</p>	
D	<p>EXISTING SERVICES</p> <p>Prior to the commencement of any work, the Contractor is to ascertain from the relevant authority the exact position, depth and level of all existing services in the and he/she shall make whatever provisions that may be required by the authority for support, maintenance and protection of such services.</p>	
E	<p>PERFORMANCE BOND</p> <p>A performance bond in the form of unconditional bank guarantee or PPOA approved insurance company will be required is 10% of the bid price in accordance with clause No. 28 of the Conditions of Contract on award of contract. No payment on account for the works executed will be made to the Contractor until he has submitted the Performance Bond to the Project Manager duly signed, sealed and stamped from an approved bank.</p>	
F	<p>TENDER DOCUMENT</p> <p>Tender documents are listed in the Instruction to Tenderers and all documents in connection therewith, as specified above must be delivered in the addressed envelope which should be properly sealed and deposited at the offices as specified in the letter accompanying these documents.</p> <p>Tenders will be opened at the time specified in the letter accompanying these documents. Tenders delivered or received later than the above time will not be opened.</p> <p>The tenderer shall submit one original and one copy of the bid document.</p>	
	<p>TOTAL CARRIED TO COLLECTION</p>	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
G	<p>BID SECURITY</p> <p>A bid bond of Kshs.5,000,000.00 in form of Bank Guarantee from a reputable bank or PPOA approved insurance company shall be submitted together with the tender document. Any tender not accompanied by Bid Security stipulated shall automatically be disqualified.</p>	
A	<p>VALUE ADDED TAX</p> <p>The Contractor's attention is drawn to the Legal Notice in the Finance Act part 3 Section 21(b) operative from 1st September, 1993 which requires payment of VAT on all contracts. The Contractor therefore add VAT on the Rates as shown in the Grand Summary Page in the Bills of Quantities.</p>	
B	<p>WITHHOLDING TAX</p> <p>Withholding tax shall be deducted and shall be remitted to the Commissioner of Tax in accordance with the Law through all interim payments.</p>	
C	<p>CONDITIONS AND FORMS OF CONTRACT.</p> <p>The Conditions of Contract and Forms of Contract shall be as Section III and Section VIII of Standard Bidding Document annexed herewith in this Bidding Documents. These Conditions and Forms of Contract are available during working hours at the offices of the Project Manager.</p>	
D	<p>CONTRACT COMPLETION PERIOD</p> <p>The Contract Completion Period and terms of the Conditions of Contract must be strictly adhered to.</p> <p>The "PROJECT MANAGER" shall strictly monitor the Contractor's progress in relation to the progress chart and should it be found necessary, the "PROJECT MANAGER" shall inform the Contractor in writing that his actual performance on site is not satisfactory. In all such cases , the Contractor shall accelerate his rate of performance, production and progress by all means such as additional labour , plant e.t.c., and working overtime all at his cost.</p>	
	<p>TOTAL CARRIED TO COLLECTION</p>	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
A	PARTICULARS OF INSERTIONS TO BE MADE IN THE APPENDIX TO CONTRACT AGREEMENT	
B	The following are insertions to be made in the appendix to the Contract Agreement.	
(i)	Period of final measurement 6 Months from practical completion date	
(ii)	Defects Liability Period 6 Months from practical completion date for building works 12 Months from practical completion date for Civil Works. (Conditions of Contract Clause No. 20) All equipment to have a minimum of 1 (one) year warranty	
(iii)	Date for Possession To be agreed with the "PROJECT MANAGER" [Conditions of Contract Clause NO. 14)	
(iv)	Date of Completion The bidder to quote for the Construction Period along this guide line (Conditions of Contract Clause NO. 31).	
(v)	Liquidated and Ascertained Damages Conditions of Contract Clause NO. 27. Shall be Kshs.50,000/= per Calendar week.	
(vi)	Period of issuing Interim Certificates Monthly[Conditions of Contract Clause No. 23.1)	
	TOTAL CARRIED TO COLLECTION	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
	<p>(vii) Period of Honouring Certificates - Twenty eight (28) conditions of Contract Clause NO. 23.3]</p> <p>(viii) Percentage of Certified value retained 10%. (Conditions of Contract Clause No. 26)</p> <p>(ix) Limit of retention fund - 5% of Contract Sum [Conditions of Contract Clause NO. 26]</p> <p>(x) Performance Bond [Conditions of Contract Clause NO. 28].</p> <p>The Bond required shall be from an approved Bank Guarantee or from PPOA approved Insurance Company and shall be 10% of the Contract Price</p>	
A	<p>OFFICE FOR THE PROJECT MANAGEMENT TEAM</p> <p>The Contractor shall provide office for the Project Manager on site complete with necessary facilities where site meetings shall be held and the Contractor should allow for erecting and maintaining throughout the project period temporary site office size 20 x 5m long comprising 50 x 100mm cypress timber structure, flat roof covered with 30g corrugated iron sheets, 32g corrugated iron sheer clad walls, 100mm thick murrum floor well compacted and finished smooth with cement and sand (1:3) screed, timber doors, windows and all necessary office furniture (6No. Arm chairs, table, calendar, visitors and site instruction books).</p> <p>This office shall be arranged to accommodate Clerk of works and Site Meeting Room. Further the office of the Project Manager shall be separated from that of the Contractor and the Contractor shall be liable and responsible for the security of all papers and equipment contained in the office and shall supply necessary stationery listed below.</p> <p>The office shall be sited to the satisfaction of the PROJECT MANAGER and if the Contractor moves his own main site office during the course of the contract, he shall also move the Project Manager office to a site approved by the PROJECT MANAGER without payment.</p> <p>TOTAL CARRIED TO COLLECTION</p>	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
	<p>Toilet and washroom facilities, which will be conveniently attached to the offices to the satisfaction of the PROJECT MANAGER, together with a potable water supply and water- borne sewage disposal shall be provided for at the office. Provision of toilet paper, soap, and towels and cleaning of the above toilet and washroom together with the Project Team Leader's office shall be the responsibility of the Contractor, and has to be carried out at least once every day. No extra payment will be considered for cleaning and provision of towels etc.</p> <p>New furniture and equipment purchased from an approved furniture manufacturer including, but not limited to the following, shall be provided.</p> <p>1 No. Surveying equipment both level and theodolite, leveling staff riding rods and 50metre metallic or linen tape measure of approved quality and chainmen.</p> <p>2 No. Digital Camera with video capability of approved quality.</p> <p>2 Nos. Approved scientific electronic calculators</p> <p>1 No. Drawing board (size AO) and either Tee square or drafting machines.</p> <p>3 Nos. Approved triangular plastic metric scales.</p> <p>2 Nos. Set squares 45 degrees and 60 degrees.</p> <p>2 Nos. Protractors large (360@)</p> <p>3 Nos. Pencil sharpeners</p> <p>3 Nos. Letter punches</p> <p>3 Nos. Stapling machines with supply of staples</p> <p>6 Nos. Filing trays</p> <p>3 Nos. Waste paper baskets.</p> <p>1 No. Site meeting table purpose made for not less than 14No. Attendants with and including chairs to match.</p> <p>6 Nos. Chairs Mecol OC3 or equivalent.</p> <p>1 No. Cupboard - steel (1830 mm x 910 mm x 460 mm deep)</p> <p>3 Nos. Book cases.</p> <p>2 No. Steel filing cabinet (4 drawers)</p> <p>2No. Laptops complete with Architectural and Engineering packages to approval.</p> <p>1No. Engineering Printer to approval .</p> <p>2 Nos. Single pedestal desk (Mecol Hi line range or similar).</p>	
	TOTAL CARRIED TO COLLECTION	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
	<p>2 Nos. Swivel chair (Mecol OAC 220 or similar)</p> <p>1 No. Double pedestal desk (Mecol Hi line range or similar).</p> <p>1 No. Swivel chair (Mecol OAC 24 or similar)</p> <p>2 Nos. Fire extinguishers.</p> <p>1 No. First Aid Kit.</p> <p>The contractor will avail surveying equipment for the Clerk of Work /Project Team Leader. One of the rooms shall be the Site Meeting Room with and including sizeable table to accommodate and including minimum 14No. chairs .</p> <p>A sufficient and regular supply of all normal stationery and consumable equipment including note paper (headed and plain), envelopes, notebooks, calendars, and one day one page diaries, visitor's book, pencils, ball points and pens, ink, erasers, rover stamps and pads, paper clips, pins, and the like.</p> <p>The above furniture and equipment shall revert to the Contractor when no longer needed for the Contract at the practical completion. The Contractor shall within 4 weeks before commencement of the Works hand over to the Clerk of Work /Project Team Leader a fully completed, furnished and equipped office for the PROJECT MANAGER'S Representative.</p> <p>In the event, the above office is not completed within the stipulated time, the Contractor shall provide suitable temporary office space for the Clerk of Work/ Project Team Leader. The Contractor shall price for the Clerk of Work/Project Team Leader's office, equipment and maintenance as stipulated.</p> <p>A Include a Percentage sum for the Contractor's Cost and profit for maintenance of Project Manager's equipment and Stationery Supplies.%</p> <p>B Include a Percentage Sum for the Contractor's Cost and Profit for the above%</p>	
	TOTAL CARRIED TO COLLECTION	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
A	<p>NUISANCE</p> <p>The MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY shall continue to be operation during the Construction period. The Contractor shall not directly or indirectly or otherwise by himself or through his agents cause nuisance to users of the buildings, adjacent building or near the site or any way obstruct on going operation's should he do so he shall be directly responsible for such acts and any costs to compliance with this Clause shall have been deemed to be included in tender rates.</p>	
B	<p>APPENDICES</p> <p>The Appendices to the Bills of Quantities shall be regarded for contract purposes as part of the Bill and shall be read and construed with the appropriate sections of the Bills if contained therein</p>	
C	<p>SUFFICIENCY OF TENDER</p> <p>The Main Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices stated in the Bills of Quantities which rates and prices shall cover all his obligations under the contract and all matters and things necessary for the proper completion of the works.</p>	
D	<p>NO SUBCONTRACTING OF BUILDING WORKS.</p> <p>Subcontracting of building works will not be admissible under whatsoever circumstances.</p>	
E	<p>CLERK OF WORKS</p> <p>The contractor to allow Kenya Shillings One Million , Two Hundred thousand (Ksh. 1,200,000.00) only for the employment of a qualified Clerk of works herein after referred as C.O.W for the duration of the contract as will be directed by the project manager. The emoluments of the C.O.W and any other expenses including taxes, statutory deductions, annual leave and travels inclusive of any gratuities that may accrue shall be deemed to have been taken into account. The mode of payment shall be as per monthly and the amounts included in the scheduled interim certificates.</p>	1,200,000.00
F	<p>Include a percentage Sum for the Contractor's Cost and Profit for the above.....%</p>	
TOTAL CARRIED TO COLLECTION		

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
MOBILE TELEPHONE AND AIRTIME		
A	Provide mobile phone airtime for Clerk of works/Project Team Leader which shall be given to officers in advance every month by the Contractor for the Contract Duration (Ksh. 500,000.00) Kenya Shillings Five Hundred thousand only.	500,000.00
B	Include a percentage Sum for the Contractor's Cost and Profit for the above.....%	
TOTAL CARRIED TO COLLECTION		

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
	<p><u>BILL NO. 03</u></p> <p><u>COLLECTION</u></p> <p>Brought Forward From Page P.P/ 1</p> <p>Brought Forward From Page P.P/ 2</p> <p>Brought Forward From Page P.P/ 3</p> <p>Brought Forward From Page P.P/ 4</p> <p>Brought Forward From Page P.P/ 5</p> <p>Brought Forward From Page P.P/ 6</p> <p>Brought Forward From Page P.P/ 7</p> <p>Brought Forward From Page P.P/ 8</p> <p>Brought Forward From Page P.P/ 9</p> <p>Brought Forward From Page P.P/ 10</p> <p>Brought Forward From Page P.P/ 11</p>	
	<i>TOTAL FOR PARTICULAR PRELIMINARIES CARRIED TO GRAND SUMMARY</i>	

BILL NO. 04

GENERAL PRELIMINARIES.

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
	<p><u>BILL NO. 04</u></p> <p><u>GENERAL PRELIMINARIES</u></p>	
A	<p><u>PRICING OF ITEMS OF GENERAL PRELIMINARIES AND PREAMBLES</u></p> <p>Prices shall be inserted against items of preliminaries in the Contractor's priced Bills of Quantities and Specifications.</p> <p>The Contractor shall be deemed to have included in his prices or rates for various items in the Bills of Quantities of Specifications for all costs involved in complying with all the requirements for the proper execution of the whole of the works in the Contract.</p>	
B	<p>Throughout these bills, units of measurement and terms are abbreviated and shall be interpreted as follows</p> <p>C.M. Shall mean cubic metre</p> <p>S.M. Shall mean square metre</p> <p>L.M. Shall mean linear metre</p> <p>MM Shall mean Millimeter</p> <p>Kg. Shall mean Kilogramme</p> <p>No. Shall mean Number</p> <p>Prs. Shall mean Pairs</p> <p>B.S. Shall mean the British Standard Specification Published by the British Standards Institution, 2 Park Street, London W.I., England.</p> <p>Ditto Shall mean the whole of the preceding description except as qualified in the description in which it occurs, where it occurs in brackets it shall mean the whole of the proceeding description which is contained within the appropriate brackets.</p>	
	TOTAL CARRIED TO COLLECTION	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
	<p align="center">M.S. Shall mean measured separately.</p> <p align="center">a.b.d Shall mean as before described.</p> <p>A <u>EXCEPTION TO THE STANDARD METHOD OF MEASUREMENT</u></p> <p>Attendance; Clause B19(a) of the Standard Method of Measurement is deleted and the following Clause is substituted:-</p> <p>Attendance on nominated Sub-Contractors shall be given as an item in each case and shall be deemed to include: allowing use of standing scaffolding, mesh rooms, sanitary accommodation and welfare facilities; provision of special scaffolding where necessary, providing space for office accommodation, and for storage of plant and materials; providing light and water for the works; clearing away rubbish; unloading checking providing electric power and removing and replacing duct covers, pipe chasings and the like necessary for the execution and testing of Sub-Contractor's work and being responsible for the accuracy of the same.</p> <p>Fix Only; "Fix Only" Shall mean take and delivery at the nearest Rail Station (unless otherwise stated), pay all demurrage charges, load and transport to site where necessary, distribute to position, hoist and fix only.</p> <p>B THE EMPLOYER</p> <p>The "Employer" is the MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY</p> <p>The term "Employer" and MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY wherever used in the Contract Document shall be synonymous.</p> <p>C PROJECT MANAGER</p> <p>The term "PM" wherever used in this Bills of Quantities shall be deemed to imply the Project Manager as defined in Conditions of Contract or such person or persons as may be duly authorized to represent him on behalf of the</p>	
	TOTAL CARRIED TO COLLECTION	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
<p>A</p>	<p>PROJECT CONSULTANTS:</p> <p>CONSULTING ARCHITECT.</p> <p>The term "Consulting Architect" shall be deemed to mean " M/S OTTO MRUTTU + PARTNERS, ARCHITECTS OF P.O BOX 76382-00508, NAIROBI.</p> <p>Any instructions, directions, approvals, and correspondence as regards this contract from the Consulting Architects shall be deemed for all purposes in the works as instructions, directions, approvals and correspondence from the Project Manager and shall be carried out appropriately as the actions of the Project Manager.</p>	
<p>B</p>	<p>CONSULTING QUANTITY SURVEYOR.</p> <p>The term "Consulting Quantity Surveyor" shall be deemed to mean "M/S QUANTI - BILL CONSULTS CO. LTD OF P.O. BOX 34360 - 00100, NAIROBI.</p> <p>Any instructions, directions, approvals, valuations and correspondence from the Consulting Quantity Surveyors shall be deemed for all contractual purposes in the works to be instructions, directions approvals valuations from the Project Manager and shall be carried out appropriately as the actions of the Project Manager</p>	
<p>C</p>	<p>CONSULTING ELECTRICAL ENGINEER.</p> <p>The term "Consulting Electrical Engineer" shall be deemed to mean " M/S REX CONSULTANTS OF P.O. BOX 73878 - 00200, NAIROBI. Any instructions, directions, approvals, valuation and correspondence from the Consulting Electrical Engineer shall be deemed for all contractual purposes in the works to be instructions, directions, approvals, valuations from the Project Manager and shall be carried out appropriately as the actions of the Project Manager.</p>	
<p>B</p>	<p>CONSULTING MECHANICAL ENGINEER.</p> <p>The term "Consulting Mechanical Engineer" shall be deemed to mean" M/S REX CONSULTANTS OF P.O. BOX 73878 - 00200, NAIROBI. Any instructions, directions, approvals, valuations and correspondence from the Consulting Mechanical Engineer shall be deemed for all contractual purposes in the works to be instructions, directions, approvals, valuations from the Project Manager and shall be carried out appropriately as the actions of the Project Manager.</p>	
<p>TOTAL CARRIED TO COLLECTION</p>		

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
<p>A</p>	<p>FORM OF CONTRACT.</p> <p>The Form of Contract shall be as stipulated in the Republic of Kenya's Standard Tender Document for Procurement of Building and Associated Civil Engineering Works (issued by Public Procurement Oversight Authority (PPOA) in January 2007) or latest edition. The Conditions of Contract are also included herein. These are numbered Clauses No. 01 to 38 as set out in pages 18 to 40 of these tender document. Particular of insertions to be made in Appendix to the Contract Agreement will be found in the Particular Preliminaries part of these Bill of Quantities.</p>	
<p>B</p>	<p>PLANT, TOOLS AND VEHICLES</p> <p>Allow for providing all scaffolding, plants, tools and vehicles required for the works except in so far as may be stated otherwise herein and except for such items specifically and only required for use of nominated Sub-Contractors as described herein. No timber used for scaffolding, formwork or temporary works of any kind afterwards in the permanent works.</p>	
<p>C</p>	<p>TRANSPORT</p> <p>Allow for transport of workmen, materials, etc. to and from the site at such hours and by such routes as may be permitted by competent Authorities</p>	
<p>D</p>	<p>MATERIALS AND WORKMANSHIP</p> <p>All materials and workmanship used in the execution of the works shall be of the best quality and description unless otherwise stated. The Contractor shall order all materials to be obtained from overseas immediately after the contract is signed and shall also order for materials to be obtained from local sources as early as necessary to ensure that they are onsite when require for use in the works. The Bills of Quantities shall not be used for the purposes of ordering materials.</p>	
	<p align="center">TOTAL CARRIED TO SUMMARY</p>	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
<p>A</p>	<p>SIGN FOR MATERIALS The Contractor shall be required to sign receipts for all articles and materials supplied by the Project Manager at the time of taking delivery thereof, as having received them in good order and condition, and will thereafter be responsible for any such loss or damage and for replacement of such any loss with articles and/or materials which shall be supplied by the Project Manager at the current market prices including Customs Duty and VAT , all at the Contractors own cost and expenses, to the satisfaction of the PROJECT MANAGER.</p>	
<p>B</p>	<p>STORAGE OF MATERIALS The Contractor is advised the bank will not allow on - site storage of materials for lack of space and the Contractor shall procure storage space elsewhere as detailed in page PP/2 item C. This being a consortia contract, the Main Contractor to allow for the storage facilities for the subcontractors.</p>	
<p>C</p>	<p>SAMPLES The Contractor shall furnish at his own cost any samples of materials or workmanship including concrete test cubes required for the works that may be called for by the PROJECT MANAGER for his approval until such samples are approved by the PROJECT MANAGER may reject any materials or workmanship not in his opinion not to the approved sample. The PROJECT MANAGER shall arrange for testing of such materials as he/she may at his/her discretion deem desirable, but the testing shall be made at the expense of the Contractor and not at the expense of the PROJECT MANAGER. The Contractor shall pay for the testing in accordance with the current scale of testing charges laid down by Ministry of Public Works</p> <p>The procedure for submitting samples of materials for testing and the method of marking for identification shall be laid down by the PROJECT MANAGER. The Contractor shall allow in his tender for such samples and tests except for those in connection with nominated subcontractor's work.</p>	
	<p>TOTAL CARRIED TO SUMMARY</p>	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
<p>A</p>	<p>GOVERNMENT ACT REGARDING WORK PEOPLE ETC.</p> <p>Allow for complying with Government Acts, order and Regulations in connection with the employment of Labor and other matters related to the execution of the works. In particular, the Contractors attention is drawn to the provisions of the Factory Act of , 1950 and the tenderer must include for all costs arising or resulting from compliance with any Act, Order or Regulation relating to insurance, pensions, and holidays for workpeople or so the safety, and welfare of the work people.The Contractor must make himself fully acquainted with current Acts and Regulations, including police regulations regarding movements, housing, security and control of labor, labor camps, passes for transport, etc. It is important that the Contractor, before tendering obtains information regarding all such regulations and/or restrictions which may affect the organization of the works, supply and control of labor, etc, and allow accordingly in his tender. No claim shall be entertained for lack of knowledge in this respect.</p>	
<p>E</p>	<p>SECURITY OF WORKS, ETC.</p> <p>The Contractor shall be entirely responsible for the security of the works, materials, plant, personnel, etc, both his own and subcontractor's and must provide all necessary watching, lighting and precautions necessary to ensure security against theft, loss or damage and the protection of the public.</p>	
<p>B</p>	<p>PUBLIC AND PRIVATE ROADS</p> <p>Maintain as required throughout the execution of the works and make good any damage to Public or Private roads arising from or subsequent upon the execution of the works to the satisfaction of the local and other competent authority and the Project Manager.</p>	
<p>C</p>	<p>EXISTING PROPERTY</p> <p>The Contractor shall take every precaution to avoid damage to existing property including roads, cables, drains, and other services and he will be held responsible for and shall make good all such damages arising from the execution of this Contract at his own expense and at his own cost to the satisfaction of the Project Manager.</p>	
<p>D</p>	<p>VISIT THE SITE AND EXAMINE DRAWINGS</p> <p>The Contractor is advised to examine the drawings and visit the site location of which is described in the Particular Preliminaries hereof. He shall be deemed to have acquainted him/ herself therewith as to its nature position, means of access or any other matter which may affect his tender. No claim arising from his failure to comply with this advice shall be entertained.</p>	
	<p align="center">TOTAL CARRIED TO SUMMARY</p>	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
<p>A</p>	<p>ACCESS TO SITE. Means of accessing the site shall be agreed with the PROJECT MANAGER prior to commencement of the works and the Contractor must allow for building any necessary temporary access for the transport of materials, plant and workmen as may be required for the complete execution of the works including the provision of temporary gates or any other means of accessing the site. Upon completing the works, the Contractor shall remove any temporary gate and make good and reinstate all works and surfaces disturbed to the satisfaction of the PROJECT MANAGER.</p>	
<p>B</p>	<p>AREA TO BE OCCUPIED BY THE CONTRACTOR The area of the site which may be occupied by the Contractor for use of storage and for the purpose of erecting workshops etc; shall be defined on site by the PROJECT MANAGER.</p>	
<p>C</p>	<p>WATER AND ELECTRICITY SUPPLY The Contractor shall provide at his own risk all necessary water, electric light and power required for use in the works. The Contractor must make his own arrangement for connection to the nearest suitable water mains and for metering the water used. He must also provide temporary water tank and meters as required at his own cost and clear away when no longer required and make good on completion to the entire satisfaction of the PROJECT MANAGER. The Contractor shall pay all charges in connection herewith. No guarantee in given or implied that sufficient water will be available from mains and the Contractor must make his own arrangement for augmenting this supply at his own cost. Nominated Subcontractors are to be made liable for the cost of any water or electric current used and for any installation provided especially for their own use.</p>	
<p>D</p>	<p>SANITATION OF THE WORKS The sanitation of the works shall be arranged and maintained by the Contractor to the satisfaction of the Project Manager, Local Authorities and Labour Department.</p>	
	<p>TOTAL CARRIED TO COLLECTION</p>	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
A	<p>PERFORMANCE BOND.</p> <p>The Contractor shall find and submit in the Form of Tender an APPROVED BANK or APPROVED PPOA INSURANCE COMPANY and who will be willing to be bound to the Employer in amount equal to Ten per cent (10%) of the Contract amount for the due performances of the Contract up to the date of completion as certified by the PROJECT MANAGER and who will when and if called upon, sign a Bond to that effect on the relevant standard form included herein (without the addition of any limitations) on the same day as the Contract Agreement is signed, by the Employer, and the Contractor in the event that bank submitted does not sign the Performance Bond by the date the Contract Agreement is signed by the parties for whatsoever reasons, the Contractor shall furnish within seven days another Surety to the approval of the Employer</p>	
B	<p>COMMUNICATION FACILITIES</p> <p>The Contractor shall allow for telephone on site and to maintain the same for use by the Project Manager.</p>	
C	<p>NATIONAL INSURANCES AND PENSIONS</p> <p>The Contractor shall allow for making any National Social Security Fund Payments due in respect of work people.</p>	
D	<p>DIRECT CONTRACTS</p> <p>Notwithstanding the foregoing conditions, the Meru University reserves the right to place a "Direct Contract" for any goods or services required in the works which are covered by a P.C. Sum in the Bills of Quantities and to pay for the same direct. In any such instances, profit relative to the P.C. Sum, the priced Bills of Quantities will be adjusted as described for P.C. Sums and allowed.</p>	
E	<p>PROTECTION OF THE WORKS AND PERSONS.</p> <p>The Contractor shall allow for the protection of the whole of the works contained in the Bills of Quantities, including casing , casing up, temporary roofs, gutters, drains as may be necessary to avoid damage to finished works to the satisfaction of the PROJECT MANAGER and remove such protection when no longer required and make good any damage which may nevertheless have been done at completion free of cost to the Government.</p>	
	TOTAL CARRIED TO SUMMARY	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
	<p>From the beginning to the completion of the Works, the same shall be under the entire care and control of the Contractor, who shall take all possible precautions to ensure the safety of all wheeled traffic and pedestrians. The Contractor shall allow for providing all watching, lighting, barriers, covering open trenches, caution warnings and protection of the works including Sub-Contract Works, the protection of the public and his own and Sub-Contractors employees.</p> <p>In the event of any damage or loss occurring to the works or to materials or to any sewers, gullies, drains, paths or other existing works, on site in temporary possession of the Contractor for the purpose of the completion works of this contract, either from the weather, want or proper protection, defects, theft, insufficiency of the works or any other cause whatsoever during the progress of the works, or for any accident or damage to property or persons by reason of the works, the Contractor alone shall be responsible and shall without extra charge, make good all damage and pay all costs incurred.</p> <p>A PRICE FLUCTUATION CLAUSE</p> <p>This is a FIXED PRICE CONTRACT and no fluctuations will be entertained whatsoever in labour, materials or forex. The Contractor to price this tender as a fixed price contract as no fluctuations whatsoever will be permitted and no claim whatsoever will be entertained for failure to so price.</p> <p>B LIABILITY OF DEFECTS</p> <p>Defects, shrinkages, or other faults which are attributed by the PROJECT MANAGER to work executed under this contract shall be made good by the Contractor at their own cost.</p> <p>C GENERAL SPECIFICATION.</p> <p>For the full description of materials and workmanship, method of execution of the work and notes for pricing, the Contractor is referred to the Ministry of Roads and Public Works General Specification dated 1976 or any subsequent revision thereof which is issued as a separate document, and which shall be allowed in all respects. Unless it conflicts with the General Preliminaries, Trade Preambles or other items in these Bills of Quantities it shall apply.</p> <p>In the event of such conflict, the provision of the General and Particular Preliminaries, Trade Preambles and these Bills of Quantities shall take Precedence.</p>	
	TOTAL CARRIED TO COLLECTION	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
A	<p>INCOMPETENCE</p> <p>The PROJECT MANAGER and his Representatives reserve the right to dismiss any incompetent or negligent workmen from the job and such persons shall not be employed on the work again.</p>	
B	<p>TRIAL PITS IN FOUNDATIONS TO STRUCTURES.</p> <p>The Contractor shall allow before commencing excavation for any foundation works on site for opening up trial pits within the areas of the foundation as directed by the PROJECT MANAGER. Where a trial pit is excavated to a level below the founding level of the structure, it shall be backfilled to that level with approved material or concrete as directed by the PROJECT MANAGER. No claim will be entertained for failure to allow for opening up of trial pits</p>	
C	<p>DEDUCTIONS FROM MONEY DUE TO THE CONTRACTOR.</p> <p>The PROJECT MANAGER shall be entitled to deduct any monies which the Contractor shall be liable to pay under the Contract to the Employer from any sum which may become payable to the Contractor hereunder the PROJECT MANAGER in issuing his Certificates as provided in the Payment clause shall have regard to any sums so chargeable against 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.</p>	
D	<p>TRADE NAMES</p> <p>Where trade names or manufacturer's catalogue numbers are mentioned in these Bills of Quantities the reference is intended as a guide to the type or article or quality of material required. The Contractor may use any article or material equal in type or quality to those herein described subject to the prior approval of the PROJECT MANAGER and at his absolute discretion. The onus of proof as to equivalent quality will rest with the Contractor whose Tender will be deemed to include for the makes described.</p>	
	<p>TOTAL CARRIED TO COLLECTION</p>	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
A	<p>SIGNBOARD</p> <p>The Contractor shall allow for providing, erecting and maintaining 1No. standard signboard at site or where shown, the sizes, type of construction and lettering of which shall be to the PROJECT MANAGER'S design. The names of the Client, Client's Representatives, Consultants and NCC Approval Number are to be fixed in lettering 50mm high. The board is to be fixed in an elevated position on the site or where indicated by the PROJECT MANAGER. On completion of the works, the notice board shall be removed and making good shall be carried out as necessary.</p>	
B	<p>SCAFFOLDING</p> <p>The Contractor shall allow for providing, erecting and dismantling and removal at completion of all general scaffolding required for the works. The Contractor must allow here on in his rates for providing all special scaffolding required by Domestic Sub-contractors and Nominated Sub-contractors carrying out works for which P.C. sums are included later in these bills.</p>	
C	<p>PUBLIC HOLIDAYS</p> <p>The Contractor shall allow in his programme for the following eleven (11) Public Holidays per calendar year in Kenya, during which the Contractor shall not be permitted to work.</p> <p>New Year's Day (1st January)</p> <p>Good Friday</p> <p>Easter Monday</p> <p>Labour Day (1st May)</p> <p>Madaraka Day (1st June)</p> <p>Idd-UI-Fitr</p> <p>Heroes Day (20th October)</p> <p>Jamhuri Day (12th December)</p> <p>Christmas Day (25th December)</p> <p>Boxing Day (26th December)</p>	
	TOTAL CARRIED TO COLLECTION	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
	<p>The Contractor should also allow per calendar year for a further two (2) unspecified public holidays which may be announced by the Government of Kenya without prior notification, and during which the Contractor shall not be permitted to work. No claim shall be entertained either monetary or extension of time for failure to allow for Public Holidays.</p> <p>A VALUATION OF LUMP SUM PRELIMINARY COSTS</p> <p>Lump sums entered in these Bills of Quantities against any items 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 installments over the balance of the Contract Period. Preliminary items must be in accordance with actual costs and loading may cause disqualification.</p> <p>B WORK TO BE OPENED UP AT THE REQUEST OF THE PROJECT MANAGER.</p> <p>The Contractor shall at the request of the PROJECT MANAGER and or Project Manager's Representative within such time as the Project Manager shall name, open for inspection any work covered up, and should the Contractor refuse or neglect to comply with such request, the Project Manager may employ workmen other than those employed by the Contractor to open up the same.</p> <p>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 expenses of opening and covering it up against whether done by the Contractor or by the PROJECT MANAGER, shall be borne by and be recoverable from the Contractor or may be deducted from any monies due to the Contractor.</p> <p>If the work has not been covered up in contravention of such instructions and be found in accordance with the said Drawings and Bills of Quantities, then the expenses aforesaid shall be borne by the Employer and be added to the Contract sum; provided always that in the case of foundations or of any other urgent work so opened up and requiring immediate attention, the PROJECT MANAGER shall, within a reasonable time after the work has been opened, make or cause to be made the inspection thereof, and at the expiration of such time, if such inspection shall not have been made the Contractor may cover up again for inspection except at the expense of the Employer.</p> <p>TOTAL CARRIED TO COLLECTION</p>	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
A	<p>PROGRESS CHART. The Contractor shall provide within two weeks of Possession of Site and in Agreement with the PROJECT MANAGER a Progress Chart for the whole of the works including the works of Nominated Subcontractors; one copy to be handed to the PROJECT MANAGER and a further copy to be retained on site. Progress to be recorded and chart to be amended as necessary as the work proceeds.</p>	
B	<p>PRIME COST OR P.C. SUMS. The term "Prime Cost or P.C. Sum" whenever used in these Bills of Quantities shall be expended upon the authority of the Project Manager.</p>	
C	<p>ADJUSTMENT OF P.C. SUMS. In the final account, all P.C. Sums shall be deducted and the amount properly expended upon the PROJECT MANAGER'S order in respect of each of them added to the Contract Sum .The Contractor shall produce to the PROJECT MANAGER such quotations, invoices or bills, properly receipted, as may be necessary to show the actual details of the sums paid by the Contractor. Items of profit upon P.C. Sums shall be adjusted in the final account pro-rata to the amount paid. Items of attendance (as previously described) following P.C. Sums shall be adjusted to the physical extent of the work executed (not pro-rata to the amount paid) and shall apply even though the Contractors Priced Bills of Quantities shows a percentage in the rate column in respect of them.</p> <p>Should the Contractor be permitted to tender and his tender be accepted of any work for which a P.C. Sum is included in the Bills of Quantities profit and attendance will be allowed as it would be if the work were executed by a Nominated Subcontractor.</p>	
D	<p>ADJUSTMENT OF PROVISIONAL SUMS In the final account all Provisional Sums shall be deducted and the amount properly executed in respect of them upon the PROJECT MANAGER's order added to the Contract Sum. Such works shall be valued as described for Variations in Clause No.22 of the Conditions of Contract, but the value of such work or articles for the work to be supplied by a Nominated Subcontractor, the value of such work or article to be supplied by a Nominated Supplier, the value of such work or article shall be treated as a P.C Sum and profit and attendance comparable to that contained in the priced Bills of Quantities for similar items added.</p>	
	TOTAL CARRIED TO COLLECTION	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
<p>A</p>	<p>NOMINATED SUB-CONTRACTORS. When any work is ordered by the Project Manager to be executed by Nominated Subcontractors, the Contractor shall enter into Sub - contracts as described in Clause NO. 08 of the Conditions of Contract and shall thereafter be responsible for such Sub - contractors in every respect. unless otherwise described the Contractors is to provide for such Sub - contractors any or all of the facilities described in these, Preliminaries. The Contractor should price for these within the Nominated Sub - Contractors work concerned in the P.C. Sums under the description "Add for Attendance" to include both Attendance and any Special Attendance that may be necessary.</p>	
<p>B</p>	<p>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 covered by a P.C. Sum in the Bills of Quantities and to pay for the same direct. In any such instances, profit relative to the P.C. Sum the priced Bills of Quantities will be adjusted as described for P.C. Sums and allowed.</p>	
	<p>TOTAL CARRIED TO COLLECTION</p>	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
<p>A</p>	<p>PAYMENTS TO DOMESTIC SUBCONTRACTORS.</p> <p>The Contractor shall be fully responsible for paying his Domestic Sub - Contractors but the Employer reserves the right in very exceptional circumstances to make such payments direct in the interest of the project where completion thereof might be jeopardized by any dispute between the Contractor and any of his domestic sub - contractors.</p>	
<p>B</p>	<p>ATTENDANCE UPON OTHER TRADESMEN, ETC.</p> <p>The Contractor shall allow for the attendance of trade upon trade and shall afford any tradesmen or any other persons employed for the execution of any work not included in this Contract every facility for carrying out the work and also for use in his ordinary scaffolding. The Contractor, however, shall perform such carting away for and making good after the work of such tradesmen or persons as may be ordered by the PROJECT MANAGER and the work will be measured and paid for to the extent executed at rates provided in these bills.</p>	
<p>C</p>	<p>INSURANCE</p> <p>The Contractor shall insure as required in accordance with Clause NO. 30.3 of the Conditions of Contract. No payment on account in respect of the works shall be made to the Contractor unless he/she has satisfied the PROJECT MANAGER either by production of an Insurance Policy certificate that the foregoing Insurance Clauses have been complied within all respects. Thereafter the PROJECT MANAGER shall from time to time ascertain that premiums are duly paid up by the Contractor who shall if called upon to do so, produce receipted premium renewals for the PROJECT MANAGER's inspection. The contractor shall allow for 9% of value of work over and above the value of work to cover professional fees for insurance purposes only. All Insurance Policies must have the interest of Meru University endorsed in them.</p>	
<p>D</p>	<p>PROVISIONAL WORK</p> <p>All work described as "Provisional" in these Bills of Quantities is subject to re-measurement in order to ascertain the actual quantity executed for which payment will be made. All "Provisional" and other work liable to adjustment under this Contract be left uncovered for a reasonable period of time to enable all measurements needed to be taken by the PROJECT MANAGER. Immediately the work is ready for measuring, the Contractor shall give notice to the PROJECT MANAGER. If the Contractor makes default in these respects he/she shall if the PROJECT MANAGER so directs uncover the work to enable all measurements to be taken afterwards reinstate at his own expense.</p>	
	<p align="center">TOTAL CARRIED TO COLLECTION</p>	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
<p>A</p>	<p>ALTERATION TO BILLS, PRICING, ETC.</p> <p>Any unauthorized alteration or qualification made to the text of the Bills of Quantities may cause to Tender to be disqualified and in any case be ignored. The Contractor shall be deemed to have made allowance in his/her prices generally to cover any items against which no price has been inserted in the Priced Bills of Quantities. All items of measured work shall be priced in detail and the Tenders containing Lump Sums to cover trades or groups of work must be broken down to show the prices of each item before they will be accepted.</p>	
<p>B</p>	<p>BLASTING OPERATIONS</p> <p>Blasting shall Not be permitted.</p>	
	<p>MATERIALS ARISING FROM EXCAVATIONS</p>	
<p>C</p>	<p>Materials of any kind obtained from excavations shall be the property of the National Bank of Kenya. Unless the PROJECT MANAGER directs otherwise such materials shall be dealt with as provided in the Contract. Such materials shall only be used in the works, in substitution for materials which the Contractor will otherwise have had to supply with the written permission of the PROJECT MANAGER. Should such permission be given, the Contractor shall make due allowance for materials so used at a price to be agreed.</p>	
	<p align="center">TOTAL CARRIED TO COLLECTION</p>	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
<p>A</p>	<p>PROTECTION OF THE WORKS</p> <p>Provide protection of the whole of the works contained in the Bills of Quantities, including casing, casing up, covering or such other means as may be necessary to avoid damage to the satisfaction of the PROJECT MANAGER and remove such protection when no longer required and make good any damage which nevertheless have been done at completion free of cost to the to Government.</p>	
<p>B</p>	<p>WORKS TO BE DELIVERED UP CLEAN</p> <p>Clean and flush all gutters, rainwater and waste pipes, manholes and drains, wash (except where such treatment might cause damage) and clean all floors, sanitary fittings, glass inside and outside and any other parts of the works and remove all marks, blemishes, stains and defects from joinery, fittings and decorated surfaces generally, polish door furniture and bright parts of metal work and leave the whole of the buildings water tight, clean, perfect and fit for occupation to the approval of the PROJECT MANAGER.</p>	
<p>C</p>	<p>TRAINING LEVY</p> <p>The Contractor's attention is drawn to legal notice No. 237 of October, 1971 which requires payment by Contractor of a Training levy at the rate of 1/4% of the Contract Sum on all Contracts of more than Kshs. 500,000.00 in value.</p>	
<p>D</p>	<p>MATERIALS ON SITE</p> <p>All materials for incorporation into the works must be stored on or adjacent to the site before payment is effected unless specifically exempted by the PROJECT MANAGER. This includes the materials of the Main Contractor, Nominated Subcontractors and Nominated Suppliers.</p>	
<p>E</p>	<p>HOARDING</p> <p>The Contractor shall enclose the site or part of the works under construction particularly the site facing education blocks with a hoarding 2400mm high consisting of iron sheets on 100x50mm timber posts firmly secured at 1800mm centers with two 75x50mm timber rails. The Contractor is in addition required to take precautions necessary for the safe custody of the works, materials, plant, public and Employer's property on the site. The tenderer is advised to make site verification and no claim will be entertained for the failure to carry out site verification.</p>	
<p>F</p>	<p>NETTING ENVELOPE OF THE BUILDING.</p> <p>While working on the building envelope the Contractor shall provide for protective netting. No claim will be admitted upon failure to allow for hoarding and envelope netting as described.</p>	
	<p>TOTAL CARRIED TO COLLECTION</p>	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
A	<p>CONTRACTOR'S SUPERINTENDENCE/ SITE AGENT</p> <p>The Contractor shall constantly keep on the works a literate English and Kiswahili speaking Agent Representative, competent and experienced in the kind of work involved who shall give his whole experience in the kind of work involved and shall give his whole time to the superintendence of the works. Such Agent or Representative shall receive on behalf of the Contractor all directions and instructions from the PROJECT MANAGER and such directions shall be deemed to have been given to the Contractor in accordance with the Conditions of Contract.</p>	
B	<p>QUARRIES AND BORROW PITS, STOCKPILE AND SPOIL AREAS</p> <p>The Contractor shall be responsible for the leasing or renting of, and compensation for all land required for quarries, borrow pits, dump site, spoil and stockpile areas and access thereto. No claims whatsoever shall be entertained for failure to allow pricing on this item at all.</p>	
C	<p>KENYA BUREAU OF STANDARD COMPLIANCE</p> <p>The Contractor shall be KEBS compliance by meeting the relevant Kenya Bureau of Standards statutory levies in accordance with the law.</p>	
D	<p>LOCAL AUTHORITIES STATUROTY REQUIREMENTS.</p> <p>The tenderer shall included in their rates any Local Authority Charges e.g. Licenses, Cess, Parking Fee Hoarding Licenses, Vehicular toll charges, dumping licences and sites etc, as these will not be paid for separately.</p>	
E	<p>SAFETY AND HEALTH REGULATIONS.</p> <p>The Contractor shall provide for health and safety officer and comply with safety and health regulations in accordance with Industrial and Other Places of Work safety and Health Regulation Act.</p> <p>The Contractor shall allow for installing clearly visible "warning sign" and "Warning Tapes" as part of security and safety management.</p> <p>The Contractor shall allows for safety gear for workers in accordance with this Clause e.g. identification badge, helmet, grooves, overalls/dust coats etc.</p>	
	TOTAL CARRIED TO COLLECTION	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
<p>A</p>	<p>PRE - TENDER SITE VISIT AND STATUS INSPECTION.</p> <p>The Contractor is advised to visit the site before tender to appraise themselves of accessibility, restrictions, security controls, status conditions, environment of work delivery and any difficult variables. No claims will be accepted for failure to have acquainted themselves with the site and the environment in general.</p>	
<p>B</p>	<p>Meru University reserves the right to accept or reject any (or all) bids without any obligations to give reasons for so doing.</p>	
	<p align="center">TOTAL CARRIED TO COLLECTION</p>	

**PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 -
(NCHIRU) MERU-MAUA ROAD, MERU COUNTY.**

ITEM	DESCRIPTION	KSHS
	<p><u>BILL NO. 04</u></p> <p><u>COLLECTION</u></p> <p>Brought Forward From Page GP/ 01</p> <p>Brought Forward From Page GP/ 02</p> <p>Brought Forward From Page GP/ 03</p> <p>Brought Forward From Page GP/ 04</p> <p>Brought Forward From Page GP/ 05</p> <p>Brought Forward From Page GP/ 06</p> <p>Brought Forward From Page GP/ 07</p> <p>Brought Forward From Page GP/ 08</p> <p>Brought Forward From Page GP/ 09</p> <p>Brought Forward From Page GP/ 10</p> <p>Brought Forward From Page GP/ 11</p> <p>Brought Forward From Page GP/ 12</p> <p>Brought Forward From Page GP/ 13</p> <p>Brought Forward From Page GP/ 14</p> <p>Brought Forward From Page GP/ 15</p> <p>Brought Forward From Page GP/ 16</p> <p>Brought Forward From Page GP/ 17</p> <p>Brought Forward From Page GP/ 18</p> <p>Brought Forward From Page GP/ 19</p>	
	<p align="center">TOTAL FOR GENERAL PRELIMINARIES CARRIED TO MAIN SUMMARY BUILDERS WORK</p>	

BILL NO. 05

**SOCCER PITCH WITH RUNNIG
TRACK.**

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>BILL NO. 05 : SOCCER PITCH WITH RUNNING TRACK</u>				
	<u>ELEMENT NO. 1 - EXCAVATIONS (All provisional)</u>				
	<u>Oversite Excavation</u>				
A	Excavate oversite average 100mm deep starting from existing ground level to remove vegetable soil and cart away	SM	16,800		
B	Excavate to remove cotton soils and/or to reduce levels to formation, stock pile the excavated soil strategically on site for re-use as directed..	CM	3,360		
C	Load and cart away excess excavated materials as directed on site.	CM	3,360		
	TOTAL FOR EXCAVATIONS CARRIED TO SUMMARY				

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD,
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 2 - SOCCER PITCH (All provisional)</u>				
	<u>Sub-Grade</u>				
A	Roll and compact subgrade formation to achieve 98% modified proctors MDD including grading to falls and crossfalls	SM	10,400		
B	Imported and approved murram backfill materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layers not exceeding 150mm Thick to Engineer's approval	CM	1,560		
C	Supply and lay graded Murram average 200mm Thick laid at a slope of 1:5%, well watered and compacted to 98% MDD at optimum moisture content in 2 layers each of 100mm thick to Engineer's approval.	SM	10,400		
	<u>Fillings</u>				
D	Pick from excavations and use selected excavated vegetable soil and lap to 150mm thick to be ploughed, disked, graded and chain harrowed for a smooth surface with even falls and a fine tilth for seeding including removal of weeds. Ameliorants (cow manure mixed at 1:2 of top soil) and fertilizer (11:6:9 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) to be mixed into the top soil to receive natural lawn (Pennisetum clandestinum) (m.s)	SM	10,400		
	<u>FINISHINGS</u>				
	<u>Natural finish</u>				
E	Natural lawn Arabica Grass (or equivalent) on 150mm deep amended top soil media (m.s) on 100mm well compacted fine sand (m.s) to receive fertilizer 4:1:3 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) 9-12 months after lawn seeding, and annually thereafter to specialist specifications . Contractor to allow for watering and maintenance for six months till fully established.	SM	10,400		
	TOTAL FOR SOCCER PITCH CARRIED TO COLLECTION				

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD,
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 3 - ATHLETICS TRACK (All provisional)</u>				
	<u>Sub-Grade</u>				
A	Roll and compact subgrade formation to achieve 98% modified proctors MDD including grading to falls and crossfalls	SM	4,300		
	<u>Fillings</u>				
B	Imported and approved murram backfill materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layers not exceeding 150mm Thick to Engineer's approval	CM	860		
	<u>Murram Surface Finish.</u>				
C	Supply and lay graded Murram average 300mm Thick laid at a slope of 1:0%, well watered and compacted to 98% MDD at optimum moisture content in 3 layers each of 100mm Thick to Engineer's approval.	SM	4,300		
	<u>Channels</u>				
D	Provide, lay and joint Channel, 125x150mm flush channel block, laid on and including 450x100mm concrete (1:3:6) bed and 100x200mm haunching behind including any necessary formwork and disposal of surplus material as directed.	LM	872		
	TOTAL FOR ATHLETICS TRACK CARRIED TO COLLECTION.				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 3 - LAWN SURROUND (All provisional)</u>				
	<u>Sub-Grade</u>				
A	Roll and compact subgrade formation to achieve 98% modified proctors MDD including grading to falls and crossfalls	SM	1,775		
B	Imported and approved murram backfill materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in layers not exceeding 150mm Thick to Engineer's approval	CM	444		
C	Supply and lay graded Murram average 200mm Thick laid at a slope of 1:0%, well watered and compacted to 98% MDD at optimum moisture content in 2 layers each of 100mm Thick to Engineer's approval.	SM	1,775		
	<u>150mm thick ammended top planting soil</u>				
D	Pick from excavations and use selected excavated vegetable soil and lap to 150mm thick to be ploughed, disked, graded and chain harrowed for a smooth surface with even falls and a fine tilth for seeding including removal of weeds. Ameliorants (cow manure mixed at 1:2 of top soil) and fertilizer (11:6:9 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) to be mixed into the top soil to receive natural lawn (Pennisetum clandestinum) (m.s)	SM	1,775		
	<u>FINISHINGS</u>				
	<u>Natural finish</u>				
E	Natural Paspalum Grass (or equivalent) on 150mm deep ammended top soil media (m.s) on 100mm well compacted fine sand (m.s) to receive fertilizer 4:1:3 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) 9-12 months after lawn seeding, and annually thereafter to specialist specifications .Contractor to allow for watering and maintenance for six months till fully established.	SM	1,775		
	TOTAL FOR LAWN SURROUND CARRIED TO COLLECTION				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 4 - WATER DRAINAGE AROUND THE PITCH</u>				
	<u>FRENCH DRAIN</u>				
	<u>Oversite Excavation</u> <u>(All excavations Measured Net)</u>				
	Excavate for French Drain average depth not exceeding 1500mm Deep, uphold the sides of excavation, keep excavations free from water, trim and compact the bottom of excavation to level and cart away the resultant excavated materials as directed on site as described in:				
A	Main-drain	CM	720		
B	Ditto to Sub-drain	CM	245		
	<u>Mass concrete (class 15/20) in:</u>				
	50mm Thick Class 15/20 mass concrete blinding to bottom of trenches to receive drain pipe as described in:				
C	Main-drain	SM	480		
	<u>Underground Drain Pipe.</u>				
	Supply, lay including necessary jointing and connections approved HDPE Perforated Pipe all to approval as described in:				
D	200mm Diameter main drain.	LM	800		
	<u>Supply, lay including necessary jointing and connections approved HDPE Pipe with and including 150mm thick concrete reinforced with fabric mesh as encasing all round all to approval as described in:</u>				
E	200mm diameter	LM	50		
	<u>Hesian Filter Fabric</u>				
F	Supply and lay approved hesian Filter Fabric to french drains girth 600mm wide.	LM	800		
G	Ditto girth 300mm wide.	LM	408		
	Carried to collection				

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD,
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Drain Fillings.</u>				
A	Approved imported hardcore fillings over perforated underground pipe in main drain.	CM	192		
B	Ditto above formation level on subdrains.	CM	37		
C	Supply and place approved 200mm graded aggregates ballast fillings over perforated underground pipe in main	CM	192		
D	Ditto above formation level on subdrains.	CM	24		
E	Supply and place approved sand fillings over perforated underground pipe in main drain.	CM	96		
F	Ditto above formation level on subdrains.	CM	24		
	<u>Inspection chambers</u>				
G	Construct 600 wide x 600 mm long x 1500 mm deep (internal dimensions) storm water manhole, comprising 150 mm thick concrete class 20 bed, 200 mm thick natural stonewalling in cement and sand (1:3) mortar, 150 mm thick concrete class 20 cover slab with requisite reinforcement, 450x 600 mm heavy duty cast iron cover and frame bedded in cement and sand (1:3) mortar; internally plastered & screeded in 15 mm thick lime plaster; 100 mm thick concrete class 20 benching; complete with necessary excavation, formwork and 2 No. connections to pipes not exceeding 200 mm diameter (pipe m/s)	No	29		
	Carried to collection				
	<u>Collection:</u>				
	Brought forward from page no 6				
	Brought forward from above				
	TOTAL FOR WATER DRAINAGE AROUND THE PITCH CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 6 - TERRACES (All provisional)</u>				
	<u>Excavations.</u> (All measurements are net and allow for extra excavations for working space as it will be necessitated by the site conditions).				
	<u>Oversite Excavations.</u>				
	Excavate oversite average 100mm deep starting from existing ground level to remove vegetable soil and cart away.	SM	2,162		
	<u>Excavation for foundations.</u>				
A	Excavate for strip foundation starting from reduced level and not exceeding 1.50m deep	CM	1,128		
B	Ditto exceeding 1.5m deep but not exceeding 3.0m deep.	CM	1		
C	Extra over for excavation in soft rock.	CM	1		
	<u>Disposal of excavated materials</u>				
D	Return fill and ram selected excavated materials around foundations.	CM	843		
E	Remove excavated materials from site as directed.	CM	287		
	<u>Planking and Water exclusion</u>				
F	Allow for planking and strutting to uphold sides of excavations	Item	1		
G	Ditto but keeping all excavations free from running or underground water by pumping or pailing	Item	1		
	<u>Concrete works</u>				
	<u>Mass concrete (class 15/20) in;</u>				
H	50mm thick blinding under strip footing	SM	1,128		
	<u>In-situ vibrated reinforced concrete (class 25/25mm) in;</u>				
I	Strip footing	CM	226		
J	Columns	CM	59		
K	Steps	CM	20		
L	Cast insitu coping	Cm	75		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ALL PROVISIONAL</u>				
	<u>Supply and fix steel reinforcement including cutting, bending, hooking, tying and supporting as required</u>				
	<u>High yield tensile square twisted bars to B.S 4461 and K.S 02.22:1976</u>				
A	Assorted Reinforcement bars of various sizes	KG	32,382		
	<u>Sawn formwork to:</u>				
B	Sides of strip foundation.	SM	752		
C	Sides of columns.	SM	1,178		
C	Sides and soffits of Coping beams	SM	1,128		
	<u>Foundation Walling.</u>				
	Approved Load bearing natural stone walling bedded and jointed in cement sand (1:4) mortar including 25mm x 20 gauge hoop iron reinforcement at every alternate course				
D	200mm thick walling	SM	1,880		
	<u>TERRACE WALLING</u>				
	<u>Selected fine dressed natural stone walling with a minimum of 7.0N/mm² average compressive strength to B.S. 5390; bedded and jointed in cement and sand mortar (1:4) to approval</u>				
E	200mm thick; reinforced every alternate course with 25mm x 3mm hoop iron wall ties	SM	1,904		
	<u>Keying Finish to exposed wall surfaces.</u>				
F	Horizontal raking/ keying and flush vertical joints all to approval.	SM	846		
	<u>Weep Holes.</u>				
G	Supply and fix 150mm UPVC pipe 250mm long as weep holes across 200mm thick wall with and including all necessary chasing and finish all around them.	NO	1,253		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Fillings</u>				
A	Imported and approved murram backfill materials as infill to terraces walls, well watered, rolled and compacted to 98% MDD at optimum moisture content in layers not exceeding 150mm Thick to Engineer's approval	CM	987		
B	Ditto but Pick and use selected excavated materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layer of 150mm Thick to Engineer's approval	CM	987		
	<u>300mm thick ammended planting top soil.</u>				
C	Pick from excavations and use selected excavated vegetable soil and lap to 150mm thick to be ploughed, disked, graded and chain harrowed for a smooth surface with even falls and a fine tilth for seeding including removal of weeds. Ameliorants (cow manure mixed at 1:2 of top soil) and fertilizer (11:6:9 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) to be mixed into the top soil to receive natural lawn (Pennisetum clandestinum) (m.s)	SM	1,974		
	<u>FINISHINGS</u>				
	<u>Natural Grass finish</u>				
D	Natural Paspalum Grass (or equivalent) on 150mm deep amended top soil media (m.s) on 100mm well compacted fine sand (m.s) to receive fertilizer 4:1:3 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) 9-12 months after lawn seeding, and annualy thereafter to specialist specifications .Contractor to allow for watering and maintenance for six months till fully established.	SM	1,974		
	<u>Channels</u>				
E	Provide, lay and joint Channel, 125x150mm flush channel block, laid on and including 450x100mm concrete (1:3:6) bed and 100x200mm haunching behind ancluding any necessary formwork and disposal of surplus material as directed.	LM	470		
	<u>Approved plant hedging behind top terrace.</u>				
F	Supply and plant (duranta) approved size plantings to act as hedging behind top terrace with and including watering and maintenance for six months until fully established.	No	1,567		
	Carried to collection				

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD,
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Collection:</u>				
	Brought forward from page SP-A/7				
	Brought forward from page SP-A/8				
	Brought forward from page SP-A/9				
	TOTAL FOR TERRACES CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT 7: GOAL POSTS</u>				
	<u>Excavation</u>				
A	Excavation for Goal post sockets diameter 150mm wide average depth not exceeding 1500 mm from formed level.	CM	2		
	<u>Load cart away</u>				
B	Load cart away surplus excavated materials to spoil heaps as directed on site.	CM	2		
	<u>In-situ vibrated reinforced concrete (class 25/25mm) in:</u>				
C	Socket - bases & stud columns	CM	1		
	<u>Reinforcement to V.R.C. - High yeild square twisted bars to B.S. 4461 and K.S 02.22:1976: including bends, hooks and tying wire</u>				
D	Assorted reinforcement bars of various sizes	KG	200		
	<u>Formwork</u>				
E	Sawn formwork with one coat of an approved retarding agent to vertical sides of socket bases	SM	8		
	<u>Mild steel work in:-</u>				
F	Achoring system anchoring in concrete including neoprene caps all as per manufacturer's instructions.	NO	4		
G	150mm Diameter x 4mm thick heavily padded CHS sockets all removable.	LM	11		
	<u>Aluminium goal upright</u>				
H	120mm diameter x 4mm thick aluminium goal post.	LM	40		
	<u>Prime stop and apply one undercoat and two finishing coats of gloss paint to CROWN PAINTS first quality or other equal and approved to metal surfaces of:</u>				
I	General metal surfaces	LM	11		
	<u>Footbal goal net</u>				
J	Standard twisted polyethylene footbal goal net overall size 30 meters square fixed to metal goal posts (m.s) with necessary ropes to approval	NO	2		
	TOTAL FOR GOAL POSTS CARRIED TO SUMMARY				

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD,
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
A	<p><u>ELEMENT NO. 9 - PRIME COSTS AND PROVISIONAL SUMS</u></p> <p><u>PROVISIONAL COST SUMS</u></p> <p>Provide a sum of KENYA SHILLINGS FOR FOURTY THOUSAND (40,000.00) only for refuse bins</p>				40,000.0
	<p>TOTAL ELEMENT NO. 09 : PRIME COSTS AND PROVISIONAL SUMS CARRIED TO SUMMARY</p>				

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD,
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>SUMMARY FOR BILL NO. 05 - SOCCER PITCH A (FIELD WITH RUNNING TRACK)</u>				
	<u>ELEMENT</u>				
1	EXCAVATIONS				
2	SOCCER PITCH				
3	ATHLETICS TRACK				
4	LAWN SURROUND				
5	WATER DRAINAGE AROUND THE PITCH				
6	TERRACES				
7	GOAL POSTS				
8	PRIME COSTS AND PROVISIONAL SUMS.				
	TOTAL ESTIMATE FOR BILL NO. 5 - SOCCER PITCH A (FIELD WITH RUNNING TRACK) CARRIED TO GRAND SUMMARY				

BILL NO. 06

HOCKEY PITCH A.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>BILL NO. 07 : HOCKEY PITCH A</u>				
	<u>ELEMENT NO. 1 - EXCAVATIONS (All provisional)</u>				
	<u>Oversite Excavation</u>				
A	Excavate oversite average 100mm deep starting from existing ground level to remove vegetable soil and cart away.	SM	9,417		
B	Excavate to remove cotton soils and/or to reduce levels to formation, stock pile the excavated soil strategically on site for re-use as directed..	CM	9,288		
C	Extra over ditto in soft rock	CM	1,393		
	<u>Filling to make up levels</u>				
D	Use selected excavated materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layer of 200mm Thick to Engineer's approval	CM	6,755		
E	Load and cart away excess excavated materials as directed on site.	CM	2,533		
	TOTAL FOR EXCAVATIONS CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
ELEMENT NO. 2 - HOCKEY PITCH (All provisional)					
<u>Sub-Grade</u>					
A	Roll and compact subgrade formation to achieve 98% modified proctors MDD including grading to falls and crossfalls	SM	6,695		
B	Imported and approved murrum backfill materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in layers not exceeding 150mm Thick to Engineer's approval	CM	1,339		
<u>Fillings</u>					
C	Pick from excavations and use selected excavated vegetable soil and lap to 150mm thick to be ploughed, disked, graded and chain harrowed for a smooth surface with even falls and a fine tilth for seeding including removal of weeds. Ameliorants (cow manure mixed at 1:2 of top soil) and fertilizer (11:6:9 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) to be mixed into the top soil to receive natural lawn (Pennisetum clandestinum) (m.s)	SM	6,695		
<u>FINISHINGS</u>					
<u>Natural finish</u>					
D	Natural lawn Arabica Grass (or equivalent) on 150mm deep amended top soil media (m.s) on 100mm well compacted fine sand (m.s) to receive fertilizer 4:1:3 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) 9-12 months after lawn seeding, and annually thereafter to specialist specifications . Contractor to allow for watering and maintenance for six months till fully established. Contractor to allow for watering and maintenance for six months till fully established.	SM	6,695		
<u>Channels</u>					
E	Provide, lay and joint Channel, 125x150mm flush channel block, laid on and including 450x100mm concrete (1:3:6) bed and 100x200mm haunching behind including any necessary formwork and disposal of surplus material as directed.	LM	360		
TOTAL FOR HOCKEY PITCH B CARRIED TO SUMMARY					

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 3 - WATER DRAINAGE AROUND THE PITCH</u>				
	<u>FRENCH DRAIN</u>				
	<u>Oversite Excavation</u> <u>(All excavations Measured Net)</u>				
	Excavate for French Drain average depth not exceeding 1500mm Deep, uphold the sides of excavation, keep excavations free from water, trim and compact the bottom of excavation to level and cart away the resultant excavated materials as directed on site as described in:				
A	Main-drain	CM	333		
B	Ditto to Sub-drain	CM	204		
	<u>Mass concrete (class 15/20) in;</u>				
	50mm Thick Class 15/20 mass concrete blinding to bottom of trenches to receive drain pipe as described in:				
C	Main-drain	SM	222		
	<u>Underground Drain Pipe.</u>				
	Supply, lay including necessary jointing and connections approved HDPE Perforated Pipe all to approval as decribed in:				
D	200mm Diameter main drain.	LM	370		
	<u>Hesian Filter Fabric</u>				
E	Supply and lay approved hesian Filter Fabric to french drains girth 600mm wide.	LM	370		
F	Ditto girth 300mm wide.	LM	340		
	Carried to collection				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Drain Fillings.</u>				
A	Approved imported hardcore fillings over perforated underground pipe in main drain.	CM	53		
B	Ditto above formation level on subdrains.	CM	31		
C	Supply and place approved 200mm graded aggregates ballast fillings over perforated underground pipe in main drain.	CM	89		
D	Ditto above formation level on subdrains.	CM	20		
E	Supply and place approved sand fillings over perforated underground pipe in main drain.	CM	44		
F	Ditto above formation level on subdrains.	CM	20		
	<u>Inspection chambers</u>				
G	Construct 600 wide x 600 mm long x 1500 mm deep (internal dimensions) storm water manhole, comprising 150 mm thick concrete class 20 bed, 200 mm thick natural stonewalling in cement and sand (1:3) mortar, 150 mm thick concrete class 20 cover slab with requisite reinforcement, 450x 600 mm heavy duty cast iron cover and frame bedded in cement and sand (1:3) mortar; internally plastered & screeded in 15 mm thick lime plaster; 100 mm thick concrete class 20 benching; complete with necessary excavation, formwork and 2 No. connections to pipes not exceeding 200 mm diameter(pipe m/s)	No	14		
	Carried to collection				
	<u>Collection:</u>				
	Brought forward from page no.:	3			
	Brought forward from page no.:	Above			
	TOTAL FOR WATER DRAINAGE AROUND THE PITCH CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 4 - TERRACES (All provisional)</u>				
	<u>Excavations.</u> (Contractor to allow for carefull upholding of sides of excavations. All measureemnts are net and allow for extra excavations for working space as it will be necessitated by the site conditions).				
	<u>Oversite Excavations.</u>				
A	Excavate oversite average 200mm thick and collect the soil and cart away from site as directed.	SM	1,610		
	<u>Excavation for foundations.</u>				
A	Excavate for strip foundation starting from reduced level and not exceeding 1.50m deep	CM	840		
B	Ditto exceeding 1.5m deep but not exceeding 3.0m deep.	CM	1		
C	Extra over for excavation in soft rock.	CM	420		
	<u>Disposal of excavated materials</u>				
D	Return fill and ram selected excavated materials around foundations.	CM	1,046		
E	Remove excavated materials from site as directed.	CM	215		
	<u>Planking and Water exclusion</u>				
F	Allow for planking and strutting to uphold sides of excavations	Item	1		
G	Ditto but keeping all excavations free from running or underground water by pumping or pailing	Item	1		
	<u>Concrete works</u>				
	<u>Mass concrete (class 15/20) in;</u>				
H	50mm thick blinding under strip footing	SM	840		
	<u>In-situ vibrated reinforced concrete (class 25/25mm) in;</u>				
I	Strip footing	CM	168		
J	Columns	CM	44		
K	Steps	CM	20		
L	Cast insitu coping	Cm	56		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ALL PROVISIONAL</u>				
	<u>Supply and fix steel reinforcement including cutting, bending, hooking, tying and supporting as required</u>				
	<u>High yield tensile square twisted bars to B.S 4461 and K.S 02.22:1976</u>				
A	Assorted Reinforcement bars of various sizes	KG	24,108		
	<u>Sawn formwork to:</u>				
B	Sides of strip foundation.	SM	560		
C	Sides of columns.	SM	877		
C	Sides and soffits of Coping beams	SM	840		
	<u>Foundation Walling.</u>				
	Approved Load bearing natural stone walling bedded and jointed in cement sand (1:4) mortar including 25mm x 20 gauge hoop iron reinforcement at every alternate course				
D	200mm thick walling	SM	1,400		
	<u>TERRACE WALLING</u>				
	<u>Selected fine dressed natural stone walling with a minimum of 7.0N/mm² average compressive strength to B.S. 5390; bedded and jointed in cement and sand mortar (1:4) to approval</u>				
E	200mm thick; reinforced every alternate course with 25mm x 3mm hoop iron wall ties	SM	1,418		
	<u>Precast concrete trimmings finished fair on all exposed faces.</u>				
G	375 x 75mm thick concrete coping reinforced with BS. 4482 BRC mesh.	LM	792		
	<u>Keying Finish to exposed wall surfaces.</u>				
H	Horizontal raking/ keying and flush vertical joints all to approval.	SM	933		
	<u>Weep Holes.</u>				
I	Supply and fix 150mm UPVC pipe 250mm long as weep holes across 200mm thick wall with and including all necessary chasing and finish all around them.	NO	933		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Fillings</u>				
A	Imported and approved murrum backfill materials as infill to terraces walls, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layers not exceeding 150mm Thick to Engineer's approval	CM	735		
B	Ditto but Pick and use selected excavated materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layer of 150mm Thick to Engineer's approval	CM	735		
	<u>300mm thick ammended planting top soil.</u>				
C	Pick from excavation and use selected excavated vegetable soil and lay to 300mm Thick to be ploughed, disked, graded and chain harrowed for a smooth surface with even falls and a fine tilth for seeding including removal of weeds. Ameliorants (cow manure mixed at 1:2 of top soil) and fertilizer (11:6:9 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) to be mixed into the top soil to receive natural lawn (Pennisetum clandestinum) (m.s)	SM	1,470		
	<u>FINISHINGS</u>				
	<u>Natural Grass finish</u>				
D	Natural Paspalum Grass (or equivalent) on 150mm deep ammended top soil media (m.s) on 100mm well compacted fine sand (m.s) to receive fertilizer 4:1:3 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) 9-12 months after lawn seeding, and annualy thereafter to specialist specifications	SM	1,470		
	<u>Channels</u>				
E	Provide, lay and joint Channel, 125x150mm flush channel block, laid on and including 450x100mm concrete (1:3:6) bed and 100x200mm haunching behind ancluding any necessary formwork and disposal of surplus material as directed.	LM	360		
	<u>Approved plant hedging behind top terrace.</u>				
F	Supply and plant (duranta) approved size plantings to act as hedging behind top terrace with and including watering and maintenance for six months until fully established.	No	1,167		
	Carried to collection				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	Collection:				
	Brought forward from page H.P.A/5				
	Brought forward from page H.P.A/6				
	Brought forward from page H.P.A/7				
	TOTAL FOR TERRACES CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 5 - STONE PITCHING (All provisional)</u>				
	<u>Trimming and compacting of excavated and filled made up ground to slope</u>				
A	Trim and compact excavated and filled made up ground to receive stone pitching and cart away arising excess excavated materials	SM	1,152		
	<u>Stone Pitching.</u>				
B	Vegetated Stone pitching with natural stone interlocked into place. Flattest face of Stone to be laid and to produce Smooth and Even Surface, seeding in joints to encourage vegetation.	SM	1,152		
	TOTAL FOR STONE PITCHING CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT 6: GOAL POSTS</u>				
	<u>Excavation</u>				
A	Excavation for Goal post sockets diameter 150mm wide average depth not exceeding 1500 mm from formed level.	CM	2		
	<u>Load cart away</u>				
B	Load cart away surplus excavated materials to spoil heaps as directed on site.	CM	2		
	<u>In-situ vibrated reinforced concrete (class 25/25mm) in;</u>				
C	Socket - bases & stud columns	CM	1		
	<u>Reinforcement to V.R.C. - High yeild square twisted bars to B.S. 4461 and K.S 02.22:1976: including bends, hooks and tying wire</u>				
D	Assorted reinforcement bars of various sizes	KG	200		
	<u>Formwork</u>				
E	Sawn formwork with one coat of an approved retarding agent to vertical sides of socket bases	SM	8		
	<u>Mild steel work in:-</u>				
F	Achoring system anchoring in concrete including neoprene caps all as per manufacturer's instructions.	NO	4		
G	Ditto in safety netting	NO	44		
H	150mm Diamater x 4mm thick heavily padded CHS sockets all removable.	LM	10		
I	Ditto in safety netting	LM	110		
J	8mm mild steel plate as backboard material welded into posts	SM	11		
	<u>Galvanised steel posts</u>				
K	80mm Diamater x 4mm thick CHS goal post plugged into sockets.	LM	40		
	<u>Mesh NET</u>				
L	20mm steel mesh or white cotton mesh welded to posts all to specialist details and sports regulations.	SM	24		
M	Ditto in safety netting	SM	320		
	TOTAL FOR GOAL POSTS CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
A	<p><u>ELEMENT NO. 7 - PRIME COSTS AND PROVISIONAL SUMS</u></p> <p><u>PROVISIONAL COST SUMS</u></p> <p>Provide a sum of KENYA SHILLINGS FOR FOURTY THOUSAND (40,000.00) only for refuse bins</p>				40,000.0
	TOTAL ELEMENT NO. 07 : PRIME COSTS AND PROVISIONAL SUMS CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>SUMMARY FOR BILL NO. 07 - HOCKEY PITCH A.</u>				
	<u>ELEMENT</u>				
1	EXCAVATIONS				
2	HOCKEY PITCH				
5	WATER DRAINAGE AROUND THE PITCH				
6	TERRACES				
7	STONE PITCHING				
8	GOAL POSTS				
7	PRIME COSTS AND PROVISIONAL SUMS.				
	TOTAL ESTIMATE FOR BILL NO. 7 - HOCKEY PITCH A CARRIED TO GRAND SUMMARY				

BILL NO. 07

HOCKEY PITCH B

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>BILL NO. 07 : HOCKEY PITCH B</u>				
	<u>ELEMENT NO. 1 - EXCAVATIONS (All provisional)</u>				
	<u>Oversite Excavation</u>				
A	Excavate oversite average 100mm deep starting from existing ground level to remove vegetable soil and cart away.	SM	9,417		
B	Excavate to remove cotton soils and/or to reduce levels to formation, stock pile the excavated soil strategically on site for re-use as directed..	CM	2,090		
C	Extra over ditto in soft rock.	CM	209		
	<u>Filling to make up levels</u>				
D	Use selected excavated materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layer of 200mm Thick to Engineer's approval	CM	1,140		
E	Load and cart away excess excavated materials as directed on site.	CM	950		
	TOTAL FOR EXCAVATIONS CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
<u>ELEMENT NO. 2 - HOCKEY PITCH (All provisional)</u>					
<u>Sub-Grade</u>					
A	Roll and compact subgrade formation to achieve 98% modified proctors MDD including grading to falls and crossfalls	SM	6,695		
B	Imported and approved murram backfill materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in layers not exceeding 150mm Thick to Engineer's approval	CM	1,339		
<u>Fillings</u>					
C	Pick from excavations and use selected excavated vegetable soil and lap to 150mm thick to be ploughed, disked, graded and chain harrowed for a smooth surface with even falls and a fine tilth for seeding including removal of weeds. Ameliorants (cow manure mixed at 1:2 of top soil) and fertilizer (11:6:9 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) to be mixed into the top soil to receive natural lawn (<i>Pennisetum clandestinum</i>) (m.s)	SM	6,695		
<u>FINISHINGS</u>					
<u>Natural finish</u>					
D	Natural lawn Arabica Grass (or equivalent) on 150mm deep amended top soil media (m.s) on 100mm well compacted fine sand (m.s) to receive fertilizer 4:1:3 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) 9-12 months after lawn seeding, and annually thereafter to specialist specifications . Contractor to allow for watering and maintenance for six months till fully established. Contractor to allow for watering and maintenance for six months till fully established.	SM	6,695		
<u>Channels</u>					
E	Provide, lay and joint Channel, 125x150mm flush channel block, laid on and including 450x100mm concrete (1:3:6) bed and 100x200mm haunching behind including any necessary formwork and disposal of surplus material as directed.	LM	360		
TOTAL FOR HOCKEY PITCH B CARRIED TO SUMMARY					

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<p><u>ELEMENT NO. 3 - WATER DRAINAGE AROUND THE PITCH</u></p> <p><u>FRENCH DRAIN</u></p> <p><u>Oversite Excavation</u> <u>(All excavations Measured Net)</u></p> <p>Excavate for French Drain average depth not exceeding 1500mm Deep, uphold the sides of excavation, keep excavations free from water, trim and compact the bottom of excavation to level and cart away the resultant excavated materials as directed on site as described in:</p>				
A	Main-drain	CM	315		
B	Ditto to Sub-drain	CM	204		
	<p><u>Mass concrete (class 15/20) in:</u></p> <p>50mm Thick Class 15/20 mass concrete blinding to bottom of trenches to receive drain pipe as described in:</p>				
C	Main-drain	SM	210		
	<p><u>Underground Drain Pipe.</u></p> <p>Supply, lay including necessary jointing and connections approved HDPE Perforated Pipe all to approval as described in:</p>				
D	200mm Diameter main drain.	LM	350		
	<p><u>Hesian Filter Fabric</u></p>				
E	Supply and lay approved hesian Filter Fabric to french drains girth 600mm wide.	LM	350		
F	Ditto girth 300mm wide.	LM	340		
	Carried to collection				

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD,
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Drain Fillings.</u>				
A	Approved imported hardcore fillings over perforated underground pipe in main drain.	CM	50		
B	Ditto above formation level on subdrains.	CM	31		
C	Supply and place approved 200mm graded aggregates ballast fillings over perforated underground pipe in main drain.	CM	84		
D	Ditto above formation level on subdrains.	CM	20		
E	Supply and place approved sand fillings over perforated underground pipe in main drain.	CM	42		
F	Ditto above formation level on subdrains.	CM	20		
	<u>Inspection chambers</u>				
G	Construct 600 wide x 600 mm long x 1500 mm deep (internal dimensions) storm water manhole, comprising 150 mm thick concrete class 20 bed, 200 mm thick natural stonewalling in cement and sand (1:3) mortar, 150 mm thick concrete class 20 cover slab with requisite reinforcement, 450x 600 mm heavy duty cast iron cover and frame bedded in cement and sand (1:3) mortar; internally plastered & screeded in 15 mm thick lime plaster; 100 mm thick concrete class 20 benching; complete with necessary excavation, formwork and 2 No. connections to pipes not exceeding 200 mm diameter (pipe m/s)	No	13		
	Carried to collection				
	<u>Collection:</u>				
	Brought forward from page no.:	3			
	Brought forward from page no.:	Above			
	TOTAL FOR WATER DRAINAGE AROUND THE PITCH CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 4 - TERRACES (All provisional)</u>				
	<u>Excavations.</u> (Contractor to allow for carefull upholding of sides of excavations. All measureemnts are net and allow for extra excavations for working space as it will be necessitated by the site conditions).				
	<u>Oversite Excavations.</u>				
A	Excavate oversite average 200mm thick and collect the soil and cart away from site as directed.	SM	1,610		
	<u>Excavation for foundations.</u>				
A	Excavate for strip foundation starting from reduced level and not exceeding 1.50m deep	CM	840		
B	Ditto exceeding 1.5m deep but not exceeding 3.0m deep.	CM	1		
C	Extra over for excavation in soft rock.	CM	420		
	<u>Disposal of excavated materials</u>				
D	Return fill and ram selected excavated materials around foundations.	CM	1,046		
E	Remove excavated materials from site as directed.	CM	215		
	<u>Planking and Water exclusion</u>				
F	Allow for planking and strutting to uphold sides of excavations	Item	1		
G	Ditto but keeping all excavations free from running or underground water by pumping or pailing	Item	1		
	<u>Concrete works</u>				
	<u>Mass concrete (class 15/20) in;</u>				
H	50mm thick blinding under strip footing	SM	840		
	<u>In-situ vibrated reinforced concrete (class 25/25mm) in;</u>				
I	Strip footing	CM	168		
J	Columns	CM	44		
K	Steps	CM	20		
L	Cast insitu coping	Cm	56		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ALL PROVISIONAL</u>				
	<u>Supply and fix steel reinforcement including cutting, bending, hooking, tying and supporting as required</u>				
	<u>High yield tensile square twisted bars to B.S 4461 and K.S 02.22:1976</u>				
A	Assorted Reinforcement bars of various sizes	KG	24,108		
	<u>Sawn formwork to;</u>				
B	Sides of strip foundation.	SM	560		
C	Sides of columns.	SM	877		
C	Sides and soffits of Coping beams	SM	840		
	<u>Foundation Walling.</u>				
	Approved Load bearing natural stone walling bedded and jointed in cement sand (1:4) mortar including 25mm x 20 gauge hoop iron reinforcement at every alternate course				
D	200mm thick walling	SM	1,400		
	<u>TERRACE WALLING</u>				
	<u>Selected fine dressed natural stone walling with a minimum of 7.0N/mm2 average compressive strength to B.S. 5390; bedded and jointed in cement and sand mortar (1:4) to approval</u>				
E	200mm thick; reinforced every alternate course with 25mm x 3mm hoop iron wall ties	SM	1,418		
	<u>Precast concrete trimmings finished fair on all exposed faces.</u>				
G	375 x 75mm thick concrete coping reinforced with BS. 4482 BRC mesh.	LM	792		
	<u>Keying Finish to exposed wall surfaces.</u>				
H	Horizontal raking/ keying and flush vertical joints all to approval.	SM	933		
	<u>Weep Holes.</u>				
I	Supply and fix 150mm UPVC pipe 250mm long as weep holes across 200mm thick wall with and including all necessary chasing and finish all around them.	NO	933		
	Carried to Collection				

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD,
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Fillings</u>				
A	Imported and approved murram backfill materials as infill to terraces walls, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layers not exceeding 150mm Thick to Engineer's approval	CM	735		
B	Ditto but Pick and use selected excavated materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layer of 150mm Thick to Engineer's approval	CM	735		
	<u>300mm thick ammended planting top soil.</u>				
C	Pick from excavation and use selected excavated vegetable soil and lay to 300mm Thick to be ploughed, disked, graded and chain harrowed for a smooth surface with even falls and a fine tilth for seeding including removal of weeds. Ameliorants (cow manure mixed at 1:2 of top soil) and fertilizer (11:6:9 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) to be mixed into the top soil to receive natural lawn (Pennisetum clandestinum) (m.s)	SM	1,470		
	<u>FINISHINGS</u>				
	<u>Natural Grass finish</u>				
D	Natural Paspalum Grass (or equivalent) on 150mm deep ammended top soil media (m.s) on 100mm well compacted fine sand (m.s) to receive fertilizer 4:1:3 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) 9-12 months after lawn seeding, and annualy thereafter to specialist specifications	SM	1,470		
	<u>Channels</u>				
E	Provide, lay and joint Channel, 125x150mm flush channel block, laid on and including 450x100mm concrete (1:3:6) bed and 100x200mm haunching behind ancluding any necessary formwork and disposal of surplus material as directed.	LM	360		
	<u>Approved plant hedging behind top terrace.</u>				
F	Supply and plant (duranta) approved size plantings to act as hedging behind top terrace with and including watering and maintenance for six months until fully established.	No	1,167		
	Carried to collection				

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD,
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Collection:</u>				
	Brought forward from page H.P.A/5				
	Brought forward from page H.P.A/6				
	Brought forward from page H.P.A/7				
	TOTAL FOR TERRACES CARRIED TO SUMMARY				

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD,
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 5 - STONE PITCHING (All provisional)</u>				
	<u>Trimming and compacting of excavated and filled made up ground to slope</u>				
A	Trim and compact excavated and filled made up ground to receive stone pitching and cart away arising excess excavated materials	SM	691		
	<u>Stone Pitching.</u>				
B	Vegetated Stone pitching with natural stone interlocked into place. Flattest face of Stone to be laid and to produce Smooth and Even Surface, seeding in joints to encourage vegetation	SM	691		
	TOTAL FOR STONE PITCHING CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT 6: GOAL POSTS</u>				
	<u>Excavation</u>				
A	Excavation for Goal post sockets diameter 150mm wide average depth not exceeding 1500 mm from formed level.	CM	2		
	<u>Load cart away</u>				
B	Load cart away surplus excavated materials to spoil heaps as directed on site.	CM	2		
	<u>In-situ vibrated reinforced concrete (class 25/25mm) in:</u>				
C	Socket - bases & stud columns	CM	1		
	<u>Reinforcement to V.R.C. - High yeild square twisted bars to B.S. 4461 and K.S 02.22:1976: including bends, hooks and tying wire</u>				
D	Assorted reinforcement bars of various sizes	KG	200		
	<u>Formwork</u>				
E	Sawn formwork with one coat of an approved retarding agent to vertical sides of socket bases	SM	8		
	<u>Mild steel work in:-</u>				
F	Achoring system anchoring in concrete including neoprene caps all as per manufacturer's instructions.	NO	4		
G	Ditto in safety netting	NO	44		
H	150mm Diamater x 4mm thick heavily padded CHS sockets all removable.	LM	10		
I	Ditto in safety netting	LM	110		
J	8mm mild steel plate as backboard material welded into	SM	11		
	<u>Galvanised steel posts</u>				
K	80mm Diamater x 4mm thick CHS goal post plugged into	LM	40		
	<u>Mesh NET</u>				
L	20mm steel mesh or white cotton mesh welded to posts all to specialist details and sports regulations.	SM	24		
M	Ditto in safety netting	SM	320		
	TOTAL FOR GOAL POSTS CARRIED TO SUMMARY				

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD,
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
A	<p><u>ELEMENT NO. 7 - PRIME COSTS AND PROVISIONAL SUMS</u></p> <p><u>PROVISIONAL COST SUMS</u></p> <p>Provide a sum of KENYA SHILLINGS FOR FOURTY THOUSAND (40,000.00) only for refuse bins</p>				40,000.0
	TOTAL ELEMENT NO. 07 : PRIME COSTS AND PROVISIONAL SUMS CARRIED TO SUMMARY				

PROPOSED SPORTS FIELDS FOR MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD,
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>SUMMARY FOR BILL NO. 07 - HOCKEY PITCH B.</u>				
	<u>ELEMENT</u>				
1	EXCAVATIONS				
2	HOCKEY PITCH				
5	WATER DRAINAGE AROUND THE PITCH				
6	TERRACES				
7	STONE PITCHING				
8	GOAL POSTS				
7	PRIME COSTS AND PROVISIONAL SUMS.				
	TOTAL ESTIMATE FOR BILL NO. 7 - HOCKEY PITCH B CARRIED TO GRAND SUMMARY				

BILL NO. 08

BASKETBALL COURT A & B

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>BILL NO. 08 : BASKET BALL PITCH</u>				
	<u>ELEMENT NO. 1 - EXCAVATIONS (All provisional)</u>				
	<u>Oversite Excavation</u>				
A	Excavate oversite average 100mm deep starting from existing ground level to remove vegetable soil and cart away.	SM	1,850		
B	Excavate to remove cotton soils and/or to reduce levels to formation, stock pile the excavated soil strategically on site for re-use as directed..	CM	648		
C	Load and cart away excess excavated materials as directed on site.	CM	648		
	TOTAL FOR EXCAVATIONS CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 2 - BASKET BALL COURT (All provisional)</u>				
	<u>Sub-Grade</u>				
A	Roll and compact subgrade formation to achieve 98% modified proctors MDD including grading to falls and crossfalls	SM	1,148		
B	Imported and approved murrum backfill materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in layers not exceeding 150mm Thick to Engineer's approval	CM	402		
	<u>Sub-Base</u>				
C	150mm thick Compacted gravel 3.5mm in sub-base laid at a slope of 1% well watered and compacted to 98% MDD at optimum moisture content in layers each of 150mm Thick to Engineer's approval	SM	1,148		
	<u>FINISHINGS</u>				
	<u>ASPHALT FINISH</u>				
D	Prepare surface and spray MC-30 as a prime coat cutback bitumen at a rate of 0.8 -1.0 lt/m ² as prime coat.	SM	1,148		
E	Prepare primed surfaces, provide and spray K1-60 bitumen emulsion as tack coat at a spray rate of 0.8 - 1.0 lt/m ² as directed by Engineer.	SM	1,148		
F	75mm thick Asphalt concrete for surfacing	SM	1,148		
	<u>Channels</u>				
G	Provide, lay and joint Channel, 125x150mm flush channel block, laid on and including 450x100mm concrete (1:3:6) bed and 100x200mm haunching behind including any necessary formwork and disposal of surplus material as directed.	LM	138		
	TOTAL FOR BASKET BALL COURTS CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<p><u>ELEMENT NO. 3 - WATER DRAINAGE AROUND THE PITCH</u></p> <p><u>FRENCH DRAIN</u></p> <p><u>Oversite Excavation</u> <u>(All excavations Measured Net)</u></p> <p>Excavate for French Drain average depth not exceeding 1500mm Deep, uphold the sides of excavation, keep excavations free from water, trim and compact the bottom of excavation to level and cart away the resultant excavated materials as directed on site as described in:</p>				
A	Main-drain	CM	194		
B	Ditto to Sub-drain	CM	12		
	<p><u>Mass concrete (class 15/20) in;</u></p> <p>50mm Thick Class 15/20 mass concrete blinding to bottom of trenches to receive drain pipe as described in:</p>				
C	Main-drain	SM	130		
	<p><u>Underground Drain Pipe.</u></p> <p>Supply, lay including necessary jointing and connections approved HDPE Perforated Pipe all to approval as described in:</p>				
D	200mm Diameter main drain.	LM	216		
	<p><u>Hesian Filter Fabric</u></p>				
E	Supply and lay approved hesian Filter Fabric to french drains girth 600mm wide.	LM	216		
F	Ditto girth 300mm wide.	LM	68		
	Carried to collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Drain Fillings.</u>				
A	Approved imported hardcore fillings over perforated underground pipe in main drain.	CM	31		
B	Ditto above formation level on subdrains.	CM	6		
C	Supply and place approved 200mm graded aggregates ballast fillings over perforated underground pipe in main drain.	CM	52		
D	Ditto above formation level on subdrains.	CM	4		
E	Supply and place approved sand fillings over perforated underground pipe in main drain.	CM	26		
F	Ditto above formation level on subdrains.	CM	4		
	<u>Inspection chambers</u>				
G	Construct 600 wide x 600 mm long x 1500 mm deep (internal dimensions) storm water manhole, comprising 150 mm thick concrete class 20 bed, 200 mm thick natural stonewalling in cement and sand (1:3) mortar, 150 mm thick concrete class 20 cover slab with requisite reinforcement, 450x 600 mm heavy duty cast iron cover and frame bedded in cement and sand (1:3) mortar; internally plastered & screeded in 15 mm thick lime plaster; 100 mm thick concrete class 20 benching; complete with necessary excavation, formwork and 2 No. connections to pipes not exceeding 200 mm diameter(pipe m/s)	No	14		
	Carried to collection				
	<u>Collection:</u>				
	Brought forward from page BP/3				
	Brought forward from page Above				
	TOTAL FOR WATER DRAINAGE AROUND THE PITCH CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 4 - TERRACES (All provisional)</u>				
	<u>Excavations.</u>				
	(Contractor to allow for carefull upholding of sides of excavations. All measureemnts are net and allow for extra excavations for working space as it will be necessitated by the site conditions).				
	<u>Oversite Excavations.</u>				
A	Excavate oversite average 200mm thick and collect the soil and cart away from site as directed.	SM	782		
	<u>Excavation for foundations.</u>				
A	Excavate for strip foundation starting from reduced level and not exceeding 1.50m deep	CM	408		
B	Ditto exceeding 1.5m deep but not exceeding 3.0m deep.	CM	2		
C	Extra over for excavation in soft rock.	CM	2		
	<u>Disposal of excavated materials</u>				
D	Return fill and ram selected excavated materials around foundations.	CM	273		
E	Remove excavated materials from site as directed.	CM	139		
	<u>Planking and Water exclusion</u>				
F	Allow for planking and strutting to uphold sides of excavations	Item	1		
G	Ditto but keeping all excavations free from running or underground water by pumping or pailing	Item	1		
	<u>Concrete works</u>				
	<u>Mass concrete (class 15/20) in;</u>				
H	50mm thick blinding under strip footing	SM	408		
	<u>In-situ vibrated reinforced concrete (class 25/25mm) in;</u>				
I	Strip footing	CM	82		
J	Columns	CM	21		
K	Steps	CM	2		
L	Cast insitu coping	Cm	41		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ALL PROVISIONAL</u>				
	<u>Supply and fix steel reinforcement including cutting, bending, hooking, tying and supporting as required</u>				
	<u>High yield tensile square twisted bars to B.S 4461 and K.S 02.22:1976:</u>				
A	Assorted Reinforcement bars of various sizes	KG	12,906		
	<u>Sawn formwork to:</u>				
B	Sides of strip foundation.	SM	272		
C	Sides of columns.	SM	517		
C	Sides and soffits of Coping beams	SM	408		
	<u>Foundation Walling.</u>				
	Approved Load bearing natural stone walling bedded and jointed in cement sand (1:4) mortar including 25mm x 20 gauge hoop iron reinforcement at every alternate course				
D	200mm thick walling	SM	680		
	<u>TERRACE WALLING</u>				
	<u>Selected fine dressed natural stone walling with a minimum of 7.0N/mm² average compressive strength to B.S. 5390; bedded and jointed in cement and sand mortar (1:4) to approval</u>				
E	200mm thick; reinforced every alternate course with 25mm x 3mm hoop iron wall ties	SM	2,754		
	<u>Keying Finish to exposed wall surfaces.</u>				
H	Horizontal raking/ keying and flush vertical joints all to approval.	SM	306		
	<u>Weep Holes.</u>				
I	Supply and fix 150mm UPVC pipe 250mm long as weep holes across 200mm thick wall with and including all necessary chasing and finish all around them.	NO	1,360		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Fillings</u>				
A	Imported and approved murrum backfill materials as infill to terraces walls, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layers not exceeding 150mm Thick to Engineer's approval	CM	209		
B	Ditto but Pick and use selected excavated materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layer of 150mm Thick to Engineer's approval	CM	209		
	<u>300mm thick ammended planting top soil.</u>				
C	Pick from excavation and use selected excavated vegetable soil and lay to 300mm Thick to be ploughed, disked, graded and chain harrowed for a smooth surface with even falls and a fine tilth for seeding including removal of weeds. Ameliorants (cow manure mixed at 1:2 of top soil) and fertilizer (11:6:9 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) to be mixed into the top soil to receive natural lawn (Pennisetum clandestinum) (m.s)	SM	714		
	<u>FINISHINGS</u>				
	<u>Natural Grass finish</u>				
D	Natural Paspalum Grass (or equivalent) on 150mm deep ammended top soil media (m.s) on 100mm well compacted fine sand (m.s) to receive fertilizer 4:1:3 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) 9-12 months after lawn seeding, and annually thereafter to specialist specifications . Contractor to allow for watering and maintenance for six months till fully established.	SM	714		
	<u>Channels</u>				
E	Provide, lay and joint Channel, 125x150mm flush channel block, laid on and including 450x100mm concrete (1:3:6) bed and 100x200mm haunching behind ancluding any necessary formwork and disposal of surplus material as directed.	LM	170		
	Carried to collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
A	<p><u>Approved plant hedging behind top terrace.</u></p> <p>Supply and plant (duranta) approved size plantings to act as hedging behind top terrace with and including watering and maintenance for six months until fully established.</p>	No	1,133		
	Carried to collection				
	<p><u>Collection:</u></p> <p>Brought forward from page BC/5</p> <p>Brought forward from page BC/6</p> <p>Brought forward from page BC/7</p> <p>Brought forward from page BC/8</p>				
	TOTAL FOR TERRACES CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 5 - BASKET BALL GOAL POSTS</u>				
	<u>Excavation</u>				
A	Excavation for Goal post sockets diameter 150mm wide average depth not exceeding 1500 mm from formed level.	CM	4		
	<u>Load cart away</u>				
B	Load cart away surplus excavated materials to spoil heaps as directed on site.	CM	4		
	<u>In-situ vibrated reinforced concrete (class 25/25mm) in:</u>				
C	Socket - bases & stud columns	CM	4		
	<u>Reinforcement to V.R.C. - High yield tensile square twisted bars to B.S 4461 and K.S 02.22:1976: including bends, hooks and tying wire</u>				
D	Assorted reinforcement bars of various sizes	KG	400		
	<u>Formwork</u>				
E	Sawn formwork with one coat of an approved retarding agent to vertical sides of socket bases	SM	16		
	<u>Mild steel work in:-</u>				
F	Achoring system anchoring in concrete including neoprene caps all as per manufacturer's instructions.	NO	8		
G	150mm Diameter x 4mm thick CHS sockets all removable.	LM	60		
	<u>Prime stop and apply one undercoat and two finishing coats of gloss paint to CROWN PAINTS first quality or other equal and approved to metal surfaces of:</u>				
H	General metal surfaces	LM	60		
	Carried to collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Goal net and ring</u>				
A	Standard goal net and ring all to approval welded to steel post.	NO	4		
B	25mm thick fibre glass block board all fixe to approval	SM	8		
C	Supply and fix 100mm thick polytheylene foam padding	SM	8		
D	Supply and fix 25mm thick rubber tubing all around 150mm diameter vertical posts	LM	12		
	Carried to collection				
	<u>Collection:</u>				
	Brought forward from page BC/9				
	Brought forward from page above				
	TOTAL FOR GOAL POSTS CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>SUMMARY FOR BILL NO. 08 BASKET BALL PITCH</u>				
	<u>ELEMENT</u>				
1	EXCAVATIONS				
2	BASKET BALL COURT				
3	WATER DRAINAGE AROUND PITCH				
4	TERRACES				
5	BASKET GOAL POSTS				
	TOTAL ESTIMATES FOR BILL NO. 8 - BASKET BALL PITCH A & B CARRIED TO GRAND SUMMARY.				

BILL NO. 09

RUGBY PITCH

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>BILL NO. 09 : RUGBY PITCH.</u>				
	<u>ELEMENT NO. 1 - EXCAVATIONS (All provisional)</u>				
	<u>Oversite Excavation</u>				
A	Excavate oversite average 100mm deep starting from existing ground level to remove vegetable soil and cart away.	SM	14,820		
B	Excavate to remove cotton soils and/or to reduce levels to formation, stock pile the excavated soil strategically on site for re-use as directed..	CM	41,496		
C	Extra over ditto in rock irrespective of class of rock	CM	8,299		
	<u>Filling to make up levels</u>				
D	Use selected excavated materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layer of 200mm Thick to Engineer's approval	CM	30,179		
E	Load and cart away excess excavated materials as directed on site.	CM	11,317		
	TOTAL FOR EXCAVATIONS CARRIED TO SUMMARY				

**PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.**

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 2 - RUGBY PITCH (All provisional)</u>				
	<u>Sub-Grade</u>				
A	Roll and compact subgrade formation to achieve 98% modified proctors MDD including grading to falls and crossfalls	SM	9,600		
B	Imported and approved murrum backfill materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layers not exceeding 150mm Thick to Engineer's approval	CM	1,440		
C	Supply and lay graded Murrum average 200mm Thick laid at a slope of 1:5%, well watered and compacted to 98% MDD at optimum moisture content in 2 layers each of 100mm Thick to Engineer's approval.	SM	9,600		
	<u>Fillings</u>				
D	Pick from excavations and use selected excavated vegetable soil and lap to 150mm thick to be ploughed, disked, graded and chain harrowed for a smooth surface with even falls and a fine tilth for seeding including removal of weeds. Ameliorants (cow manure mixed at 1:2 of top soil) and fertilizer (11:6:9 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) to be mixed into the top soil to receive natural lawn (Pennisetum clandestinum) (m.s)	SM	9,600		
	<u>FINISHINGS</u>				
	<u>Natural finish</u>				
E	Natural lawn Arabica Grass (or equivalent) on 150mm deep amended top soil media (m.s) on 100mm well compacted fine sand (m.s) to receive fertilizer 4:1:3 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) 9-12 months after lawn seeding, and annually thereafter to specialist specifications . Contractor to allow for watering and maintenance for six months till fully established.	SM	9,600		
	<u>Channels</u>				
F	Provide, lay and joint Channel, 125x150mm flush channel block, laid on and including 450x100mm concrete (1:3:6) bed and 100x200mm haunching behind including any necessary formwork and disposal of surplus material as directed.	LM	400		
	TOTAL FOR SOCCER PITCH CARRIED TO COLLECTION				

SPORTS FIELDS FOR M.U.S.T

BILL NO. 09: RUGBY PITCH

QUANTI-BILL CONSULTS CO. LTD

MARCH 2020

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 3 - LAWN SURROUND (All provisional)</u>				
	<u>Sub-Grade</u>				
A	Roll and compact subgrade formation to achieve 98% modified proctors MDD including grading to falls and crossfalls	SM	2,800		
B	Imported and approved murrum backfill materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in layers not exceeding 150mm Thick to Engineer's approval	CM	700		
C	Supply and lay graded Murrum average 200mm Thick laid at a slope of 1:0%, well watered and compacted to 98% MDD at optimum moisture content in 2 layers each of 100mm Thick to Engineer's approval.	SM	2,800		
	<u>150mm thick ammended top planting soil</u>				
D	Pick from excavations and use selected excavated vegetable soil and lap to 150mm thick to be ploughed, disked, graded and chain harrowed for a smooth surface with even falls and a fine tilth for seeding including removal of weeds. Ameliorants (cow manure mixed at 1:2 of top soil) and fertilizer (11:6:9 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) to be mixed into the top soil to receive natural lawn (Pennisetum clandestinum) (m.s)	SM	2,800		
	<u>FINISHINGS</u>				
	<u>Natural finish</u>				
E	Natural Paspalum Grass (or equivalent) on 150mm deep ammended top soil media (m.s) on 100mm well compacted fine sand (m.s) to receive fertilizer 4:1:3 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) 9-12 months after lawn seeding, and annually thereafter to specialist specifications	SM	2,800		
	TOTAL FOR LAWN SURROUND CARRIED TO COLLECTION				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<p><u>ELEMENT NO. 4 - WATER DRAINAGE AROUND THE PITCH</u></p> <p><u>FRENCH DRAIN</u></p> <p><u>Oversite Excavation</u> <u>(All excavations Measured Net)</u></p> <p>Excavate for French Drain average depth not exceeding 1500mm Deep, uphold the sides of excavation, keep excavations free from water, trim and compact the bottom of excavation to level and cart away the resultant excavated materials as directed on site as described in:</p>				
A	Main-drain	CM	578		
B	Ditto to Sub-drain	CM	317		
	<p><u>Mass concrete (class 15/20) in:</u></p> <p>50mm Thick Class 15/20 mass concrete blinding to bottom of trenches to receive drain pipe as described in:</p>				
C	Main-drain	SM	385		
	<p><u>Underground Drain Pipe.</u></p> <p>Supply, lay including necessary jointing and connections approved HDPE Perforated Pipe all to approval as decribed in:</p>				
D	200mm Diameter main drain.	LM	642		
	<p>Supply, lay including necessary jointing and connections approved HDPE Pipe with and including 150mm thick concrete reinforced with fabric mesh as encasing all round all to approval as decribed in:</p>				
E	200mm diameter	LM	50		
	<p><u>Hesian Filter Fabric</u></p>				
F	Supply and lay approved hesian Filter Fabric to french drains girth 600mm wide.	LM	642		
G	Ditto girth 300mm wide.	LM	528		
	Carried to collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Drain Fillings.</u>				
A	Approved imported hardcore fillings over perforated underground pipe in main drain.	CM	154		
B	Ditto above formation level on subdrains.	CM	95		
C	Supply and place approved 200mm graded aggregates ballast fillings over perforated underground pipe in main drain.	CM	154		
D	Ditto above formation level on subdrains.	CM	32		
E	Supply and place approved sand fillings over perforated underground pipe in main drain.	CM	77		
F	Ditto above formation level on subdrains.	CM	32		
	<u>Inspection chambers</u>				
G	Construct 600 wide x 600 mm long x 1500 mm deep (internal dimensions) storm water manhole, comprising 150 mm thick concrete class 20 bed, 200 mm thick natural stonewalling in cement and sand (1:3) mortar, 150 mm thick concrete class 20 cover slab with requisite reinforcement, 450x 600 mm heavy duty cast iron cover and frame bedded in cement and sand (1:3) mortar; internally plastered & screeded in 15 mm thick lime plaster; 100 mm thick concrete class 20 benching; complete with necessary excavation, formwork and 2 No. connections to pipes not exceeding 200 mm diameter (pipe m/s)	No	43		
	Carried to collection				
	<u>Collection:</u>				
	Brought forward from page no 6				
	Brought forward from above				
	TOTAL FOR WATER DRAINAGE AROUND THE PITCH CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 6 - TERRACES (All provisional)</u>				
	<u>Excavations.</u>				
	(All measureemnts are net and allow for extra excavations for working space as it will be necessitated by the site conditions).				
	<u>Oversite Excavations.</u>				
	Excavate oversite average 100mm deep starting from existing ground level to remove vegetable soil and cart away.	SM	1,656		
	<u>Excavation for foundations.</u>				
A	Excavate for strip foundation starting from reduced level and not exceeding 1.50m deep	CM	864		
B	Ditto exceeding 1.5m deep but not exceeding 3.0m deep.	CM	1		
C	Extra over for excavation in rock.	CM	432		
	<u>Disposal of excavated materials</u>				
D	Return fill and ram selected excavated materials around foundations.	CM	1,076		
E	Remove excavated materials from site as directed.	CM	221		
	<u>Planking and Water exclusion</u>				
F	Allow for planking and strutting to uphold sides of excavations	Item	1		
G	Ditto but keeping all excavations free from running or underground water by pumping or pailing	Item	1		
	<u>Concrete works</u>				
	<u>Mass concrete (class 15/20) in:</u>				
H	50mm thick blinding under strip footing	SM	864		
	<u>In-situ vibrated reinforced concrete (class 25/25mm) in:</u>				
I	Strip footing	CM	173		
J	Columns	CM	45		
K	Steps	CM	20		
L	Cast insitu coping	Cm	58		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ALL PROVISIONAL</u>				
	<u>Supply and fix steel reinforcement including cutting, bending, hooking, tying and supporting as required</u>				
	<u>High yield tensile square twisted bars to B.S 4461 and K.S 02.22:1976</u>				
A	Assorted Reinforcement bars of various sizes	KG	24,797		
	<u>Sawn formwork to;</u>				
B	Sides of strip foundation.	SM	576		
C	Sides of columns.	SM	902		
C	Sides and soffits of Coping beams	SM	864		
	<u>Foundation Walling.</u>				
	Approved Load bearing natural stone walling bedded and jointed in cement sand (1:4) mortar including 25mm x 20 gauge hoop iron reinforcement at every alternate course				
D	200mm thick walling	SM	1,440		
	<u>TERRACE WALLING</u>				
	<u>Selected fine dressed natural stone walling with a minimum of 7.0N/mm² average compressive strength to B.S. 5390; bedded and jointed in cement and sand mortar (1:4) to approval</u>				
E	200mm thick; reinforced every alternate course with 25mm x 3mm hoop iron wall ties	SM	1,458		
	<u>Keying Finish to exposed wall surfaces.</u>				
F	Horizontal raking/ keying and flush vertical joints all to approval.	SM	797		
	<u>Weep Holes.</u>				
G	Supply and fix 150mm UPVC pipe 250mm long as weep holes across 200mm thick wall with and including all necessary chasing and finish all around them.	NO	960		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Fillings</u>				
A	Imported and approved murrum backfill materials as infill to terraces walls, well watered, rolled and compacted to 98% MDD at optimum moisture content in layers not exceeding 150mm Thick to Engineer's approval	CM	1,512		
B	Ditto but Pick and use selected excavated materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layer of 150mm Thick to Engineer's approval	CM	1		
	<u>300mm thick ammended planting top soil.</u>				
C	Pick from excavations and use selected excavated vegetable soil and lap to 150mm thick to be ploughed, disked, graded and chain harrowed for a smooth surface with even falls and a fine tilth for seeding including removal of weeds. Ameliorants (cow manure mixed at 1:2 of top soil) and fertilizer (11:6:9 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) to be mixed into the top soil to receive natural lawn (Pennisetum clandestinum) (m.s)	SM	1,512		
	<u>FINISHINGS</u>				
	<u>Natural Grass finish</u>				
D	Natural Paspalum Grass (or equivalent) on 150mm deep ammended top soil media (m.s) on 100mm well compacted fine sand (m.s) to receive fertilizer 4:1:3 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) 9-12 months after lawn seeding, and annually thereafter to specialist specifications .Contractor to allow for watering and maintenance for six months till fully established.	SM	1,512		
	<u>Channels</u>				
E	Provide, lay and joint Channel, 125x150mm flush channel block, laid on and including 450x100mm concrete (1:3:6) bed and 100x200mm haunching behind ancluding any necessary formwork and disposal of surplus material as directed.	LM	360		
	<u>Approved plant hedging behind top terrace.</u>				
F	Supply and plant (duranta) approved size plantings to act as hedging behind top terrace with and including watering and maintenance for six months until fully established.	No	1,200		
	Carried to collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Collection:</u>				
	Brought forward from page RP/7				
	Brought forward from page RP/8				
	Brought forward from page RP/9				
	TOTAL FOR TERRACES CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<p><u>ELEMENT NO. 6 - STONE PITCHING (All provisional)</u></p> <p><u>Trimming and compacting of excavated and filled made up ground to slope</u></p> <p>A Trim and compact excavated and filled made up ground to receive stone pitching and cart away arising excess excavated materials</p> <p><u>Stone Pitching.</u></p> <p>B Vegetated Stone pitching with natural stone interlocked into place. Flattest face of Stone to be laid and to produce Smooth and Even Surface, seeding in joints to encourage vegetation.</p>	SM	1,840		
	TOTAL FOR STONE PITCHING CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT 7: GOAL POSTS</u>				
	<u>Excavation</u>				
A	Excavation for Goal post sockets diameter 150mm wide average depth not exceeding 1500 mm from formed level.	CM	2		
	<u>Load cart away</u>				
B	Load cart away surplus excavated materials to spoil heaps as directed on site.	CM	2		
	<u>In-situ vibrated reinforced concrete (class 25/25mm) in:</u>				
C	Socket - bases & stud columns	CM	1		
	<u>Reinforcement to V.R.C. - High yeild square twisted bars to B.S. 4461 and K.S 02.22:1976: including bends, hooks and tying wire</u>				
D	Assorted reinforcement bars of various sizes	KG	200		
	<u>Formwork</u>				
E	Sawn formwork with one coat of an approved retarding agent to vertical sides of socket bases	SM	8		
	<u>Mild steel work in:-</u>				
F	Achoring system anchoring in concrete including neoprene caps all as per manufacturer's instructions.	NO	4		
G	150mm Diamater x 4mm thick heavily padded CHS sockets all removable.	LM	11		
	<u>Aluminium goal upright</u>				
H	120mm diameter x 4mm thick aluminium goal post.	LM	40		
	<u>Prime stop and apply one undercoat and two finishing coats of gloss paint to CROWN PAINTS first quality or other equal and approved to metal surfaces of:</u>				
I	General metal surfaces	LM	11		
	<u>Football goal net</u>				
J	Standard twisted polyethylene football goal net overall size 30 meters square fixed to metal goal posts (m.s) with necessary ropes to approval	NO	2		
	TOTAL FOR GOAL POSTS CARRIED TO SUMMARY				

SPORTS FIELDS FOR M.U.S.T

BILL NO. 09: RUGBY PITCH

QUANTI-BILL CONSULTS CO. LTD

MARCH 2020

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
A	<p><u>ELEMENT NO. 7 - PRIME COSTS AND PROVISIONAL SUMS</u></p> <p><u>PROVISIONAL COST SUMS</u></p> <p>Provide a sum of KENYA SHILLINGS FOR FOURTY THOUSAND (40,000.00) only for refuse bins</p>				40,000.0
	TOTAL ELEMENT NO. 9 : PRIME COSTS AND PROVISIONAL SUMS CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>SUMMARY FOR BILL NO. 09 - RUGBY PITCH.</u>				
	<u>ELEMENT</u>				
1	EXCAVATIONS				
2	SOCCER PITCH				
3	LAWN SURROUND				
4	WATER DRAINAGE AROUND THE PITCH				
5	TERRACES				
6	STONE PITCHING				
7	GOAL POSTS				
8	PROVISIONAL SUMS.				
	TOTAL ESTIMATE FOR BILL NO. 09 - RUGBY PITCH CARRIED TO GRAND SUMMARY				

BILL NO. 10

TENNIS COURTS

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>BILL NO. 10 : TENNIS COURT</u>				
	<u>ELEMENT NO. 1 - EXCAVATIONS (All provisional)</u>				
	<u>Oversite Excavation</u>				
A	Excavate oversite average 100mm deep starting from existing ground level to remove vegetable soil and cart away.	SM	2,279		
B	Excavate to remove cotton soils and/or to reduce levels to formation, stock pile the excavated soil strategically on site for re-use as directed..	CM	798		
C	Load and cart away excess excavated materials as directed on site.	CM	798		
	TOTAL FOR EXCAVATIONS CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 2 - TENNIS COURT PITCH (All provisional)</u>				
	<u>Sub-Grade</u>				
A	Roll and compact subgrade formation to achieve 98% modified proctors MDD including grading to falls and crossfalls	SM	1,575		
B	Imported and approved murrum backfill materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in layers not exceeding 150mm Thick to Engineer's approval	CM	315		
	<u>Fillings</u>				
C	300mm thick Imported and approved black murrum backfill materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in layers not exceeding 150mm Thick to Engineer's approval	SM	1,575		
	<u>FINISHINGS</u>				
	<u>Natural finish</u>				
D	50mm Thick well compacted fine red murrum on well compacted sub-base; well watered, rolled and compacted to 98% MDD at optimum moisture content to Engineer's approval	SM	1,575		
	<u>Channels</u>				
E	Provide, lay and joint Channel, 125x150mm flush channel block, laid on and including 450x100mm concrete (1:3:6) bed and 100x200mm haunching behind including any necessary formwork and disposal of surplus material as directed.	LM	160		
	TOTAL FOR TENNIS COURT CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<p><u>ELEMENT NO. 3 - WATER DRAINAGE AROUND THE PITCH</u></p> <p><u>FRENCH DRAIN</u></p> <p><u>Oversite Excavation</u> <u>(All excavations Measured Net)</u></p> <p>Excavate for French Drain average depth not exceeding 1500mm Deep, uphold the sides of excavation, keep excavations free from water, trim and compact the bottom of excavation to level and cart away the resultant excavated materials as directed on site as described in:</p>				
A	Main-drain	CM	197		
B	Ditto to Sub-drain	CM	12		
	<p><u>Mass concrete (class 15/20) in;</u></p> <p>50mm Thick Class 15/20 mass concrete blinding to bottom of trenches to receive drain pipe as described in:</p>				
C	Main-drain	SM	131		
	<p><u>Underground Drain Pipe.</u></p> <p>Supply, lay including necessary jointing and connections approved HDPE Perforated Pipe all to approval as described in:</p>				
D	200mm Diameter main drain.	LM	219		
	<p><u>Hesian Filter Fabric</u></p>				
E	Supply and lay approved hesian Filter Fabric to french drains girth 600mm wide.	LM	219		
F	Ditto girth 300mm wide.	LM	74		
	Carried to collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Drain Fillings.</u>				
A	Approved imported hardcore fillings over perforated underground pipe in main drain.	CM	32		
B	Ditto above formation level on subdrains.	CM	7		
C	Supply and place approved 200mm graded aggregates ballast fillings over perforated underground pipe in main drain.	CM	53		
D	Ditto above formation level on subdrains.	CM	4		
E	Supply and place approved sand fillings over perforated underground pipe in main drain.	CM	26		
F	Ditto above formation level on subdrains.	CM	4		
	<u>Inspection chambers</u>				
G	Construct 600 wide x 600 mm long x 1500 mm deep (internal dimensions) storm water manhole, comprising 150 mm thick concrete class 20 bed, 200 mm thick natural stonewalling in cement and sand (1:3) mortar, 150 mm thick concrete class 20 cover slab with requisite reinforcement, 450x 600 mm heavy duty cast iron cover and frame bedded in cement and sand (1:3) mortar; internally plastered & screeded in 15 mm thick lime plaster; 100 mm thick concrete class 20 benching; complete with necessary excavation, formwork and 2 No. connections to pipes not exceeding 200 mm diameter(pipe m/s)	No	7		
	Carried to collection				
	<u>Collection:</u>				
	Brought forward from page TC/3				
	Brought forward from page above				
	TOTAL FOR WATER DRAINAGE AROUND THE PITCH CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT NO. 4 - TERRACES (All provisional)</u>				
	<u>Excavations.</u>				
	(Contractor to allow for carefull upholding of sides of excavations. All measureemnts are net and allow for extra excavations for working space as it will be necessitated by the site conditions).				
	<u>Oversite Excavations.</u>				
A	Excavate oversite average 100mm thick and collect the soil and cart away from site as directed.	SM	902		
	<u>Excavation for foundations.</u>				
A	Excavate for strip foundation starting from reduced level and not exceeding 1.50m deep	CM	470		
B	Ditto exceeding 1.5m deep but not exceeding 3.0m deep.	CM	1		
C	Extra over for excavation in rock.	CM	1		
	<u>Disposal of excavated materials</u>				
D	Return fill and ram selected excavated materials around foundations.	CM	345		
E	Remove excavated materials from site as directed.	CM	127		
	<u>Planking and Water exclusion</u>				
F	Allow for planking and strutting to uphold sides of excavations	Item	1		
G	Ditto but keeping all excavations free from running or underground water by pumping or pailing	Item	1		
	<u>Concrete works</u>				
	<u>Mass concrete (class 15/20) in:</u>				
H	50mm thick blinding under strip footing	SM	470		
	<u>In-situ vibrated reinforced concrete (class 25/25mm) in;</u>				
I	Strip footing	CM	94		
J	Columns	CM	25		
K	Steps	CM	2		
L	Cast insitu coping	Cm	47		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ALL PROVISIONAL</u>				
	<u>Supply and fix steel reinforcement including cutting, bending, hooking, tying and supporting as required</u>				
	<u>High yield tensile square twisted bars to B.S 4461 and K.S 02.22:1976:</u>				
A	Assorted Reinforcement bars of various sizes	KG	14,912		
	<u>Sawn formwork to:</u>				
B	Sides of strip foundation.	SM	314		
C	Sides of columns.	SM	596		
C	Sides and soffits of Coping beams	SM	470		
	<u>Foundation Walling.</u>				
	Approved Load bearing natural stone walling bedded and jointed in cement sand (1:4) mortar including 25mm x 20 gauge hoop iron reinforcement at every alternate course				
D	200mm thick walling	SM	784		
	<u>TERRACE WALLING</u>				
	<u>Selected fine dressed natural stone walling with a minimum of 7.0N/mm2 average compressive strength to B.S. 5390; bedded and jointed in cement and sand mortar (1:4) to approval</u>				
E	200mm thick; reinforced every alternate course with 25mm x 3mm hoop iron wall ties	SM	3,175		
	<u>Precast concrete trimmings finished fair on all exposed faces.</u>				
G	375 x 75mm thick concrete coping reinforced with BS. 4482 BRC mesh.	LM	353		
	<u>Keying Finish to exposed wall surfaces.</u>				
H	Horizontal raking/ keying and flush vertical joints all to approval.	SM	1,568		
	<u>Weep Holes.</u>				
I	Supply and fix 150mm UPVC pipe 250mm long as weep holes across 200mm thick wall with and including all necessary chasing and finish all around them.	NO	1,568		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Fillings</u>				
A	Imported and approved murrum backfill materials as infill to terraces walls, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layers not exceeding 150mm Thick to Engineer's approval	CM	240		
B	Ditto but Pick and use selected excavated materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layer of 150mm Thick to Engineer's approval	CM	240		
	<u>300mm thick ammended planting top soil.</u>				
C	Pick from excavation and use selected excavated vegetable soil and lay to 300mm Thick to be ploughed, disked, graded and chain harrowed for a smooth surface with even falls and a fine tilth for seeding including removal of weeds. Ameliorants (cow manure mixed at 1:2 of top soil) and fertilizer (11:6:9 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) to be mixed into the top soil to receive natural lawn (Pennisetum clandestinum) (m.s)	SM	823		
	<u>FINISHINGS</u>				
	<u>Natural Grass finish</u>				
D	Natural Paspalum Grass (or equivalent) on 150mm deep ammended top soil media (m.s) on 100mm well compacted fine sand (m.s) to receive fertilizer 4:1:3 N:P2O5:K2O applied at a rate of circa 500Kg/ha or approved equal to manufacturer's printed instructions and specifications) 9-12 months after lawn seeding, and annually thereafter to specialist specifications . Contractor to allow for watering and maintenance for six months till fully established.	SM	823		
	<u>Channels</u>				
E	Provide, lay and joint Channel, 125x150mm flush channel block, laid on and including 450x100mm concrete (1:3:6) bed and 100x200mm haunching behind ancluding any necessary formwork and disposal of surplus material as directed.	LM	196		
	<u>Approved plant hedging behind top terrace.</u>				
F	Supply and plant (duranta) approved size plantings to act as hedging behind top terrace with and including watering and maintenance for six months until fully established.	No	1,307		
	Carried to collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	Collection:				
	Brought forward from page TC/5				
	Brought forward from page TC/6				
	Brought forward from page TC/7				
	TOTAL FOR TERRACES CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ELEMENT 5: TENNIS POSTS AND NET</u>				
	<u>Excavation</u>				
A	Excavation for Goal post sockets diameter 150mm wide average depth not exceeding 1500 mm from formed level.	CM	6		
	<u>Load cart away</u>				
B	Load cart away surplus excavated materials to spoil heaps as directed on site.	CM	6		
	<u>In-situ vibrated reinforced concrete (class 25/25mm) in:</u>				
C	Socket - bases & stud columns	CM	3		
	<u>Reinforcement to V.R.C. - High yield tensile square twisted bars to B.S 4461 and K.S 02.22:1976: including bends, hooks and tying wire</u>				
D	Assorted reinforcement bars of various sizes	KG	270		
	<u>Formwork</u>				
E	Sawn formwork with one coat of an approved retarding agent to vertical sides of socket bases	SM	24		
	<u>Mild steel work in:-</u>				
F	Achoring system anchoring in concrete including neoprene caps all as per manufacturer's instructions.	NO	6		
G	150mm Diameter x 4mm thick heavily padded CHS sockets all removable.	LM	6		
	<u>Galvanised steel posts</u>				
I	100mm Diameter x 4mm thick CHS goal post plugged into sockets.	LM	20		
	<u>Mesh NET</u>				
J	20mm steel mesh or white cotton mesh welded to posts all to specialist details and sports regulations.	SM	72		
	TOTAL FOR GOAL POSTS CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>SUMMARY FOR BILL NO. 10 TENNIS COURT</u>				
	<u>ELEMENT</u>				
1	EXCAVATIONS				
2	TENNIS COURT				
3	WATER DRAINAGE AROUND PITCH				
4	TERRACES				
5	GOAL POST & NET				
	TOTAL ESTIMATES FOR BILL NO. 10- TENNIS COURTS CARRIED TO GRAND SUMMARY.				

BILL NO. 11

SWIMMING POOL

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>BILL NO. 11: SWIMMING POOL</u>				
	SPORTS CHANGING ROOMS				
	<u>ELEMET NO. 1 - SUBSTRUCTURE</u>				
	<u>Excavations.</u>				
	(All measureemnts are net and allow for extra excavations for working space as it will be necessitated by the site conditions).				
	<u>Oversite Excavations.</u>				
A	Clear site of all grass, bushes and any undergrowths and cart away all the arising debris.	SM	84		
B	Excavate oversite average 100mm deep starting from existing ground level to remove vegetable soil and cart away.	SM	84		
C	Excavate for Masonry strip foundation starting from reduced level and not exceeding 1.50m deep	CM	68		
D	Excavate for machine room basement commencing from stripped level and not exceeding 1.50m deep	CM	96		
E	Excavate for machine room basement commencing from reduced level and not exceeding 3.0m deep	CM	96		
F	Excavate for Colum Bases starting from reduced level and not exceeding 1.50m deep	CM	7		
G	Extra over for excavation in soft rock.	CM	107		
	<u>Disposal of excavated materials</u>				
H	Return fill and ram selected excavated materials around foundations.	CM	165		
I	Remove excavated materials from site as directed.	CM	10		
	<u>Planking and Water exclusion</u>				
J	Allow for planking and strutting to uphold sides of excavations	Item	1		
K	Ditto but keeping all excavations free from running or underground water by pumping or pailing	Item	1		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>Approved Hardcore</u>				
A	300mm thick approved hardcore compacted and watered in layers of 150mm	CM	84		
B	50mm thick stone dust/murram blinding	SM	84		
	<u>Anti-termite Treatment</u>				
C	Chemical anti-termite treatment as 'Termidor EC 25' to blinded surfaces	SM	84		
	<u>THERMAL AND MOISTURE PROTECTION</u>				
D	500 gauge polythene damp proof membrane under floor bed with 150mm side and ends laps	SM	84		
E	Damp - Poof course B.S 743 , Type A , Bitumen hessian base Horizontal 200 mm wide	LM	76		
	<u>Concrete works</u>				
	<u>Mass concrete 1:4:8 mix as described in:</u>				
F	50mm thick blinding under strip footing	SM	46		
G	Ditto under machine room slab.	SM	64		
H	Ditto under Column Bases	SM	9		
	<u>In-situ vibrated reinforced concrete (class 25/20mm as before described in;</u>				
I	Column Bases	CM	4		
J	Foundation strip footing for masonry walling.	CM	10		
K	Columns	CM	3		
L	150mm Thick floor bed in buildings	SM	42		
M	Floor slab beams	CM	6		
N	200mm thick in machine room basement slab	SM	64		
O	Ditto in machine room retaining wall	SM	96		
P	Ditto in machine room top slab	SM	64		
Q	Thicknessing of Retaining Wall	CM	6		
R	To staircase step	CM	1		
S	150mm thick sloping waist of staircase	SM	7		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>ALL PROVISIONAL</u>				
	<u>Supply and fix steel reinforcement including cutting, bending, hooking, tying and supporting as required</u>				
	<u>High yield tensile square twisted bars to B.S 4461</u>				
A	Assorted Reinforcement bars of various sizes	KG	6,791		
	<u>Mesh fabric reinforcement to B.S 4483 set in concrete with 300mm side and end laps</u>				
B	High yield tensile square twisted bars to B.S 4461	SM	42		
	<u>Sawn formwork to;</u>				
C	Vertical Sides of Column Bases	SM	14		
D	Sides of strip foundation.	SM	15		
E	Ditto Columns	SM	38		
F	Sides and soffits of floor slab beams	SM	58		
G	Soffits of machine room retaining wall	SM	192		
H	Ditto in machine room top slab	SM	64		
I	Ditto slopping soffits of staircase waist	SM	7		
K	Vertical edges of suspendend slab girth 150-225mm high	LM	32		
L	Ditto sloping edges of waist girth 225-300mm including cutting to profile of treads and risers.	LM	14		
M	To vertical edges of risers, girth 150-225mm high	LM	20		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>Foundation Walling.</u>				
	Approved Load bearing natural stone walling bedded and jointed in cement sand (1:4) mortar including 25mm x 20 gauge hoop iron reinforcement at every alternate course				
A	200mm thick walling	SM	57		
	<u>Plinth Finish</u>				
B	15 mm thick to render to plinth surfafes	SM	305		
C	Prepare and apply 3 coats of black bituminous paint to rendered plinth surfaces	SM	305		
	Carried to Collection				
	<u>COLLECTION</u>				
A	Brought forward from page S.S/1				
B	Brought forward from page S.S/2				
C	Brought forward from page S.S/3				
D	Brought forward from page S.S/4				
	TOTAL FOR SUBSTRUCTURES CARRIED TO SUMMARY.				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>ELEMET NO. 2 - CONCRETE SUPERSTRUCTURE</u>				
	<u>In-situ vibrated reinforced concrete (class 25/20mm as before described in;</u>				
A	Ring Beams	CM	11		
B	150mm thick in roof slabs	SM	84		
	<u>ALL PROVISIONAL</u>				
	<u>Supply and fix steel reinforcement including cutting, bending, hooking, tying and supporting as required</u>				
	<u>High yield tensile square twisted bars to B.S 4461</u>				
C	Assorted Reinforcement bars of various sizes	KG	3,112		
	<u>Sawn formwork to;</u>				
D	To soffits and sides of Ring Beams	SM	77		
E	Ditto in roof slabs	SM	84		
F	Ditto 150 - 225mm girth at edges of suspended slab for terraced seating	LM.	76		
	TOTAL FOR CONCRETE SUPERSTRUCTURE CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>ELEMET NO. 3 - WALLING</u>				
	<u>Approved natural stone walling bedded and jointed in cement sand (1:4) mortar reinforced with and including 25mm x 20 gauge hoop iron at every alternate course</u>				
A	200mm thick walling Externally	SM	156		
B	Ditto parapet walling	SM	52		
C	200mm thick walling internally	SM	65		
D	100mm thick Ditto	SM	12		
	<u>Bush Hammered finish</u>				
E	Extra over walling for bush hammered finish to approval	SM	208		
	<u>Precast concrete trimmings finished fair on all exposed faces.</u>				
F	250 x 75mm thick concrete coping reinforced with BS. 4482 BRC mesh.	LM	52		
TOTAL FOR WALLING CARRIED TO SUMMARY					

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>ELEMET NO. 4 - FLAT ROOF FINISHES AND RAINWATER DISPOSAL</u>				
	<u>Water-Proofing To flat roof Slab.</u>				
	<u>Water-proofed Cement and sand (1.4) screed wood floated.</u>				
A	20mm thick laid to levels to receive APP.	SM	106		
B	Ditto in 200mm high skirting.	LM	62		
C	3mm Thick bituminous based APP Membraneor similar approved laid on and including primer with torch - on - process with 10 year guarantee installed in accordance with Manufacture's instructions to the satisfaction of the Architect with 150mm side and end laps (measured nett - allow for laps).	SM	106		
D	Ditto 200mm high turned into and nclusive of chasing of the groove in concrete and masonry surfaces and creating fillet water proof junction at buttom of skirting.	LM	62		
E	Extra over APP membrane for fulbore outlet treatment.	NO	20		
	<u>Concrete Interlocking Tiles.</u>				
F	Supply and fix 12mm thick interlocking tiles.	SM	106		
G	200mm high in 15mm thick Cement sand render on top of the APP skirting above.	LM	62		
H	150mm diameter UPVC Fulbora grating to approval including chasing outlet for it and making good.	NO	20		
I	150 mm diameter heavy duty UPVC rainwater down pipe fixed with clips at centres not exceeding 1200mm.	LM	12		
J	Extra over for rain water shoe	No.	4		
	<u>Painting and Decorating</u>				
K	Prepare and apply three coats gross oil paint to metal surfaces girth 150-225mm wide.	LM	12		
	TOTAL FOR ROOFING WORKS AND RAIN WATER DISPOSAL CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>ELEMET NO. 5 - DOORS</u>				
	<u>DOOR LINTELS</u>				
A	Supply and fix 200mm x 350mm Reinforced precast door lintols	LM	22		
	<u>Mild Steel louvered door</u>				
B	Mild Steel louvered double door overall size 1200 x 2100mm high in 2 no. equal door leaf, comprising of , 50X75x4mm R.H.S main frame fish tailed and anchored to concrete, 75X75x4 mm S.H.S in stiles and rails all round, 100x75x4mm R.H.S middle rail frame to door leaf, 4 mm steel louveres painted hammerite at 45Degree with mosquito screen on back complete with fixing lugs, pairs butt hinges hasps for padlock to Architect detail.	NO	1		
	<u>45mm thick post formed solid core flush door faced both sides with 4mm thick hardwood imported Veneer, 45X20 mm hard wood lipping 10mm all round wide routed groved pattern on both side all as per Architects drawings</u>				
C	Door size 800 x 1900mm high	NO	16		
D	Door size 800 x 1850mm high	NO	4		
	<u>All in wrot Hardwood</u>				
E	150 x 50mm Door frame rebated including screwing to concrete/walls	LM	120		
F	25 x 25mm splayed architrave	LM	120		
G	20mm Quadrant beading	LM	163		
H	Plastic weathering apron around glass edges	LM	43		
	<u>Ironmongery</u>				
	<u>Supply and Fix the following ironmongery : Locks and furniture where applicable are to be equal to those manufactured by UNION and approved by the Architect</u>				
I	100 x 76 x 3 mm Stainless steel butt hinges with screws.	PRS	40		
J	2 lever Mortice Door lock with furniture.	No	20		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	Stainless - PUSH- Plate 150 x 600 mm	NO	40		
B	Stainless steel Coat and Hat Hook rubber Tip.	PRS	20		
C	Stainless Steel Male / Female / Disabled sign.	NO	20		
D	Indicator Bolt - Vacant / Engaged.	No	22		
E	Door Stop Oval satin Nickle - Floor Mounted .	NO	20		
F	Door Handle	NO	40		
	<u>Painting and Decorating</u>				
	Knot, stop,prepare and apply one undercoat and two finishing coats of polyurethane varnish to CROWN Paints first quality or other equal and approval to:				
G	General timber surfaces	SM	40		
H	Ditto to frames 0-100mm	LM	120		
I	Ditto to frames 100-200mm	LM	120		
	Carried to Collection				
	COLLECTION				
	Brought Down from Page 8				
	Brought Down from Page 9				
	TOTAL FOR DOORS CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>ELEMET NO. 6 - WINDOWS</u>				
	<u>Curtain rail</u>				
A	40mm diameter brass coated mild stell bar on brackets with 40 mm diameter curtain rings and decorative ends.	LM	12		
	<u>Window Cill</u>				
B	Pre-cast concrete window cill 250mm x 75mm thick well throated; fixed in cement mortar to top of wall as window cill.	LM	12		
	<u>Hard wood window board all round window reveal & jamps</u>				
C	150X25 mm hardwood	LM	30		
	<u>SUPPLY AND FIX the following powder coated aluminium windows comprising 100 x 50mm aluminium top rail, bottom rail, mullions, frames where applicable complete with aluminium glazing beads as specified in Architect's drawings,6 mm thick frosted glass with a 50 mm Air gap at the top level</u>				
	<u>Fixing with aluminium screws , plugging , sealing with mastic , oiling and adjusting on complection including soft wood packing where necessary</u>				
D	Overall Size 3000 x 600 mm high.	NO	4		
	TOTAL FOR WINDOWS CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>ELEMET NO. 9 - FINISHES</u>				
	<u>FLOOR</u>				
	<u>BACKGROUND Mortar: Cement and sand (1.4) wood floated.</u>				
A	30mm thick to receive ceramic tiles	SM	148		
	<u>Supply and Fix 10mm thick ceramic floor tiles</u>				
B	In screeded floor beds.	SM	148		
	<u>WALL FINISH</u>				
	<u>EXTERNAL WALL FINISH</u>				
	<u>CEMENT AND WASHED SAND (1:4) RENDER WOOD floated</u>				
C	Plaster work	SM	52		
	<u>PAINTING AND DECORATION</u>				
	<u>PREPARE AND APPLY THREE COATS first grade weathered emulsion paint :on</u>				
D	Pastered wall surfaces externall	SM	52		
	<u>INTERNAL WALL FINISHES</u>				
	<u>INTERNAL LIME PLASTER first coat of cement and sand (1:2:9) second coat of cement , lime putty and sand (1:1:6) steel trowelled smooth</u>				
E	12mm thick to masonry surfaces Internally	SM	486		
	<u>PAINTING AND DECORATIONS</u>				
	<u>PREPARE AND APPLY THREE COATS first grade waeathered emulsion paint :on</u>				
F	Steel trowelled Plastered masonry surfaces	SM	486		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>CEILING FINISHES</u>				
	<u>INTERNAL LIME PLASTER first coat of cement and sand (1:2:9) second coat of cement , lime putty and sand (1:1:6) steel trowelled smooth</u>				
A	Ditto to Sides and soffits of beams	SM	77		
B	Ditto to roof slabs	SM	84		
	<u>PAINTING AND DECORATIONS</u>				
	<u>PREPARE AND APPLY THREE COATS first grade waeathered emulsion paint :on</u>				
C	Ditto to Sides and soffits of beams	SM	129		
D	Ditto to roof slabs	SM	155		
	Carried to collection				
	<u>COLLECTION PAGE</u>				
	Brought forward from page S.S 11				
	Brought forward from page S.S 12				
	TOTAL FOR FINISHES CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>ELEMET NO. 09 - JOINERY WORKS (BENCHES & CHANGING LOCKERS)</u>				
	BENCHES				
	Fabricate and changing rooms 450mm wide top seating by 450mm high benches. Benches to be made of 40x25x3mm RHS as the main structure all in top members running parallel at 450mm and top cross members at centres not more than 1200mm. H-Shaped supporting stands at centres not more that 1200mm and a running cross member welded to connect and support the stands all welded and polished to approval. The 450mm wide top seat to be of approved mvule timber battens of 75x25 spaced at equidistant interval not exceeding 25mm of sizes overall. The entire benches to be done to project manager satisfaction and as per Architect's drawings. Benches given in overall length but to be done in assorted lengths to fit in rooms as per Architect's details.				
A	2400 mm long in Changing Rooms	No	2		
	<u>CHANGING LOCKERS</u>				
B	Supply and Install Mild Steel Changing Lockers overall size 1600mm x 2000mm High, with 10 number lockable compartments in 2 rows all to approval.	No	2		
	TOTAL FOR FITTINGS & FIXTURES CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<p><u>ELEMET NO. 10 - BULIDERS WORK IN CONNECTION WITH SPECIALIST SERVICES</u></p> <p><u>(ALL PROVISIONAL)</u></p> <p>NOTE: The allowance for Plumbing and Electrical installations is including in Prime Cost and Provisional Sums under P.C. Sums and only builders work is measured under this Element</p> <p><u>BULIDERS WORK IN CONNECTION WITH PLUMBING INSTALLATION</u></p> <p>Cut away for and make good after Plumber installing concealed pipe system to the following items including cutting or leaving all holes, notches, mortises, sinking, chases, both in the structure and its finishes and for all making good in connection therewith.</p>				
A	Cut horizontal or vertical chase in masonry work for small pipe and make good	LM.	20		
B	Make or leave hole for 200mm thick masonry in small pipe and make good	NO.	20		
C	Ditto <u>but</u> for large pipe	NO.	10		
	TOTAL CARRIED TO COLLECTION				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<p><u>BUILDERS WORK IN CONNECTION WITH ELECTRICAL INSTALLATION.</u></p> <p>Cut away for and make good after Electrical installing concealed pipe system to the following items including cutting or leaving all holes, notches, mortises, sinking, chases, both in the structure and its finishes and for all making good in connection therewith.</p>				
A	Lighting points and associated switch points	NO.	10		
B	External securely fittings and associated switch points	NO	10		
C	13AMP socket outlet points with associated switch points	NO.	8		
D	Consumer unit	NO.	2		
E	Distribution board and meter board etc.	NO.	8		
F	Fire alarm points	NO.	4		
G	Data outlet point	NO.	4		
	TOTAL CARRIED TO COLLECTION				
	<u>COLLECTION</u>				
	Brought from page S.S 14				
	Brought from S.S 15				
	TOTALFOR BUILDERS WORK IN CONNECTION WITH SPECIALIST SERVICES CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>BUILDERS WORK SUMMARY</u>				
	<u>ELEMENTS</u>				
1	Substructures				
2	Concrete superstructure.				
3	Walling				
5	Roofing and Rain Water Disposal.				
7	Doors				
8	Windows				
9	Finishes				
10	Joinery Fittings				
11	Builders Work in Connection with Specialist Services				
	TOTAL AMOUNT FOR BUILDER'S WORKS FOR CHANGING ROOMS CARRIED TO SUMMARY.				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>SWIMMING POOL DECK</u>				
	<u>Excavations.</u> (All measurements are net and allow for extra excavations for working space as it will be necessitated by the site conditions).				
	<u>Oversite Excavations.</u>				
A	Clear site of all grass, bushes and any undergrowths and cart away all the arising debris.	SM	626		
B	Excavate oversite average 100mm deep starting from existing ground level to remove vegetable soil and cart away.	SM	626		
	<u>Excavation to reduce levels.</u>				
C	Mass excavation to reduce levels to formation from stripped level to n.e 1.5m deep. Load and cart away debris as directed on site.	CM	188		
	<u>Kerb</u>				
D	Provide, lay and joint Channel, 125x150mm flush channel block, laid on and including 450x100mm concrete (1:3:6) bed and 100x200mm haunching behind including any necessary formwork and disposal of surplus material as directed.	LM	144		
	<u>Anti-termite Treatment</u>				
E	Chemical anti-termite treatment as 'Termidor EC 25' to blinded surfaces	SM	626		
	<u>Disposal of excavated materials</u>				
F	Return fill and ram selected excavated materials around foundations.	CM	93		
G	Remove excavated materials from site as directed.	CM	95		
	<u>Planking and Water exclusion</u>				
H	Allow for planking and strutting to uphold sides of excavations	Item	1		
I	Ditto but keeping all excavations free from running or underground water by pumping or pailing	Item	1		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<u>Approved Hardcore</u> Use selected excavated materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layer of 200mm Thick to Engineer's approval	CM	188		
B	<u>Approved stone dust/murram blinding.</u> 50mm thick stone dust/murram blinding	SM	626		
B	<u>Anti-termite Treatment</u> Chemical anti-termite treatment as 'Termidor EC 25' to blinded surfaces	SM	626		
C	<u>Concrete works</u> <u>In-situ vibrated reinforced concrete (class 25/20mm as before described in;</u> 75mm Thick floor bed in buildings	SM	626		
D	<u>Mesh fabric reinforcement to B.S 4483 set in concrete with 300mm side and end laps</u> High yield tensile square twisted bars to B.S 4461	SM	626		
E	<u>Sawn formwork to;</u> Edges of floor bed 75 - 150mm grith.	LM	140		
F	<u>FINISHES</u> <u>BACKGROUND Mortar: Cement and sand (1.4) wood floated.</u> 30mm thick to receive clay tiles in floor	SM	626		
G	15mm thick ditto in skirting 100mm high to receive tile skirting	LM	305		
H	<u>Supply and Fix 10mm thick clay floor tiles</u> In screeded floor beds.	SM	626		
	Carried to Collection				
	<u>COLLECTION.</u> Brought down from page S.S 17 Brought down from page S.S 18				
	TOTAL FOR SWIMMING POOL DECK CARRIED TO SUMMARY.				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>SWIMMING POOL</u>				
	<u>Excavations.</u> (All measureemnts are net and allow for extra excavations for working space as it will be necessitated by the site conditions).				
	<u>Oversite Excavations.</u>				
A	Clear site of all grass, bushes and any undergrowths and cart away all the arising debris.	SM	477		
B	Excavate oversite average 100mm thick and collect the soil and cart away from site as directed.	SM	477		
	<u>Excavation to reduce levels.</u>				
A	Mass excavation to reduce levels to formation from existing ground level n.e 1.5m deep. Load and cart away debries as per structural Engineers instructions inclusive necessary watering and planking .	CM	716		
B	Ditto exceeding 1.5m deep but n.e 3.0m deep ditto	CM	382		
E	Extra over for excavation in soft rock.	CM	38		
F	Allow for trimming and levelling the bottom of excavation to receive concrete blinding.	SM	477		
	<u>Anti-termite Treatment</u>				
G	Chemical anti-termite treatment as 'Termidor EC 25' to blinded surfaces	SM	477		
	<u>Disposal of excavated materials</u>				
H	Return fill and ram selected excavated materials around foundations.	CM	93		
I	Remove excavated materials from site as directed.	CM	1,005		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>Planking and Water exclusion</u>				
A	Allow for planking and strutting to uphold sides of excavations	Item	1		
B	Ditto but keeping all excavations free from running or underground water by pumping or pailing	Item	1		
	<u>Concrete Works.</u>				
	<u>Mass concrete 1:4:8 mix as described in;</u>				
C	50mm thick blinding on bed.	SM	477		
	<u>In-situ vibrated reinforced concrete (class 25/20mm as before described in;</u>				
D	200mm thick in Floor bed.	SM	477		
E	Ditto in vertical walls.	SM	178		
F	Ditto in Sump.	SM	2		
G	In retaining wall thickening	CM	10		
	<u>ALL PROVISIONAL</u>				
	<u>Supply and fix steel reinforcement including cutting, bending, hooking, tying and supporting as required</u>				
	<u>High yield tensile square twisted bars to B.S 4461</u>				
G	Assorted Reinforcement bars of various sizes	KG	12,726		
	<u>Sawn formwork to;</u>				
H	Sides of Concrete walls.	SM	356		
I	Sides of Sump and drainage Channel walls.	SM	2		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	Extra over for forming rebates for angle line in channels and in openable sump cover slab. <u>Water-Proofing.</u>	LM	90		
B	Render the reinforced concrete wall and floor with SIKA - 1 additive to Structural Engineer's approvals. <u>FINISHES</u> <u>BACKGROUND Mortar: Cement and sand (1.4) wood floated.</u>	SM	657		
E	25mm thick to receive ceramic tiles in floor and wall surfaces. <u>Supply and Fix 8mm thick ceramic floor tiles</u>	SM	657		
F	In screeded floor beds.	SM	657		
Carried to Collection					
<u>COLLECTION.</u> Brought down from page S.S 20 Brought down from page S.S 21 Brought down from page S.S 22					
TOTAL FOR SWIMMING POOL CARRIED TO SUMMARY.					

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>SWIMMING POOL TERRACED SEATINGS</u>				
	<u>ELEMENT NO. 01</u>				
	<u>Excavations.</u>				
	(All measureemnts are net and allow for extra excavations for working space as it will be necessitated by the site conditions).				
A	Excavate for Column bases starting from stripped level and not exceeding 1.50m deep	CM	32		
B	Ditto exceeding 1.5m deep but not exceeding 3.0m deep.	CM	6		
C	Extra over for excavation in rock.	CM	8		
	<u>Disposal of excavated materials</u>				
D	Return fill and ram selected excavated materials around foundations.	CM	33		
E	Remove excavated materials from site as directed.	CM	12		
	<u>Planking and Water exclusion</u>				
F	Allow for planking and strutting to uphold sides of excavations	Item	1		
G	Ditto but keeping all excavations free from running or underground water by pumping or pailing	Item	1		
	<u>Concrete works</u>				
	<u>Mass concrete 1:4:8 mix as described in;</u>				
H	50mm thick under column bases	SM	21		
	<u>In-situ vibrated reinforced concrete (class 25/20mm as before described in;</u>				
I	Column bases	CM	8		
J	Columns in foundations.	CM	4		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>ALL PROVISIONAL</u>				
	<u>Supply and fix steel reinforcement including cutting, bending, hooking, tying and supporting as required</u>				
	<u>High yield tensile square twisted bars to B.S 4461</u>				
A	Assorted Reinforcement bars of various sizes	KG	1,688		
	<u>Sawn formwork to;</u>				
B	Sides of column bases.	SM	42		
C	Sides of columns.	SM	50		
	Carried to Collection				
	<u>COLLECTION</u>				
A	Brought forward from page S.S/23				
B	Brought forward from page S.S/24				
	TOTAL FOR SUBSTRUCTURES CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>CONCRETE SUPERSTRUCTURE</u>				
	<u>In-situ vibrated reinforced concrete (class 25/20mm as before described in;</u>				
A	Columns	CM	6		
B	Ditto terraced seatings support beams	CM	18		
C	200mm thick suspended slab for terraced seatings	SM	195		
D	Seating terrace Steps	CM	9		
	<u>ALL PROVISIONAL</u>				
	<u>Supply and fix steel reinforcement including cutting, bending, hooking, tying and supporting as required</u>				
	<u>High yield tensile square twisted bars to B.S 4461</u>				
E	Assorted Reinforcement bars of various sizes	KG	7,149		
	<u>Sawn formwork to;</u>				
F	Sides of columns.	SM	76		
G	Ditto terraced seatings support beams	SM	158		
H	To soffits of suspended slab for terraced seatings	SM	195		
I	To edges of steps/risers	SM	75		
J	Ditto 150 - 225mm girth at edges of suspended slab for terraced seating	LM.	120		
	TOTAL FOR CONCRETE SUPERSTRUCTURE CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p><u>FINISHES.</u></p> <p><u>Cement wash finish on all concrete surfaces</u></p> <p>Prepare cement wash and apply on all concrete surfaces to approval.</p>	SM	735		
	Total Carried To Collection				
A	Substructures				
B	Concrete Superstructure				
C	Finishes and Balustrades				
	TOTAL FOR SWIMMING POOL TERRACED SEATINGS CARRIED TO SUMMARY FOR THIS BILL				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
<u>SCREEN BOUNDARY WALL & ROOF COVER OVER BEHIND SWIMMING POOL TERRACES.</u>					
A	Excavate trench for masonry strip foundation not exceeding 1.5metrs deep from existing ground level.	CM	19		
B	Ditto to the column bases	CM	15		
C	Extra over excavation for excavating in soft rock.	CM	7		
D	Return fill and ram excavated materials around foundation walls.	CM	22		
E	Cart away surplus excavated materials as directed on.	CM	12		
<u>Sundries</u>					
F	Allow for keeping excavations free of water	Item	1		
G	Allow for plunking and strutting sides of excavation	Item	1		
<u>Mass Concrete (1:4:8)in:-</u>					
H	50mm Thick under strip foundation.	SM	60		
I	50mm Thick under Column bases .	SM	100		
<u>Concrete (1:2:4) in :-</u>					
J	Strip foundation.	CM	4		
K	Ditto Column bases	CM	5		
L	Ditto Columns	CM	4		
<u>Steel reinforcement.</u>					
M	Assorted reinforcement bars.	KG	1075		
<u>Sawn formwork to:-</u>					
N	Sides of strip foundation.	SM	12		
O	Ditto Column bases	SM	18		
P	Ditto Columns	SM	60		
Total carried to collection					

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>Load bearing natural stone walling bedded and jointed in cement sand (1:4) mortar including 25mm x 20 gauge hoop iron reinforcement at every alternate course</u>				
A	200mm thick walling	SM	32		
	<u>Machine cut natural stone walling bedded and jointed in cement sand (1:4) mortar including 25mm x 20 gauge hoop iron reinforcement at every alternate course</u>				
B	200mm thick walling	SM	16		
	<u>Bush Hammer finish</u>				
C	Extra over walling for bush hammerd finish to approval	SM	32		
	<u>Expansion Joint.</u>				
D	15mm Thick styropor or other equal and approved flexible material set in 250mm thick retaining wall and 200mm boundary walling.	LM.	12		
E	Labour and materials in pointing the expansion joint in water proofing materials to Architect approval.	LM.	24		
	<u>Sundries</u>				
	<u>Precast concrete trimmings finished fair on all exposed faces.</u>				
F	250 x 75mm thick concrete coping reinforced with BS. 4482 BRC mesh.	LM	32		
G	Ditto but 450 x 450 x 75 mm coping to columns	NO	15		
	<u>CEMENT AND WASHED SAND (1:4) RENDER WOOD floated</u>				
H	Plaster work to concrete surfaces	SM	60		
	Total carried to collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>PREPARE AND APPLY THREE COATS first grade waeathered emulsion paint .on</u>				
A	Pastered wall surfaces external	SM	60		
	<u>ROOFING WORKS AND RAIN WATER DISPOSAL</u>				
	<u>Covering</u>				
B	Prepainted G.I Gauge 24 box profie roofing sheets laid with 150mm side and end laps fixed to steel purlins (m/s) with and including J bolts with hexagonal nuts and PVC washer tropicelized caps and drilling holes for nolths through sheeting all factory curved in radius to detail	SM	288		
	<u>The following in structural mild steel framework to B.S 449, all prepainted with ant-rust primer before fixing raised to a height not exceeding 10m above ground level all as per Engineer's details, all welds to be ground and polished smooth all to approval.</u>				
C	50mm internal diameter x 3mm thick CHS in trusses.	KGS	1,440		
D	50 x50mm x 3mm Thick SHS.	KGS	900		
E	Ditto bent and curved to roof profile	KGS	1,530		
F	Zed Purlins 100 x 50mm x 2 mm Thick with and including connection to trusses all to approval	LM	192		
	<u>Fascia board</u>				
G	500 x 5mm Thick mild steel sheet in Fascia/verge board with and incuding 25 x 25 x 1.2mm thick steel support framework.	LM	64		
	<u>Sundries.</u>				
H	150mmx150mmx10mm thick base pate with 4 no bolt holes.	NO	20		
	Total carried to collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>Sundries Cont'd</u>				
A	Allow for drilling holes into concrete surfaces and morticing 10mm diameter 150mm long bolt into into it, bolting it to either angle line or base plate and making good on all disturbed areas.	NO	80		
B	150mm long by 10mm diameter bolt.	NO	320		
	<u>Prime stop and apply one undercoat and two finishing coats of gloss paint to CROWN PAINTS first quality or other equal and approved to metal surfaces of:</u>				
C	To metal surfaces of fascia board.	LM	128		
	Total carried to collection				
	<u>COLLECTION</u>				
	Brought down from page S.S /26				
	Brought down from page S.S /27				
	Brought down from page S.S /28				
	Brought down from page S.S/29				
	TOTAL FOR SCREEN BOUNDARY WALL & ROOF COVER OVER BEHIND SWIMMING POOL TERRACES CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>BOUNDARY WALL & STEEL GRILES FENCING AROUND SWIMMING POOL</u>				
A	Excavate trench for masonry strip foundation not exceeding 1.5metrs deep from existing ground level.	CM	58		
C	Ditto to the column bases	CM	39		
F	Extra over excavation for excavating in rocks of all kind.	CM	19		
E	Return fill and ram excavated materials around foundation walls.	CM	85		
D	Cart away surplus excavated materials as directed on.	CM	18		
	<u>Sundries</u>				
G	Allow for keeping excavations free of water	Item	1		
H	Allow for plunking and strutting sides of excavation	Item	1		
	<u>Mass Concrete (1:4:8)in:-</u>				
I	50mm Thick under strip foundation.	SM	60		
K	50mm Thick under Column bases .	SM	100		
	<u>Concrete (1:2:4) in :-</u>				
L	Strip foundation.	CM	12		
O	Ditto Column bases	CM	12		
P	Ditto Columns	CM	9		
A	<u>Steel reinforcement.</u>				
B	Assorted reinforcement bars.	KG	2975		
	<u>Sawn formwork to:-</u>				
C	Sides of strip foundation.	SM	40		
F	Ditto Column bases	SM	47		
G	Ditto Columns	SM	156		
	Total carried to collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>Load bearing natural stone walling bedded and jointed in cement sand (1:4) mortar including 25mm x 20 gauge hoop iron reinforcement at every alternate course</u>				
A	200mm thick walling	SM	39		
	<u>Machine cut natural stone walling bedded and jointed in cement sand (1:4) mortar including 25mm x 20 gauge hoop iron reinforcement at every alternate course</u>				
B	200mm thick walling	SM	49		
	<u>Bush Hammer finish</u>				
C	Extra over walling for bush hammerd finish to approval	SM	97		
	<u>Expansion Joint.</u>				
D	15mm Thick styropor or other equal and approved flexible material set in 250mm thick retaining wall and 200mm boundary walling.	LM.	40		
E	Labour and materials in pointing the expansion joint in water proofing materials to Architect approval.	LM.	80		
	<u>Sundries</u>				
	<u>Precast concrete trimmings finished fair on all exposed faces.</u>				
F	250 x 75mm thick concrete coping reinforced with BS. 4482 BRC mesh.	LM	97		
G	Ditto but 450 x 450 x 75 mm coping to columns	NO	39		
	<u>CEMENT AND WASHED SAND (1:4) RENDER WOOD floated</u>				
H	Plaster work to concrete surfaces	SM	156		
	Total carried to collection				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
I	<p><u>PREPARE AND APPLY THREE COATS first grade waeathered emulsion paint .on</u></p> <p>Pastered wall surfaces external</p>	SM	156		
J	<p><u>Mild Steel Fencing grilles</u></p> <p>25x25x2mm thick SHS in vertical members at 225mm centres and bottom, middle and top horizontal rails members. Allow for fish tailing with lags, chasing and morticing both ends of horizontal into concrete with and including making good to approval. Supply and apply approved gloss paint to metal grilles.</p>				
	Overall Size 2500mmx1800mm high.	NO	39		
	Total carried to collection				
	<p><u>COLLECTION</u></p> <p>Brought down from page S.S /29</p> <p>Brought down from page S.S /30</p> <p>Brought down from page S.S/32</p>				
	TOTAL FOR BOUNDARY WALL & STEEL GRILES FENCING AROUND SWIMMING POOL CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>PROVISIONAL & PRIME COST SUMS</u>				
	<u>PRIME COST SUMS</u>				
A	Provide a sum of KENYA SHILLINGS (.....) only for incoming power reticulation to be executed complete by a nominated subcontractor.				<i>Priced in respective volumes</i>
B	Allow for profit				<i>To be included in rates for these works</i>
C	Allow for attendance				<i>To be included in rates for these works</i>
D	Provide a sum of KENYA SHILLINGS (.....) only sanitary fittings to be executed complete by a nominated subcontractor.				<i>Priced in respective volumes</i>
E	Allow for profit				<i>To be included in rates for these works</i>
F	Allow for attendance				<i>To be included in rates for these works</i>
G	Provide a sum of KENYA SHILLINGS (.....) only PPR Pipework (Internal Plumbing) to be executed complete by a nominated subcontractor.				<i>Priced in respective volumes</i>
H	Allow for profit				<i>To be included in rates for these works</i>
I	Allow for attendance				<i>To be included in rates for these works</i>
	Carried To Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
A	Provide a sum of KENYA SHILLINGS(.....) only for foul water internal drainage UPVC Pipework to be executed complete by a approved domestic subcontractor.	<i>Priced in respective volumes</i>				
B	Allow for profit	<i>To be included in rates for these works</i>				
C	Allow for attendance	<i>To be included in rates for these works</i>				
D	Provide a sum of KENYA SHILLINGS (.....) only fire fighting (Portable fire extinguishers) to be executed complete by a approved domestic subcontractor.	<i>Priced in respective volumes</i>				
E	Allow for profit	<i>To be included in rates for these works</i>				
F	Allow for attendance	<i>To be included in rates for these works</i>				
G	Provide a sum of KENYA SHILLINGS (.....) only for Electrical Power Distribution to be executed complete by a approved domestic subcontractor.	<i>Priced in respective volumes</i>				
H	Allow for profit	<i>To be included in rates for these works</i>				
I	Allow for attendance	<i>To be included in rates for these works</i>				
J	Provide a sum of KENYA SHILLINGS (.....) only for lighting and power outlets to be executed complete by a approved domestic subcontractor.	<i>Priced in respective volumes</i>				
K	Allow for profit	<i>To be included in rates for these works</i>				
L	Allow for attendance	<i>To be included in rates for these works</i>				
M	Provide a sum of KENYA SHILLINGS (.....) only for Swimming pool equipments to be executed complete by a approved domestic subcontractor.	<i>Priced in respective volumes</i>				
N	Allow for profit	<i>To be included in rates for these works</i>				
O	Allow for attendance	<i>To be included in rates for these works</i>				
Carried To Collection						

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	Provide a sum of KENYA SHILLINGS (.....) only for Solar Hot Water System to be executed complete by a approved domestic subcontractor.				
				<i>Priced in respective volumes</i>	
B	Allow for profit				
C	Allow for attendance				
				<i>To be included in rates for these works</i>	
				<i>To be included in rates for these works</i>	
	<u>PROVISIONAL SUMS</u>				
D	Provide a sum of KENYA SHILLINGS FORTY ONE THOUSAND, SIX HUNDRED (41,600.00) only roof tanks (Break tanks)				41,600.0
E	Provide a sum of KENYA SHILLINGS ONE MILLION (1,000,000.00) only for foul water external drainage in manholes and pipeworks.	SUM			1,000,000.0
F	Provide a sum of KENYA SHILLINGS FIVE HUNDRED THOUSAND (500,000.00) only for storm water external drainage in mangoles and pipeworks.	SUM			500,000.0
	Carried To Collection				
	COLLECTION				
	Brought From page S.S/33				
	Brought From page S.S/34				
	Brought From page above				
	TOTAL FOR PC & PS CARRIED TO COLLECTION				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>SUMMARY.</u>				
A	CHANGING ROOMS & MACHINE ROOM				
B	SWIMMING POOL DECK				
C	SWIMMING POOL				
D	SWIMMING POOL TERRACED SEATING				
E	SCREEN BOUNDARY WALL & ROOF COVER OVER BEHIND SWIMMING POOL TERRACES.				
F	BOUNDARY WALL & STEEL GRILES FENCING AROUND SWIMMING POOL				
G	PRIME COST AND PROVISIONAL SUMS				
	TOTAL FOR SWIMMING POOL & ITS SUPPORT FACILITIES CARRIED TO MAIN SUMMARY				

BILL NO. 12

WASHROOMS

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>BILL NO. 12 : STAND ALONE WASHROOMS BLOCKS</u>				
	<u>SUBSTRUCTURE</u>				
	<u>Excavations.</u>				
	(Contractor to allow for carefull upholding of sides of excavations. All measureemnts are net and allow for extra excavations for working space as it will be necessitated by the site conditions).				
	<u>Oversite Excavations.</u>				
A	Excavate oversite average 100mm deep starting from existing ground level to remove vegetable soil and cart away.	SM	54		
B	Excavate to remove black cotton soil and collect the soil and cart away from site as directed.	CM	16		
	<u>Excavation for foundations.</u>				
C	Excavate for Masonry strip foundation starting from reduced level and not exceeding 1.50m deep	CM	25		
D	Extra over for excavation in soft rock.	CM	1		
	<u>Disposal of excavated materials</u>				
E	Return fill and ram selected excavated materials around foundations.	CM	10		
F	Remove excavated materials from site as directed.	CM	15		
	<u>Planking and Water exclusion</u>				
G	Allow for planking and strutting to uphold sides of excavations	Item	1		
H	Ditto but keeping all excavations free from running or underground water by pumping or pailing	Item	1		
	<u>Approved Hardcore</u>				
I	Approved hardcore compacted and watered in layers of 150mm	CM	27		
J	50mm thick stone dust/murram blinding	SM	54		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Anti-termite Treatment</u>				
A	Chemical anti-termite treatment as 'Termidor EC 25' to blinded surfaces	SM	54		
	<u>THERMAL AND MOISTURE PROTECTION</u>				
B	100 gauge polythene damp proof membrane under floor bed with 200mm side and ends laps	SM	54		
C	Damp - Poof course B.S 743 , Type A , Bitumen hessian base Horizontal 200 mm wide	LM	43		
	<u>Concrete works</u>				
	<u>Mass concrete (class 15/20) in;</u>				
D	50mm thick blinding under strip footing	SM	26		
	<u>In-situ vibrated reinforced concrete (class 25/25mm) in;</u>				
E	Foundation strip footing for masonry walling.	CM	5		
F	100mm Thick floor bed.	SM	54		
	<u>ALL PROVISIONAL</u>				
	<u>Supply and fix steel reinforcement including cutting, bending, hooking, tying and supporting as required</u>				
	<u>High yield tensile square twisted bars to B.S 4461 and K.S 02.22:1976:</u>				
G	Assorted Reinforcement bars of various sizes	KG	450		
	<u>BRC A142 Mesh fabric reinforcement to B.S 4483 set in concrete with 300mm side and end laps</u>				
H	High yield tensile square twisted bars to B.S 4461	SM	54		
	<u>Sawn formwork to;</u>				
I	Sides of strip foundation.	SM	17		
J	Edges of floor bed 75 - 150mm grith.	LM	34		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Foundation Walling.</u>				
	Approved Load bearing natural quarry stone walling bedded and jointed in cement sand (1:4) mortar including 25mm x 20 gauge hoop iron reinforcement at every alternate course				
A	200mm thick walling	SM	52		
	Carried to Collection				
	<u>COLLECTION</u>				
A	Brought forward from page WS/1				
B	Brought forward from page WS/2				
C	Brought forward from page above				
	TOTAL FOR SUBSTRUCTURES CARRIED TO SUMMARY.				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>CONCRETE SUPERSTRUCTURE</u>				
	<u>In-situ vibrated reinforced concrete (class 25/25mm) in;</u>				
A	Ring Beams	CM	2		
	<u>ALL PROVISIONAL</u>				
	<u>Supply and fix steel reinforcement including cutting, bending, hooking, tying and supporting as required</u>				
	<u>High yield tensile square twisted bars to B.S 4461 and K.S 02.22:1976:</u>				
B	Assorted Reinforcement bars of various sizes	KG	180		
	<u>Sawn formwork to:</u>				
C	Sides and soffits of horizontal beams	SM	26		
	TOTAL FOR CONCRETE SUPERSTRUCTURE CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>WALLING</u>				
	<u>Approved natural stone walling bedded and jointed in cement sand (1:4) mortar reinforced with and including 25mm x 20 gauge hoop iron at every alternate course</u>				
A	200mm thick walling Externally	SM	134		
B	Ditto internally	SM	27		
	<u>Precast concrete trimmings finished fair on all exposed faces.</u>				
C	250 x 75mm thick concrete coping reinforced with BS. 4482 BRC mesh.	LM	10		
D	Circular fair rake cutting on 200mm thick wall	LM	18		
	<u>MDF PARTITIONS IN WASHROOM CUBICLES</u>				
E	The following in 18mm thick mdf solid grade laminate partitions including all necessary 50 x50 mm thick harwood framing and studwork, quadrants, architraves and paintining all to approval.	Sm	35		
	TOTAL FOR WALLING CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>ROOFING WORKS AND RAIN WATER DISPOSAL</u>				
	<u>Covering</u>				
A	Prepainted G.I Gauge 24 box profile roofing sheets laid with 150mm side and end laps fixed to steel purlins (m/s) with and including J bolts with hexagonal nuts and PVC washer tropicelized caps and drilling holes for noths through sheeting all factory curved in radius to detail	SM	72		
	<u>The following in structural mild steel framework to B.S 449, all prepainted with ant-rust primer before fixing raised to a height not exceeding 10m above ground level all as per Engineer's details, all welds to be ground and polished smooth all to approval.</u>				
B	50mm internal diameter x 3mm thick CHS in trusses.	KGS	27		
C	50 x50mm x 3mm Thick SHS.	KGS	594		
D	Ditto bent and curved to roof profile	KGS	162		
E	Zed Purlins 100 x 50mm x 2 mm Thick with and including connection to trusses all to approval	LM	60		
	<u>Fascia board</u>				
F	500 x 5mm Thick mild steel sheet in Fascia/verge board with and incuding 25 x 25 x 1.2mm thick steel support framework.	LM	36		
	<u>Sundries.</u>				
G	100mmx100mmx10mm thick base pate with 4 no bolt holes.	NO	15		
I	Allow for drilling holes into concrete surfaces and morticing 10mm diameter 150mm long bolt into into it, bolting it to either angle line or base plate and making good on all disturbed areas.	NO	60		
J	150mm long by 10mm diameter bolt.	NO	240		
	<u>Prime stop and apply one undercoat and two finishing coats of gloss paint to CROWN PAINTS first quality or other equal and approved to metal surfaces of:</u>				
E	To metal surfaces of fascia board.	LM	72		
	TOTAL FOR ROOFING WORKS AND RAIN WATER DISPOSAL CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>DOORS</u>				
	<u>DOOR LINTELS</u>				
A	Supply and fix 200mm x 350mm Reinforced precast door lintols	LM	3		
	<u>45mm thick post formed solid core flush door faced both sides with 4mm thick hardwood imported Veneer,45X20 mm hard wood lipping 10mm all round wide routed groved pattern on both side all as per Architects drawings</u>				
B	Door size 1000 x 2100mm high (D1)	NO	2		
	<u>18mm thick chipboard door both sides faced both sides with 4mm thick hardwood melamine Veneer,15X15 mm hard wood lipping all round all as per Architects drawings</u>				
C	Door size 900 x 2100mm high (D2)	NO	5		
D	Door size 1000 x 2100mm high (D3)	NO	2		
	<u>All in wrot Hardwood</u>				
E	125 x 50mm Door frame rebated	LM	11		
F	25 x 25mm splayed architrave	LM	11		
G	20mm Quadrant beading	LM	11		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>Ironmongery</u>				
	<u>Supply and Fix the following ironmongery : Locks and furniture where applicable are to be equal to those manufactured by UNION and approved by the Architect</u>				
A	100mm Stainless steel butt hinges and screws.	PRS	4		
B	100mm aluminium hinges and screws.	PRS	14		
C	2 lever Mortice Door lock with furniture.	NO	2		
D	Aluminium door latch with furniture	No	7		
E	Polished brass door handle		2		
F	Aluminium door handle		7		
G	Rubber Door stop.	NO	9		
H	25 x 16mm approved mild steel door frame cramps 250mm long build into wall or concrete	NO	12		
	<u>Painting and Decorating</u>				
	Knot, stop,prepare and apply one undercoat and two finishing coats of polyurethane varnish to CROWN Paints first quality or other equal and approval to:				
I	General timber surfaces	SM	18		
J	Ditto to frames 0-100mm	LM	11		
K	Ditto to frames 100-200mm	LM	11		
	Carried to Collection				
	<u>COLLECTION</u>				
	Brought forward from page WS/7				
	Brought forward from page ABOVE				
	TOTAL FOR DOORS CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<p><u>WINDOWS</u></p> <p><u>Mild Steel louvred windows</u></p> <p>Mild steel louvred blades windows in 75x50mm all round framing in filled with 2mm thick louvre blades: complete with fixing lugs, all prepainted with ant-rust primer before fixing, all to Architect detail.</p> <p>Size 3000x1200mm high</p>	No	2		
	<p><u>Supply and fix the following purpose made standard 'T' section heavy duty mild steel casement windows.</u></p>				
D	Overall Size 2400 x 600 mm high.	NO	2		
E	Overall Size 600 x 1950 mm high.	NO	4		
	<p><u>Glass and glazing</u></p> <p><u>6mm Thick FROSTED sheet glass and glazing to metal with approved putty</u></p>				
I	Panes 0.10 - 0.50 square meters	NO	8		
	<p><u>Prime stop and apply one undercoat and two finishing coats of gloss paint to CROWN PAINTS first quality or other equal and approved to metal surfaces of:</u></p>				
J	To metal surfaces including over grilles measured flat one side.	SM	16		
	TOTAL FOR WINDOWS CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>FINISHES</u>				
	<u>FLOOR</u>				
	<u>BACKGROUND Mortar: Cement and sand (1.4) wood floated.</u>				
A	20mm thick to receive tiles.	SM	54		
B	Ditto 150mm high in skirting.	LM	100		
	<u>Supply and Fix 10mm thick ceramic floor tiles</u>				
C	In screeded floor beds.	SM	54		
D	Ditto 100mm high in skirting.	LM	100		
	<u>WALL FINISH</u>				
	<u>EXTERNAL WALL FINISH</u>				
	<u>CEMENT AND WASHED SAND (1:4) RENDER WOOD floated</u>				
E	Plaster work	SM	134		
	<u>PAINTING AND DECORATION</u>				
	<u>PREPARE AND APPLY THREE COATS first grade waeathered emulsion paint to CROWN PAINTS or other equal and approved on</u>				
F	Pastered wall surfaces externall	SM	134		
G	Horizontal and vertical keying to approval.	SM	46		
	<u>INTERNAL WALL FINISHES</u>				
	<u>INTERNAL LIME PLASTER first coat of cement and sand (1:2:9) second coat of cement , lime putty and sand (1:1:6) steel trowelled smooth</u>				
H	12mm thick to masonry surfaces Internally	SM	188		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>PAINING AND DECORATIONS</u>				
	<u>Allow for skimming and sanding, Prepare and apply one undercoat and two finishing Coats first grade waeathered emulsion paint to CROWN PAINTS or other equal and approved on</u>				
A	Steel trowelled Plastered masonry surfaces	SM	188		
	<u>WALL TILE FINISHES</u>				
	<u>CEMENT AND WASHED SAND (1:4) WOOD floated TO WALLS TO RECEIVE TILES</u>				
B	12mm thick to masonry and concrete surfaces Internally	SM	43		
	<u>Wall Tiles</u>				
C	Supply and Fix 300x300x8mm thick ceramic wall tiles laid in approved pattern and spacing with and including approved tile adhesive on prepared render (m.s): jointed and pointed in approved coloured and anti-fungal proprietary grout, allow for the tile spacers.	SM	43		
D	Supply and fix aluminium or other equal and approved edge strips all to approval.	LM	30		
	<u>COLLECTION PAGE</u>				
	Brought forward from page WS/10				
	Brought forward from page above				
	TOTAL FOR FINISHES CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<p><u>BULIDERS WORK IN CONNECTION WITH SPECIALIST SERVICES</u></p> <p><u>(ALL PROVISIONAL)</u></p> <p><u>NOTE:</u> The allowance for Plumbing and Electrical installations is including in Prime Cost and Provisional Sums under P.C. Sums and only builders work is measured under a different element.</p> <p><u>BULIDERS WORK IN CONNECTION WITH PLUMBING INSTALLATION</u></p> <p>Cut away for and make good after Plumber installing concealed pipe system to the following items including cutting or leaving all holes, notches, mortises, sinking, chases, both in the structure and its finishes and for all making good in connection therewith.</p>				
A	Cut horizontal or vertical chase in masonry work for small pipe and make good	LM.	10		
B	Make or leave hole for 200mm thick masonry in small pipe and make good	NO.	10		
C	Ditto <u>but</u> for large pipe	NO.	10		
	TOTAL CARRIED TO COLLECTION				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<p><u>BUILDERS WORK IN CONNECTION WITH ELECTRICAL INSTALLATION.</u></p> <p>Cut away for and make good after Electrical installing concealed pipe system to the following items including cutting or leaving all holes, notches, mortises, sinking, chases, both in the structure and its finishes and for all making good in connection therewith.</p>				
A	Lighting points and associated switch points	NO.	20		
B	External securely fittings and associated switch points	NO	10		
C	13AMP socket outlet points with associated switch points	NO.	10		
D	Consumer unit	NO.	1		
E	Distribution board and meter board etc.	NO.	1		
F	Fire alarm points	NO.	4		
	TOTAL CARRIED TO COLLECTION				
	<u>COLLECTION</u>				
	Brought from page WS/12				
	Brought from				
	TOTALFOR BUILDERS WORK IN CONNECTION WITH SPECIALIST SERVICES CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>BUILDERS WORK SUMMARY</u>				
1	Substructures				
2	Concrete superstructure.				
3	Walling				
4	Roofing and Rain Water Disposal.				
5	Doors				
6	Windows				
7	Finishes				
8	Builders Work in Connection with Specialist Services				
	TOTAL FOR BUILDERS WORK FOR 1 NO WASHROOM CARRIED TO SUMMARY.				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>PROVISIONAL & PRIME COST SUMS</u>				
	<u>PRIME COST SUMS</u>				
A	Provide a sum of KENYA SHILLINGS (.....) only washrooms sanitary fittings to be executed complete by a approved domestic subcontractor.				<i>Priced in respective volumes</i>
B	Allow for profit				<i>To be included in rates for these works</i>
C	Allow for attendance				<i>To be included in rates for these works</i>
D	Provide a sum of KENYA SHILLINGS (.....) only washrooms PPR Pipework (Internal Plumbing) to be executed complete by a approved domestic subcontractor.				<i>Priced in respective volumes</i>
E	Allow for profit				<i>To be included in rates for these works</i>
F	Allow for attendance				<i>To be included in rates for these works</i>
G	Provide a sum of KENYA SHILLINGS ONE HUNDRED AND SIXTY THOUSAND, NINETY EIGHT (160,098.00) only for washrooms foul water internal drainage UPVC Pipework to be executed complete by a approved domestic subcontractor.				<i>Priced in respective volumes</i>
H	Allow for profit				<i>To be included in rates for these works</i>
I	Allow for attendance				<i>To be included in rates for these works</i>
J	Provide a sum of KENYA SHILLINGS (.....) only washrooms fire fighting (Portable fire extinguishers) to be executed complete by a approved domestic subcontractor.				<i>Priced in respective volumes</i>
K	Allow for profit				<i>To be included in rates for these works</i>
L	Allow for attendance				<i>To be included in rates for these works</i>
M	Provide a sum of KENYA SHILLINGS (.....) only for washroom Electrical Power Distribution to be executed complete by a approved domestic subcontractor.				<i>Priced in respective volumes</i>
N	Allow for profit				<i>To be included in rates for these works</i>
O	Allow for attendance				<i>To be included in rates for these works</i>
	Carried To Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
A	Provide a sum of KENYA SHILLINGS(.....) only for washroom lighting and power outlets to be executed complete by a approved domestic subcontractor.				
B	Allow for profit				
C	Allow for attendance				
D	Provide a sum of KENYA SHILLINGS (.....) only for Incoming Power Distribution to be executed complete by a approved domestic subcontractor.				
E	Allow for profit				
F	Allow for attendance				
<u>PROVISIONAL SUMS</u>					
G	Provide a sum of KENYA SHILLINGS EIGHTY THREE THOUSAND, TWO HUNDRED (83,200.00) only for washrooms roof tanks (Break tanks)				83,200.0
H	Provide a sum of KENYA SHILLINGS FORTY ONE THOUSAND, SIX HUNDRED (41,600.00) only for additional Rain water drainage management.				41,600.0
I	Provide a sum of KENYA SHILLINGS ONE MILLION FIVE HUNDRED THOUSAND (1,500,000.00) only for washroom foul water external drainage.				1,500,000.0
J	Provide a sum of KENYA SHILLINGS TWO HUNDRED THOUSAND (200,000.00) only for builder's work in connection to roof water tank				200,000.00
Carried To Collection					
COLLECTION					
Brought From page WS/15					
Brought From page above					
TOTAL FOR PC & PS CARRIED TO COLLECTION					

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSH)
	<u>SUMMARY FOR BILL NO.12 WASHROOMS</u>				
	<u>ELEMENT</u>				
1	BUILDERS WORK				
2	PRIME COST AND PROVISIONAL SUMS.				
	<u>Subtotal (a)</u>				
	<u>Multiply by Number of Washrooms</u>				3.0
	TOTAL AMOUNT FOR BILL NO.12- STAND ALONE WASHROOMS CARRIED TO GRAND SUMMARY				

BILL NO. 12

**PAVILION FOR SOCCER
PITCH A**

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>BILL NO. 13 : PAVILION FOR SOCCER PITCH A</u>				
	<u>ELEMET NO. 1 - SUBSTRUCTURE</u>				
	<u>Excavations.</u>				
	(Contractor to note that all measureemnts are net and allow for extra excavations for working space as it will be necessitated by the site conditions).				
	<u>Oversite Excavations.</u>				
A	Excavate oversite average 100mm deep starting from existing ground level to remove vegetable soil and cart away.	SM	435		
	<u>Excavation for foundations.</u>				
B	Excavate for Column bases starting from stripped level and not exceeding 1.50m deep	CM	61		
C	Ditto exceeding 1.5m deep but not exceeding 3.0m deep.	CM	61		
D	Excavate for retaining wall strip foundation starting from reduced level and not exceeding 1.50m deep	CM	68		
E	Ditto exceeding 1.5m deep but not exceeding 3.0m deep.	CM	68		
F	Excavate for Masonry strip foundation starting from reduced level and not exceeding 1.50m deep	CM	159		
G	Ditto exceeding 1.5m deep but not exceeding 3.0m deep.	CM	159		
H	Extra over for excavation in rock.	CM	115		
	<u>Disposal of excavated materials</u>				
I	Return fill and ram selected excavated materials around foundations.	CM	421		
K	Remove excavated materials from site as directed.	CM	155		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>Planking and Water exclusion</u>				
A	Allow for planking and strutting to uphold sides of excavations	Item	1		
B	Ditto but keeping all excavations free from running or underground water by pumping or pailing	Item	1		
	<u>Approved Hardcore</u>				
C	Approved hardcore compacted and watered in layers of 150mm	CM	435		
D	50mm thick stone dust/murram blinding	SM	435		
	<u>Anti-termite Treatment</u>				
E	Chemical anti-termite treatment as 'Termidor EC 25' to blinded surfaces	SM	435		
	<u>THERMAL AND MOISTURE PROTECTION</u>				
F	500 gauge polythene damp proof membrane under floor bed with 150mm side and ends laps	SM	435		
G	Damp - Poof course B.S 743 , Type A , Bitumen hessian base Horizontal 200 mm wide	LM	177		
	<u>Concrete works</u>				
	<u>Mass concrete 1:4:8 mix as described in;</u>				
H	50mm thick blinding under strip footing	SM	106		
I	Ditto retaining wall strip footing.	SM	36		
J	Ditto column bases	SM	41		
	<u>In-situ vibrated reinforced concrete (class 25/20mm as before described in;</u>				
K	Column bases	CM	20		
L	Columns in foundations.	CM	3		
M	Retaining wall strip footing.	CM	18		
N	Foundation strip footing for masonry walling.	CM	21		
O	150mm Thick floor bed.	SM	435		
P	200mm Thick in retaining wall	SM	60		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>ALL PROVISIONAL</u>				
	<u>Supply and fix steel reinforcement including cutting, bending, hooking, tying and supporting as required</u>				
	<u>High yield tensile square twisted bars to B.S 4461</u>				
A	Assorted Reinforcement bars of various sizes	KG	12,746		
	<u>Mesh fabric reinforcement to B.S 4483 set in concrete with 300mm side and end laps</u>				
B	High yield tensile square twisted bars to B.S 4461	SM	435		
	<u>Sawn formwork to:</u>				
C	Sides of strip foundation.	SM	71		
D	Sides of Retaining wall footing.	SM	30		
E	Sides of column bases.	SM	48		
F	Sides of columns.	SM	38		
G	Sides of Retaining walls.	SM	121		
H	Edges of floor bed 75 - 150mm grith.	LM	100		
	<u>Foundation Walling.</u>				
	Approved Load bearing natural stone walling bedded and jointed in cement sand (1:4) mortar including 25mm x 20 gauge hoop iron reinforcement at every alternate course				
I	200mm thick walling	SM	354		
	Carried to Collection				
	<u>COLLECTION</u>				
A	Brought forward from page PAV/1				
B	Brought forward from page PAV/2				
C	Brought forward from page PAV/.3				
	TOTAL FOR SUBSTRUCTURES CARRIED TO SUMMARY.				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>ELEMET NO. 2 - CONCRETE SUPERSTRUCTURE</u>				
	<u>In-situ vibrated reinforced concrete (class 25/20mm as before described in;</u>				
A	Columns	CM	8		
B	Beams	CM	15		
C	Terrace Steps	CM	52		
D	200 mm thick suspended slab	SM	109		
E	200mm Thick in slopping waist	SM	272		
	<u>ALL PROVISIONAL</u>				
	<u>Supply and fix steel reinforcement including cutting, bending, hooking, tying and supporting as required</u>				
	<u>High yield tensile square twisted bars to B.S 4461</u>				
F	Assorted Reinforcement bars of various sizes	KG	19,702		
	<u>Sawn formwork to;</u>				
G	Sides of columns.	SM	108		
H	Sides and soffits of horizontal beams	SM	127		
I	Soffits of horizontal suspended solid slab	SM	109		
J	Ditto slopping.	SM	272		
K	Ditto 150 - 225mm girth at edges of suspended slab.	LM.	100		
	TOTAL FOR CONCRETE SUPERSTRUCTURE CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<p><u>ELEMET NO. 3 - WALLING</u></p> <p><u>Approved natural stone walling bedded and jointed in cement sand (1:4) mortar reinforced with and including 25mm x 20 gauge hoop iron at every alternate course</u></p>				
A	200mm thick walling Externally	SM	365		
B	Ditto internally	SM	550		
C	100mm Thick	SM	202		
	TOTAL FOR WALLING CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<p><u>ELEMET NO. 4 - HANDRAILS AND BALUSTRADES</u></p> <p><u>The following in staircase balustrading in stainless steel</u></p> <p><u>25 mm diameter x 900 mm high,comprising of 50 mm diameter hand rail welded to the baluster,25 mm Diameter Horizontal runners welded to the baluster , 600 center to center balusters with one end bolted into concrete surface and making good the disturbed areas to receive hand rails 900 mm high</u></p>				
A	Sloping balustrade to stairs	LM	27		
B	In edges of pavilions.	LM	38		
	TOTAL FOR HANDRAILS AND BALUSTRADES CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>ELEMET NO. 5 - ROOFING WORKS AND RAIN WATER DISPOSAL</u>				
	<u>Covering</u>				
A	Prepainted G.I Gauge 24 box profile roofing sheets laid with 150mm side and end laps fixed to steel purlins (m/s) with and including J bolts with hexagonal nuts and PVC washer tropicalized caps and drilling holes for noths through sheeting all factory curved in radius to detail <u>Structural Steel Works.</u>	SM	544		
	<u>The following in structural mild steel framework to B.S 449, all prepainted with ant-rust primer before fixing raised to a height not exceeding 10m above ground level all as per Engineer's details, all welds to be ground and polished smooth all to approval.</u>				
B	50mm internal diameter x 3mm thick CHS in back support braces	KGS	113		
C	100mm x75mm x 4mm thick RHS in wall plate	KGS	304		
D	50mm internal diameter x 3mm thick CHS in trusses	KGS	716		
E	Ditto in bracings/girders	KGS	1,728		
F	Zed Purlins 100 x 50mm x 2 mm Thick	LM	320		
G	20mm anti-sag rods	LM	272		
	<u>Fascia board</u>				
	50 x 25 x 2mm thick RHS in framework welded to trusses to receive mild steel sheet fascia (m/s)	KGS	625		
H	500 x 5mm Thick mild steel sheet in Fascia/verge board	LM	100		
	<u>Sundries.</u>				
I	100mmx100mmx15mm thick base pate with 4 no bolt holes.	NO	6		
J	100mm long x50mmx50mm x 10 mm thick angle line with 2 no bolt holes.	NO	12		
	Carried to collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	Allow for drilling holes into concrete surfaces and morticing 10mm diameter 150mm long bolt into into it, bolting it to either angle line or base plate and making good on all disturbed areas.	NO	12		
B	150mm long by 10mm diameter bolt.	NO	48		
	30 gauge galvanised mini corrugated mild steel sheet				
C	600 mm valley gutters	LM	10		
D	600 mm girth flashing	LM	10		
	UPVC pipes ,gutters and fittings				
E	100 mm diameter down pipe.	LM	16		
F	Extra over for rain water shoe	No.	2		
	<u>Painting and Decorating</u>				
G	Prepare and apply three coats gross oil paint to metal surfaces girth 150-225mm wide.	LM	1,133		
H	Ditto fascia board.	LM	1,340		
	Carried to collection				
	COLLECTION Brought forward from page PAV/ 7 Brought forward from page PAV/ 8				
	TOTAL FOR ROOFING WORKS AND RAIN WATER DISPOSAL CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>ELEMET NO. 6 - DOORS</u>				
	<u>DOOR LINTELS</u>				
A	Supply and fix 200mm x 350mm Reinforced precast door lintols	LM	35		
	<u>Mild Steel bugler proof door</u>				
	Steel Grille door size 2000 x 2400mm high overall in 4No equal panels, 40X40X4mm main frame,40X40 mm R.H.s frame to door leaf,25X25 mm R.H.S horizontal bars at 500 mm centers and two vertical member,4mm square Ms Plate patterned infill bars: complete with fixing lugs, pairs butt hinges hasps for padlock and 2 lever rebate locks to Architect detail.	No.	3		
	<u>45mm thick solid core flush door faced both sides with 4mm thick hardwood imported Veneer,45X20 mm hard wood lipping all round all as per Architects drawings</u>				
B	Door size 1100 x 2150mm high.	NO	8		
C	Ditto 900 x 2150mm high.	NO	9		
D	Ditto 800 x 2150mm high.	NO	12		
	<u>All in wrot Hardwood</u>				
E	200 x 50mm Door frame rebated	LM	148		
F	Ditto Transomes	LM	27		
G	25 x 25mm splayed architrave	LM	148		
H	20mm Quadrant beading	LM	148		
I	Plastic weathering apron around glass edges	LM	70		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>Ironmongery</u>				
	<u>Supply and Fix the following ironmongery : Locks and furniture where applicable are to be equal to those manufactured by UNION and approved by the Architect</u>				
A	100 x 76 x 3 mm Stainless steel bal hinges Ref : HN-BB-403030 SS	PRS	58		
B	3 lever Mortice Door lock with furniture.	NO	9		
C	2 lever Mortice Door lock with furniture.	NO	20		
D	Stainless - PUSH- Plate 300 x 75 mm . Ref : 300 - 75 SS	NO	29		
E	Stainless Conceal fix pul Handle 300 c 25 mm . Ref : CF - 225 - 19 SS	NO	29		
F	Stainless steel Coat and Hat Hook rubber Tip :Ref CH -39SS	PRS	29		
G	Stainless Steel Male / Female / Disabled sign - Circular . Ref : M/F/DSC -75SS	NO	2		
H	Door Stop Oval satin Nickle - Floor Mounted . Ref DH005 - SN	NO	29		
I	25 x 16mm approved mild steel door frame cramps 250mm long build into wall or concrete	NO	145		
	<u>Painting and Decorating</u>				
J	Prepare and apply one undercoat and two finishing coats of polyurethane varnish general timber surfaces	SM	128		
K	Ditto to frames 0-100mm	LM	174		
L	Ditto to frames 100-200mm	LM	296		
	Carried to Collection				
	<u>COLLECTION</u>				
	Brought forward from page PAV/9				
	Brought forward from page PAV/10				
	TOTAL FOR DOORS CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>ELEMET NO. 7 - WINDOWS</u>				
	<u>Curtain rail</u>				
A	20 mm diameter wrought iron bars on brackets with 40 mm diameter curtain rings and decorative ends.	LM	19		
	<u>MDF Window Encasing</u>				
B	200 x 20 mm encasing all around the window opening	LM	86		
	<u>Hard wood window cills.</u>				
C	150X25 mm hardwood internal cills.	LM	19		
	<u>Supply and fix the following purpose made standard 'T' section heavy duty mild steel casement windows complete with 12mm square bar burglar proofing</u>				
D	Overall Size 900 x 1200 mm high.	NO	2		
E	Overall Size 900 x 800 mm high.	NO	2		
F	Overall Size 800 x 2000 mm high.	NO	12		
G	Overall Size 2000 x 1000 mm high.	NO	1		
	<u>Glass and glazing</u>				
	<u>4mm Thick clear sheet glass and glazing to metal with approved putty</u>				
H	Panes 0.10 - 0.50 square meters	NO	25		
	<u>4mm Thick obscure sheet glass and glazing to metal with approved putty</u>				
I	Panes 0.10 - 0.50 square meters	NO	5		
	<u>Painting and Decorating</u>				
J	Prepare and apply three coats of gloss oil paint to metal surfaces including over grille	SM	30		
K	Ditto but clear varnish to timber surfaces 100-200mm	LM	105		
	TOTAL FOR WINDOWS CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>ELEMET NO. 8 - FINISHES</u>				
	<u>FLOOR</u>				
	<u>BACKGROUND Mortar: Cement and sand (1.4) wood floated.</u>				
A	20mm thick to receive tiles.	SM	287		
B	25mm Thick Ditto steel trowelled to a smooth finish.	SM	50		
C	Ditto to terraces steps and treads.	SM	421		
D	Ditto 100mm high in skirting.	LM	100		
	<u>Supply and Fix 10mm thick ceramic floor tiles</u>				
E	In screeded floor beds.	SM	287		
F	Ditto 100mm high in skirting.	LM	100		
	<u>Terrazo pavings</u>				
D	20mm thick terrazo paving on seating terraces, edges and risers including upv dividing strips.	SM	421		
E	Extra over for forming anti-slip strips on treads	LM	180		
	<u>WALL FINISH</u>				
	<u>EXTERNAL WALL FINISH</u>				
	<u>CEMENT AND WASHED SAND (1:4) RENDER WOOD floated</u>				
G	Plaster work	SM	218		
H	250mm wide precast concrete coping	LM	76		
	<u>PAINTING AND DECORATION</u>				
	<u>PREPARE AND APPLY THREE COATS first grade waeathered emulsion paint :on</u>				
I	Pastered wall surfaces externall	SM	218		
J	Horizontal and vertical keying to approval.	SM	245		
	Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>INTERNAL WALL FINISHES</u>				
	<u>INTERNAL LIME PLASTER first coat of cement and sand (1:2:9) second coat of cement , lime putty and sand (1:1:6) steel trowelled smooth</u>				
A	12mm thick to masonry surfaces Internally	SM	1,651		
B	Ditto to the concrete surfaces of columns	SM	108		
	<u>PAINING AND DECORATIONS</u>				
	<u>PREPARE AND APPLY THREE COATS first grade waeathered emulsion paint :on</u>				
C	Steel trowelled Plastered masonry surfaces	SM	1,651		
D	Ditto to the concrete surfaces of columns	SM	108		
E	Ditto to beams	SM	127		
F	Ditto to slopping soffits of suspended slab	SM	272		
G	Ditto Horizontal	SM	109		
	<u>WALL TILE FINISHES</u>				
	<u>CEMENT AND WASHED SAND (1:4) WOOD floated TO WALLS TO RECEIVE TILES</u>				
H	12mm thick to masonry and concrete surfaces Internally	SM	120		
	<u>Wall Tiles</u>				
I	Supply and Fix 8mm thick porcelain wall tiles to screeded wall surfaces.	SM	120		
	<u>CEILING FINISHES</u>				
	<u>INTERNAL LIME PLASTER first coat of cement and sand (1:2:9) second coat of cement , lime putty and sand (1:1:6) steel trowelled smooth</u>				
J	Ditto to beams	SM	127		
K	Ditto to slopping soffits of suspended slab	SM	272		
L	Ditto Horizontal	SM	109		
	Carried to collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>PAINTING AND DECORATIONS</u>				
	<u>PREPARE AND APPLY THREE COATS first grade waeathered emulsion paint :on</u>				
A	Ditto to beams	SM	127		
B	Ditto to slopping soffits of suspended slab	SM	272		
C	Ditto Horizontal	SM	109		
	Carried to collection				
	<u>COLLECTION PAGE</u>				
	Brought forward from page PAV/ 12				
	Brought forward from page PAV/ 13				
	Brought down from PAV/ 14				
	TOTAL FOR FINISHES CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 09: JOINERY				
	<u>Benches, Worktops, Cupboards and Changing Lockers.</u>				
	Fabricate and changing rooms 450mm wide top seating by 450mm high benches. Benches to be made of 40x25x3mm RHS as the main structure all in top members running parallel at 450mm and top cross members at centres not more than 1200mm. H-Shaped supporting stands at centres not more than 1200mm and a running cross member welded to connect and support the stands all welded and polished to approval. The 450mm wide top seat to be of approved mvule timber battens of 75x25 spaced at equidistant interval not exceeding 25mm of sizes overall. The entire benches to be done to project manager satisfaction and as per Architect's drawings. Benches given in overall length but to be done in assorted lengths to fit in rooms as per Architect's details.				
A	2000 mm long in Changing Rooms	No	2		
B	Ditto 2300mm long	No	2		
C	Ditto 1700mm long	No	2		
	<u>CHANGING LOCKERS</u>				
D	Supply and Install Mild Steel Changing Lockers overall size 1600mm x 2000mm High, with 10 number lockable compartments in 2 rows all to approval.	No	6		
	<u>Worktops, Cupboards</u>				
	Insitu concrete class 15(19 mm aggregates):				
E	100 mm Thick plinth	Sm	15		
	Sawn formwork: to				
F	Vertical edges of plinth over 75 but not exceeding 150 mm high	Lm	37		
G	Fillet planted on form work to form rebate size 50 x 50 mm	Lm	37		
	Total Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	Cement and sand(1:4) screed paving: trowelled hard and smooth: on concrete: to				
A	Plinths.	Sm	4		
B	Kitchen worktops	Sm	11		
	Hardwood timber				
C	50x50mm approved hardwood timber	Lm	150		
D	25 x 25mm ditto	Lm	150		
	Moisture resistant (MR) blockboard to BS 3444 or equal nd approved: bonded with and including 25 x 15 mm hardwood lipping all round: spray painted to Architectural Details				
E	25 mm Thick in partitions, facings & shelves.	Sm	100		
F	Door size 700x 600mm high.	No.	50		
G	Ditto size 600 x 1900mm high to changing room lockers	No.	50		
	Walling.				
H	100mm thick walling as supports.	Sm	20		
	Concrete class 15(19 mm aggregates): Vibrated and reinforced.				
I	75mm thick VRC Class 25 worktop bed with and including reinforcement and formwork	Sm	10		
	12mm cement sand screed to receive ceramic tiles.				
J	On wall surfaces.	Sm	40		
	<u>Wall Tiles</u>				
K	Supply and Fix 8mm thick porcelain wall tiles to screeded wall surfaces.	SM	40		
	Total Carried to Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>Drawers.</u>				
A	Drawers size 800 x 600 x 200 mm high comprising of 20mm Moisture resistant blockboard with and including fixing accessories and bearers ; and fixing to position as per architectural details and or approval	No	15		
	<u>Supply and fix the following ironmongery as union or other equal and approved manufacturers with matching screws:</u>				
B	Malpa hinges	Prs	100		
C	Door locks.	No	30		
D	Magnetic ball catches.	No	30		
E	Barrel bolts	No	30		
F	100mm brass D- door handles.	No	30		
G	Ditto drawer handles	No	15		
	<u>Prepare and apply one coat aluminium primer before fixing to:</u>				
H	Back of wood 0 - 100mm girth.	Lm	250		
	<u>Prepare, knot primer, stop and apply three polyurethane on woodwork to:</u>				
I	Surfaces 100 - 200mm girth.	Lm	250		
	<u>Prepare, knot primer, stop and apply two undercoats and one finishing coat gloss paint</u>				
J	Surfaces 100 - 200mm girth.	Lm	250		
K	Surfaces 200 - 300mm girth.	Lm	250		
L	General Surfaces	Sm	200		
	Total Carried to Collection				
	Collection				
	Brought down from page PAV/ 15				
	Brought down from page PAV/ 16				
	Brought down from page PAV/ 17				
	TOTAL FOR FITTINGS & FIXTURES CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<p><u>ELEMET NO. 10 - BULIDERS WORK IN CONNECTION WITH SPECIALIST SERVICES</u></p> <p><u>(ALL PROVISIONAL)</u></p> <p><u>NOTE:</u> The allowance for Plumbing and Electrical installations is including in Prime Cost and Provisional Sums under P.C. Sums and only builders work is measured under this Element No. H</p> <p><u>BULIDERS WORK IN CONNECTION WITH PLUMBING INSTALLATION</u></p> <p>Cut away for and make good after Plumber installing concealed pipe system to the following items including cutting or leaving all holes, notches, mortises, sinking, chases, both in the structure and its finishes and for all making good in connection therewith.</p>				
A	Cut horizontal or vertical chase in masonry work for small pipe and make good	LM.	200		
B	Make or leave hole for 200mm thick masonry in small pipe and make good	NO.	200		
C	Ditto <u>but</u> for large pipe	NO.	100		
	TOTAL CARRIED TO COLLECTION				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<p><u>BUILDERS WORK IN CONNECTION WITH ELECTRICAL INSTALLATION.</u></p> <p>Cut away for and make good after Electrical installing concealed pipe system to the following items including cutting or leaving all holes, notches, mortises, sinking, chases, both in the structure and its finishes and for all making good in connection therewith.</p>				
A	Lighting points and associated switch points	NO.	20		
B	External securely fittings and associated switch points	NO	20		
C	13AMP socket outlet points with associated switch points	NO.	20		
D	Consumer unit	NO.	4		
E	Distribution board and meter board etc.	NO.	1		
F	Fire alarm points	NO.	4		
G	Data outlet point	NO.	2		
	TOTAL CARRIED TO COLLECTION				
	<u>COLLECTION</u>				
	Brought from page PAV/ 18				
	Brought from PAV/ 19				
	TOTAL FOR BUILDERS WORK IN CONNECTION WITH SPECIALIST SERVICES CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>PROVISIONAL & PRIME COST SUMS</u>				
	<u>PRIME COST SUMS</u>				
A	Provide a sum of KENYA SHILLINGS (.....) only sanitary fittings to be executed complete by a approved domestic subcontractor.				<i>Priced in respective volumes</i>
B	Allow for profit				<i>To be included in rates for these works</i>
C	Allow for attendance				<i>To be included in rates for these works</i>
D	Provide a sum of KENYA SHILLINGS (.....) only PPR Pipework (Internal Plumbing) to be executed complete by a approved domestic subcontractor.				<i>Priced in respective volumes</i>
E	Allow for profit				<i>To be included in rates for these works</i>
F	Allow for attendance				<i>To be included in rates for these works</i>
G	Provide a sum of KENYA SHILLINGS (.....) only for foul water internal drainage UPVC Pipework to be executed complete by a approved domestic subcontractor.				<i>Priced in respective volumes</i>
H	Allow for profit				<i>To be included in rates for these works</i>
I	Allow for attendance				<i>To be included in rates for these works</i>
J	Provide a sum of KENYA SHILLINGS THIRTY (.....) only fire fighting (Portable fire extinguishers) to be executed complete by a approved domestic subcontractor.				<i>Priced in respective volumes</i>
K	Allow for profit				<i>To be included in rates for these works</i>
L	Allow for attendance				<i>To be included in rates for these works</i>
	Carried To Collection				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	Provide a sum of KENYA SHILLINGS (.....) only for Electrical Power Distribution to be executed complete by a approved domestic subcontractor.	<i>Priced in respective volumes</i>			
B	Allow for profit	<i>To be included in rates for these works</i>			
C	Allow for attendance	<i>To be included in rates for these works</i>			
D	Provide a sum of KENYA SHILLINGS (.....) only for lighting and power outlets to be executed complete by a approved domestic subcontractor.	<i>Priced in respective volumes</i>			
E	Allow for profit	<i>To be included in rates for these works</i>			
F	Allow for attendance	<i>To be included in rates for these works</i>			
J	Provide a sum of KENYA SHILLINGS (.....) only for firefighting (Portable Fire Extinguishers) to be executed complete by a approved domestic subcontractor.	<i>Priced in respective volumes</i>			
K	Allow for profit	<i>To be included in rates for these works</i>			
I	Allow for attendance	<i>To be included in rates for these works</i>			
J	Provide a sum of KENYA SHILLINGS (.....) only for incoming power distribution to be executed complete by a approved domestic subcontractor.	<i>Priced in respective volumes</i>			
K	Allow for profit	<i>To be included in rates for these works</i>			
L	Allow for attendance	<i>To be included in rates for these works</i>			
Carried To Collection					

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>PROVISIONAL SUMS</u>				
A	Provide a sum of KENYA SHILLINGS SIXTY TWO THOUSAND, FOUR HUNDRED (62,400.00) only roof tanks (Break tanks)	SUM			62,400.0
B	Provide a sum of KENYA SHILLINGS EIGHTY THREE THOUSAND, TWO HUNDRED (83,200.00) only for Additional Rain water drainge management.	SUM			83,200.0
C	Provide a sum of KENYA SHILLINGS ONE MILLION (1,000,000.00) only for foul water external drainage.	SUM			1,000,000.0
D	Provide a sum of KENYA SHILLINGS TWO HUNDRED THOUSAND (200,000.00) only for builder's work in connection to roof water tank	SUM			200,000.0
	Carried To Collection				
	COLLECTION				
	Brought From page PAV/20				
	Brought From page PAV/21				
	Brought From page above				
	TOTAL FOR PC & PS CARRIED TO COLLECTION				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (CHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>SUMMARY</u>				
A	SUBSTRUCTURES				
B	SUPERSTRUCTURE CONCRETE				
C	WALLING				
D	HANDRAILS AND BALUSTRADES				
E	ROOFING WORKS & RAINWATER DISPOSAL				
F	DOORS				
G	WINDOWS				
H	FINISHES				
I	JOINERY				
J	BUILDERS WORK IN CONNECTION TO SERVICES				
K	PRIME COST AND PROVISIONAL SUMS				
	TOTAL AMOUNT FOR BILL NO 13. - PAVILION FOR SOCCER PITCH A CARRIED TO GRAND SUMMARY				-

BILL NO. 14

**PARKING, FOOH PATHS &
EARTH DRAINS**

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>BILL NO. 14 : PARKING, FOOTPATH&SWALE</u>				
	<u>ELEMENT NO. 01: FOOTH PATHS(All provisional)</u>				
	<u>Excavation to reduce level</u>				
A	Excavate to to reduce levels from existing ground level to depth not excceding 1.5m, load and cart away from site as directed.	CM	1,625		
	<u>Sub-grade</u>				
B	Roll and compact subgrade formation to achieve 98% modified proctors MDD including grading to falls and crossfalls	SM	3,250		
	<u>Fillings</u>				
C	Supply and lay graded Murram average laid at a slope of 1:0%, well watered and compacted to 98% MDD at optimum moisture content in layers NOT Exceeding 150mm Thick to Engineer's approval.	CM	1,625		
	<u>Channel</u>				
D	Provide, lay and joint Channel, 125x150mm flush channel block, laid on and including 450x100mm concrete (1:3:6) bed and 100x200mm haunching behind	LM	2,600		
	TOTAL FOR FOOT PATHS CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<p><u>ELEMENT NO. 2 - STORM WATER EARTH DRAIN</u> <u>(All provisional)</u></p> <p><u>Earth Drain Excavation</u></p>				
A	Excavate average depth not exceeding 1500mm deep load and cart away.	CM	2,723		
B	Allow for Trimming sides to appropriate slope.	SM	4,536		
	TOTAL FOR EARTH DRAIN CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>PARKING.</u>				
	<u>EXCAVATIONS</u>				
A	Excavate to formation level not exceeding 1.5 m deep ground level and dispose as directed by the Engineer	SM	3,960		
D	Extra over excavation for excavating rock.	CM	198		
	<u>Sub-grade</u>				
B	Roll and compact subgrade formation to achieve 98% modified proctors MDD including grading to falls and crossfalls	SM	3,960		
	<u>Fillings</u>				
C	Supply and lay graded Murram average laid at a slope of 1:0%, well watered and compacted to 98% MDD at optimum moisture content in layers NOT Exceeding 150mm Thick to Engineer's approval.	CM	1,980		
	<u>ROAD KERBS</u>				
G	Provide, lay and joint along the edge of the road 200mm cut stone kerb including excavation 100 x 225 mm bed, 100 x 300mm haunch (concrete mix 1:3) any necessary formwork and disposal of surplus material as directed.	LM	259		
H	Ditto but curved to varying radii as shown on the plan	LM	100		
	<u>CHANNELS</u>				
I	Provide, lay and joint along the edge of the road 200mm cut stone kerb and 200 mm channel, including excavation, 350 x 100mm haunch (mix 1:3:6), any necessary formwork and disposal of surplus material	LM	154		
J	Prepare and apply two coats of road marking paint 100mm wide on car park area and continuous lines for road demarcation.	LM	300		
	TOTAL FOR PARKINGS CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>MURRAM ROAD (APPROX 200M)</u>				
	<u>EXCAVATIONS</u>				
A	Excavate to formation level not exceeding 1.5 m deep ground level and dispose as directed by the Engineer	CM	1,280		
	<u>CONSTRUCTION</u>				
B	Trim formation to correct level cross - falls, and longitudinal falls	SM	1,600		
C	Roll and compact subgrade formation to achieve 98% modified proctors MDD including grading to falls and crossfalls	SM	1,600		
	<u>Fillings</u>				
D	Imported and approved murram backfill materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in 1 layers not exceeding 150mm Thick to Engineer's approval	CM	480		
	<u>Murram Surface Finish.</u>				
E	Supply and lay graded Murram average 300mm Thick laid at a slope of 1:0%, well watered and compacted to 98% MDD at optimum moisture content in 3 layers each of 100mm Thick to Engineer's approval.	SM	1,600		
	<u>Channels</u>				
F	Provide, lay and joint Channel, 125x150mm flush channel block, laid on and including 450x100mm concrete (1:3:6) bed and 100x200mm haunching behind	LM	350		
	TOTAL FOR ROAD WORKS, PAVINGS AND PARKINGS CARRIED TO SUMMARY				

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>SUMMARY FOR BILL NO. 14</u>				
1	FOOTH PATHS				
2	EARTH DRAIN				
3	PARKING.				
4	MURRAM FINISH ROAD				
	TOTAL ESTIMATE FOR BILL NO 14- PARKING, FOOT PATHS & EARTH DRAINS CARRIED TO GRAND SUMMARY				

BILL NO. 15

**SHARED PRIME COSTS AND
PROVISIONAL SUMS**

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	RATE	AMOUNT (KSHS.)
	<u>BILL NO. 15 - SHARED PRIME COSTS AND PROVISIONAL SUMS</u>		
	<u>PRIME COST SUMS</u>		
A	Provide a sum of KENYA SHILLINGS (.....) only external water reticulation to be executed complete by a approved domestic specialist subcontractor.	 <i>Priced in respective volumes</i>	
B	Allow for profit	 <i>To be included in rates for these works</i>	
C	Allow for attendance	 <i>To be included in rates for these works</i>	
D	Provide a sum of KENYA SHILLINGS (.....) only water pumps and Controls to be executed complete by a approved domestic specialist subcontractor.	 <i>Priced in respective volumes</i>	
E	Allow for profit	 <i>To be included in rates for these works</i>	
F	Allow for attendance	 <i>To be included in rates for these works</i>	
G	Provide a sum of KENYA SHILLINGS (.....) only for irrigation pumps and filters to be executed complete by a approved domestic specialist subcontractor.	 <i>Priced in respective volumes</i>	
H	Allow for profit	 <i>To be included in rates for these works</i>	
I	Allow for attendance	 <i>To be included in rates for these works</i>	
J	Provide a sum of KENYA SHILLINGS (.....) only for external flood lighting and power distribution to be executed complete by a approved domestic specialist subcontractor.	 <i>Priced in respective volumes</i>	
K	Allow for profit	 <i>To be included in rates for these works</i>	
L	Allow for attendance	 <i>To be included in rates for these works</i>	
M	Provide a sum of KENYA SHILLINGS (.....) only for irrigation pipework, pop up sprinkler and fittings to be executed complete by a approved domestic specialist subcontractor.	 <i>Priced in respective volumes</i>	
N	Allow for profit	 <i>To be included in rates for these works</i>	
O	Allow for attendance	 <i>To be included in rates for these works</i>	
	Total Carried To Collection.		

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	RATE	AMOUNT (KSHS.)
A	Provide a sum of KENYA SHILLINGS (.....) only for elevated pressed steel tanks to be executed complete by a approved domestic specialist subcontractor.		
B	Allow for profit		
C	Allow for attendance		
D	Provide a sum of KENYA SHILLINGS (.....) underground tank incoming pipework, fittings & accessories complete by a approved domestic specialist subcontractor.		
E	Allow for profit		
F	Allow for attendance		
	<u>PROVISIONAL SUMS</u>		
G	Provide a sum of KENYA SHILLINGS FOUR MILLION FIVE HUNDRED THOUSAND (4,500,000.00) only main trunk sewer line and treatment plant.		4,500,000.00
H	Provide a sum of KENYA SHILLINGS ONE MILLION TWO HUNDRED THOUSAND (1,200,000.00) only for elevated water tank steel support systems		1,200,000.00
I	Provide a sum of KENYA SHILLINGS FOUR MILLION FIVE HUNDRED THOUSAND (4,500,000.00) only main trunk water intake		4,500,000.00
J	Provide a sum of KENYA SHILLINGS TWO HUNDRED THOUSAND (200,000.00) only for soil investigation and laboratory analysis/testing (minimum 15 samples) to be executed complete by a specialist.		200,000.00
K	Allow for Main Contractor's profit and attendance for the above (soil investigation and laboratory analysis/testing)%	
L	Provide a sum of KENYA SHILLINGS ONE HUNDRED AND FIFTY THOUSAND (150,000.00) only for concrete tests, Compaction tests (CBR), moisture content tests to be executed complete by a specialist.		150,000.00
M	Allow for Main Contractor's profit and attendance for the above (concrete tests, Compaction tests (CBR), moisture content tests).%	
	Total Carried To Collection.		

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

ITEM	DESCRIPTION	RATE	AMOUNT (KSHS.)
A	Provide a sum of KENYA SHILLINGS TWO HUNDRED AND FIFTY THOUSAND (250,000.00) only for Environmental and social management Plan.		250,000.00
B	Allow for Main Contractor's profit and attendance for the above (Environmental and social management Plan)%	
C	Provide a sum of KENYA SHILLINGS TWO MILLION FIVE HUNDRED THOUSAND (2,500,000.00) only for underground concrete water tank		2,500,000.00
D	Provide a sum of KENYA SHILLINGS FOUR HUNDRED (400,000.00) only for builder's work in connection to irrigation system works		400,000.00
	Total Carried To Collection.		
	<u>COLLECTION</u> B/F from page 1 B/F from page 2 B/F from page above		
	TOTAL COST FOR SHARED PRIME COSTS AND PROVISIONAL SUMS CARRIED TO GRAND SUMMARY		

GRAND SUMMARY

PROPOSED SPORTS FACILITY ON PLOT L.R. NO. 27425 - (NCHIRU) MERU-MAUA ROAD
MERU COUNTY.

GRAND SUMMARY.

ITEM	BILL No	DESCRIPTION	AMOUNT (KSH)	OFFICIAL USE.
1	Bill No.01	BIDDING DOCUMENT		
2	Bill No.02	SPECIFICATIONS AND TRADE PREAMBLES		
3	Bill No.03	PARTICULAR PRELIMINARIES		
4	Bill No.04	GENERAL PRELIMINARIES		
5	Bill No.05	SOCCER PITCH A (WITH RUNNING TRACK)		
6	Bill No.06	HOCKEY PITCH A		
7	Bill No.07	HOCKEY PITCH B		
8	Bill No.08	BASKETBALL PITCH		
9	Bill No.09	RUGBY PITCH		
10	Bill No.10	TENNIS COURT		
11	Bill No.11	SWIMMING POOL		
12	Bill No.12	STAND ALONE WASHROOMS		
13	Bill No.13	PAVILION FOR SOCCER PITCH A.		
14	Bill No.14	PARKING & FOOTH PATHS		
15	Bill No.15	SHARED PRIME COST & PROVISIONAL SUMS		
16	Vol. 2 of 3	SUMMARY FOR ELECTRICAL WORKS-BROUGHT FROM MAIN SUMMARY OF VOLUME 2 OF 3		
17	Vol. 3 of 3	SUMMARY FOR MECHANICAL WORKS-BROUGHT FROM MAIN SUMMARY OF VOLUME 3 OF 3		
18		SUBTOTAL NO. 01		
19		ADD 5% CONTINGENCY OF SUBTOTAL NO. 01		
20		TOTAL (V.A.T INCLUSIVE) CARRIED TO FORM OF TENDER.		

Amount of Tender in words: Kenya Shillings.....

Tenderer's signature and stamp.....

Address.....

Date.....

Witness Name and Signature.....

Description.....

Address.....

Date.....