



**JARAMOGI OGINGA ODINGA  
UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**TENDER DOCUMENT**

**TENDER NO: JOOUST/ONT/B3/34/2019-2020**

**FOR**

**TENDER FOR SUPPLY, INSTALLATION AND COMMISSIONING OF  
SANITARY FITTINGS PLUMBING, DRAINAGE, FIRE FIGHTING,  
WATER TANKS, INCOMING WATER SUPPLY AND WASTE WATER  
TREATMENT WORKS FOR THE TUITION BLOCK AT JARAMOGI  
ODINGA OGINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY,  
ACHIEGO CAMPUS**

**CLOSING DATE 23RD JULY 2020**

**OPENING DATE: 5TH AUGUST 2020**

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## SECTION I: INVITATION TO TENDER

**TENDER NO: JOOUST/ONT/B3/34/2019-2020**

**TENDER NAME: SUPPLY, INSTALLATION AND COMMISSIONING OF SANITARY FITTINGS, PLUMBING, DRAINAGE, FIRE FIGHTING, WATER TANKS, INCOMING WATER SUPPLY AND WASTE WATER TREATMENT WORKS FOR THE PROPOSED CONSTRUCTION OF TUITION BLOCKS, ACHIEGO**

- 1.1 **Jaramogi Oginga Odinga University of Science & Technology** invites sealed tenders from eligible tenderers for Supply, Installation and Commissioning of Sanitary Fittings, Plumbing, Drainage, Fire Fighting, Water Tanks, Incoming Water Supply And Waste Water Treatment Works For The Proposed Construction Of Tuition Blocks, Achiego.
- 1.2 Tender documents containing detailed specifications can be downloaded free of charge at University website [www.jooust.ac.ke](http://www.jooust.ac.ke) and **Public Procurement Information Portal [www.tenders.go.ke](http://www.tenders.go.ke)**. Tenderers who download the tender document and intend to submit a bid are required to submit their particulars to **JOOUST** through **Email: [proc@jooust.ac.ke](mailto:proc@jooust.ac.ke)** for the purpose of receiving any further clarification and/or addendum
- 1.3 **THERE SHALL BE A MANDATORY SITE VISIT TO BE HELD ON 9<sup>TH</sup> JULY 2020 FROM 10.00AM AT THE TUITION BLOCK SITE AT ACHIEGO**
- 1.4 Prices quoted should be net inclusive of all taxes, and delivery costs, must be in Kenya Shillings and shall remain valid for (120) days from the closing date of the tender.
- 1.5 Dully filled tender documents are to be enclosed in plain sealed envelopes, marked with the tender number, tender description **and bearing no indication of the applicant**, clearly /marking each “**ORIGINAL TENDER**” and “**COPY OF TENDER**” should be deposited in the tender box at Jaramogi Oginga Odinga University of Science and Technology or be addressed to:-

The Vice Chancellor,  
Jaramogi Oginga Odinga University of Science and Technology,  
P.O. Box 210-40601  
BONDO.

The tender documents should reach on or before **23<sup>rd</sup> July 2020**.

- 1.6 Due to Covid-19 the application documents will be opened on **5<sup>th</sup> August 2020** at the Assembly Hall, Main Campus in the presence of the candidates or their representatives who choose to attend

**NB: Due to Ministry of Health Instructions on social distancing the number of bidders/Representatives will be limited.**

- 1.7 **BIDDERS MUST SERIALIZE THE BID DOCUMENT.THE UNIVERSITY SHALL NOT BEAR RESPONSIBILITY FOR THE LOSS OF ANY DOCUMENT.**

## 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 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 undertake, if our tender is accepted, to commence the Works as soon as is reasonably possible after the receipt of the Project Manager's notice to commence, and to complete the whole of the Works comprised in the Contract within the time stated in the Appendix to Conditions of Contract.
3. 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.
4. Unless and until a formal Agreement is prepared and executed this tender together with your written acceptance thereof, shall constitute a binding Contract between us.
5. 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 Employer]

[Address of Employer]

Witness; Name \_\_\_\_\_

Address \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

## FORM OF TENDER SECURITY

Whereas ..... (Hereinafter called “the Tenderer”) has submitted his tender dated ..... for the construction of .....  
..... (Name of Contract)

Know all people by these presents that we .....  
having our registered office at ..... (Hereinafter called “the Bank”), are bound unto ..... (Hereinafter called “the Employer”) in the sum of KShs ....  
..... for which payment well and truly to be made to the said Employer, the Bank binds itself, its successors and assigns by these presents sealed with the Common Seal of the said Bank this ..... Day of .....20.....

The conditions of this obligation are:

1. If after tender opening the tenderer withdraws his tender during the period of tender validity specified in the instructions to tenderers  
Or
2. If the tenderer, having been notified of the acceptance of his tender by the Employer during the period of tender validity:
  - a. Fails or refuses to execute the form of Agreement in accordance with the Instructions to Tenderers, if required; or
  - b. Fails or refuses to furnish the Performance 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]

## SECTION II: INSTRUCTIONS TO TENDERERS

1. *General/Eligibility/Qualifications/Joint venture/Cost of tendering*
- 1.1. The Employer as defined in the Appendix to Conditions of Sub-Contract invites tenders for Sub- contract Works 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 Sub-Contractors) 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 Sub-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 Sub-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:
  - (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 the last three years;
  - (c) experience in works of similar nature and size for 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 Sub-Contracts;
  - (d) Major items of construction equipment proposed to carry out the Sub-Contract and an undertaking that they will be available for the Sub-Contract.
  - (e) Qualifications and experience of key site management and technical personnel proposed for the Sub-Contract and an undertaking that they shall be available for the Sub-Contract.
  - (f) Reports on the financial standing of the tenderer, such as profit and loss statements and auditor's reports for the past five years;

- (g) Evidence of adequacy of working capital for this Sub-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 Sub-Contracting components of the Works amounting to more than 10 percent of the Sub-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 Sub-Contract in accordance with the Sub-Contract terms;
  - (d) one of the partners will be nominated as being in charge, authorized to incur liabilities, and receive instructions for and on behalf of all partners of the joint venture; and
  - (e) The execution of the entire Sub-Contract, including payment, shall be done exclusively with the partner in charge.
- 1.7. To qualify for award of the Sub-Contract, tenderers shall meet the following minimum qualifying criteria;
- (a) Annual volume of construction work of at least 2.5 times the estimated annual cash flow for the Sub-Contract;
  - (b) Experience as a Sub-Contractor in the construction of at least Two works of similar nature and complexity to the proposed Works,
  - (c) Over the last 5 years (to comply with this requirement, works cited should be at least 70 percent complete);
  - (d) Proposals for the timely acquisition (own, lease, hire, etc.) of the essential equipment listed as required for the Works;
  - (e) A Sub-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
  - (f) Liquid assets and/or credit facilities, net of other contractual commitments and exclusive of any advance payments which may be made under the Sub-Contract, of no less than 4 months of the estimated payment flow under this Sub-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. Sub-Contractors' 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 Sub-Contractor 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 Sub-Contract for construction of the Works. The costs of visiting the Site shall be at the tenderer's own expense.
- 1.12. 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.

## **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) Invitation to tender
  - (b) Form of tender
  - (c) Form of tender security
  - (d) Instructions to tenderer.
  - (e) Tender evaluation criteria.
  - (f) Conditions of subcontract.
  - (g) Specifications of materials and works
  - (h) Bill of quantities
  - (i) Standard Forms
- 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 Sub-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 Sub-Contractor under the Sub-Contract, or for any other cause relevant to the Sub-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 Sub-Contract if provided for in the Appendix to Conditions of Sub-Contract and provisions made in the Conditions of Sub-Contract.
- 3.5. The unit rates and prices shall be in Kenya Shillings.
- 3.6. Tenders shall remain valid for a period of sixty (90) 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 invitation 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 G - 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. T h e 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. T h e Tender Security of the successful tenderer will be discharged when the tenderer has signed the Sub-Contract Agreement and furnished the required Performance Security.
- 3.12. T h e 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 designs 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 OF ORIGINAL". 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 organized 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 initialed 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 2 per cent of the tender price.

#### **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" of the original 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 Sub-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 deadlines 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 Sub-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; (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 Sub-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. Tenders determined to be substantially responsive will be checked for any arithmetic errors. Errors will be corrected as follows:

- (a) Where there is a discrepancy between the amount in figures and the amount in words, the amount in words will prevail; and
- (b) Where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will prevail, unless in the opinion of the Employer, there is an obvious typographical error, in which case the adjustment will be made to the entry containing that error.
- (c) In the event of a discrepancy between the tender amount as stated in the Form of Tender and the corrected tender figure in the main summary of the Bill of Quantities, the amount as stated in the Form of Tender shall prevail.
- (d) The Error Correction Factor shall be computed by expressing the difference between the tender amount and the corrected tender sum as a percentage of the corrected Builder's Work (i.e. Corrected tender sum less P.C. and Provisional Sums)
- (e) The Error Correction Factor shall be applied to all Builder's Work (as a rebate or addition as the case may be) for the purposes of valuations for Interim Certificates and valuation of variations.
- (f) The amount stated in the tender will be adjusted in accordance with the above procedure for the correction of errors and, with concurrence of the tenders, shall be considered as binding upon the tenderer. If the tenderer

does not accept the corrected amount, the tender may be rejected and the Tender Security may be forfeited in accordance with clause 3.11.

- 5.8. The Employer will evaluate and compare only the tenders determined to be substantially responsive in accordance with Clause 5.5.
- 5.9. In evaluating the tenders, the Employer will determine for each tender the evaluated tender price by adjusting the tender price as follows:
  - (a) Making any correction for errors pursuant to clause 5.7;
  - (b) excluding provisional sums and the provision, if any, for contingencies in the Bill of Quantities, but including Day works where priced competitively.
  - (c) Making an appropriate adjustment for any other acceptable variations, deviations, or alternative offers submitted in accordance with clause 3.12; and
  - (d) Making appropriate adjustments to reflect discounts or other price modifications offered in accordance with clause 4.6
- 5.10. 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.
- 5.11. 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 Sub-Contract is awarded. Any effort by the Tenderer to influence the Employer or his employees in his decision on tender evaluation, tender comparison or Sub-Contract award may result in the rejection of the tender.
- 5.12. 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 Sub-Contract Price excluding Provisional Sums to a non-indigenous Sub-Contractor
- 5.13. Where Sub-Contract price variation is allowed, the valuation shall not exceed 15% of the original Sub-Contract price.
- 5.14. Price variation request shall be processed by the procuring entity within 30 days of receiving the request.
- 5.15. The procuring entity may at any time terminate procurement proceedings before Sub-Contract award and shall not be liable to any person for the termination.
- 5.16. 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.

- 5.17. A tenderer who gives false information in the tender document about its qualification or who refuses to enter into a Sub-Contract after notification of Sub-Contract award shall be considered for debarment from participating in future public procurement.

## **6. *Award of Sub-Contract***

- 6.1. Subject to Clause 6.2, the award of the Sub-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 Sub-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 Sub-Contract documents called the “Letter of Acceptance”) will state the sum (hereinafter and in all Sub-Contract documents called the “Sub-Contract Price”) that the Employer will pay the Sub-Contractor in consideration of the execution, completion, and maintenance of the Works by the Sub-Contractor as prescribed by the Sub-Contract. At the same time the other tenderers shall be informed that their tenders have not been successful.
- 6.4. The Sub-Contract shall be formed on the parties signing the Sub-Contract.
- 6.5. 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.
- 6.6. 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 Sub-Contract and in the form stipulated in the Tender documents. The Performance Security shall be in the amount and specified form
- 6.7. 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.
- 6.8. 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.



- 6.9. Preference where allowed in the evaluation of tenders shall not be allowed for Sub-Contracts not exceeding one year (12 months)
- 6.10. The tender evaluation committee shall evaluate the tender within 30 days of the validity period from the date of opening the tender.
- 6.11. The parties to the Sub-Contract shall have it signed within 30 days from the date of notification of Sub-Contract award unless there is an administrative review request.
- 6.12. Sub-Contract price variations shall not be allowed for Sub-Contracts not exceeding one year (12 months)
- 6.13. Where Sub-Contract price variation is allowed, the valuation shall not exceed 15% of the original Sub-Contract price.
- 6.14. Price variation request shall be processed by the procuring entity within 30 days of receiving the request.
- 6.15. The procuring entity may at any time terminate procurement proceedings before Sub-Contract award and shall not be liable to any person for the termination.
- 6.16. 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.
- 6.17. A tenderer who gives false information in the tender document about its qualification or who refuses to enter into a Sub-Contract after notification of Sub-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 Sub-Contracts. A tenderer shall sign a declaration that he has not and will not be involved in corrupt and fraudulent practices.

### SECTION III: APPENDIX TO INSTRUCTIONS TO TENDERERS

INSTRUCTIONS TO TENDERERS	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERERS
1.1	The employer is the <b>Vice Chancellor</b> , Jaramogi Oginga Odinga University of Science and Technology.
1.7	Qualification criteria as set out in the tender evaluation criteria
1.8	N/A
1.9	Joint venture or individual tenderers only.
1.13	N/A
2.3	Or through email address: <a href="mailto:proc@jooust.ac.ke">proc@jooust.ac.ke</a>
3.2.(e)	N/A
3.4	N/A
3.6	Validity period of 90 days
3.8	Tender surety shall be valid for 30 days beyond the validity of tender from the date of tender opening.
3.12 (b)	N/A
3.14	One original and a copy of the original
3.18	Bid security of 2% OF THE TENDER SUM from a reputable bank recognized by the Central Bank of Kenya
5.2	Alternative bids not allowed
5.7	N/A: PPAD 2015 Applies
5.9	N/A
5.12	N/A
6.5	Successful tenderer to provide performance security of 10% of the Sub-Contract sum from reputable bank recognized by Central Bank of Kenya prior to Sub-Contract signing.
6.8	N/A
6.12	-The word “valuation” should read “variation” -Variation shall apply as prescribed by the <b>Public Procurement and Asset Disposal Act, 2015</b>
6.13	Shall be 60 days from the date of receipt of the request
8.0	Due diligence shall be conducted before award in accordance with the Public Procurement and Asset Disposal Act, 2015
9.0	Tenderer shall be required to provide litigation history which may be subjected to due diligence to ascertain the possibility of negatively affecting performance

## SECTION IV: TENDER EVALUATION CRITERIA

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

- i. Mandatory evaluation,
- ii. Technical Evaluation
- iii. Financial Evaluation; and
- iv. Due diligence

### 1. Preliminary evaluation

S/No	Mandatory requirement
1	Must provide National Construction Authority (NCA) Category 5 and above registration certificate under the category of mechanical installations. In the event of a joint venture, the certificate may be submitted by any one of the members of the venture.
2	Must provide Copy of current annual contractors practicing license from National Construction Authority (NCA). In the event of a joint venture, the certificate will be submitted by the holder of the NCA registration certificate.
3	Must provide Detailed Company profile.
4	Must provide certified copy of Certificate of Incorporation. If joint venture, ALL member of the venture shall submit their respective certificates.
5	Must attach proof of certified Company Ownership (CR12).
6	Must attach certified copy of Single Business Permit for the year 2020
7	Must provide valid Certificate of Tax Compliance from Kenya Revenue Authority; (certified copy). If joint venture, ALL member of the venture shall submit their respective certificates.
8	Must Dully fill, sign and stamp the Form of Tender.
9	Must attach Certified Audited financial reports prepared by registered Auditors for the last three consecutive years for the years ended 2017, 2018 and 2019.
10	Must Dully fill, sign and stamp the Confidential Business Questionnaire
11	Must Provide Dully filled, signed and stamped Non-Debarment Declaration Form.
12	Must Provide Dully signed and signed/stamped Litigation Declaration Form.)
13	Site visit/pre-tender conference is mandatory (as indicated in the advertisement)
14	Must provide a bid bond of 2% of the tender amount from a commercial bank recognized by CBK and must be valid for 120 days from the date of tender closing.
15	Must provide Manufacturers letter of Authority for the specified equipment
16	Must dully fill sign and stamp the Anti-corruption declaration form
17	Must Provide proof of Power of attorney of Tender Signatory in the event of a joint

Tender Document submitted without **ANY** of the above-mentioned Mandatory documents shall be rejected by the Jaramogi Oginga Odinga University of Science and Technology's Tender Evaluation Committee and will therefore not proceed to the technical and financial Evaluation.

**N.B** The employer may seek further clarification/confirmation if necessary, to confirm authenticity/compliance of any condition of the tender.

## 2. Technical evaluation

Award of points for the Technical Evaluation shall be as shown in Table 1 below:

Item	Description	Points Scored	Max Points	Total Points
1.	Key Personnel (Attach evidence)			25
	a) Project Engineer's qualification <ul style="list-style-type: none"> <li>• Holder of Degree ----- 5 marks</li> <li>• Holder of Diploma ----- 3marks</li> <li>• Holder of Certificate ----- 0 marks</li> </ul>		5	
	b) Project Engineer's experience <ul style="list-style-type: none"> <li>• Over ten (10) year relevant experience -- 5 marks</li> <li>• Five (5) to ten (10) years relevant experience ----- 4 marks</li> <li>• Under five (5) years relevant experience ---- 2 marks</li> <li>• No experience ----- 0 marks</li> </ul>		5	
	c) Works Inspector's Qualification <ul style="list-style-type: none"> <li>• Holder of Degree in relevant mechanical engineering --- ----- 5 marks</li> <li>• Holder of Diploma in mechanical engineering ----- 3 marks</li> <li>• Holder of Certificate in relevant engineering ----- 1 mark</li> <li>• No Qualification ----- 0 marks</li> </ul>		5	
	d) Works Inspector Experience <ul style="list-style-type: none"> <li>• Over 10 years' relevant experience----- 5 marks</li> <li>• Five (5) to ten (10) years' relevant experience ----- -- 3 marks</li> <li>• Under 5 years' relevant experience ----- 1 marks</li> <li>• No experience -----0 marks</li> </ul>		5	
	e) Experience of Technicians with minimum of certificate qualification in relevant construction /Engineering field <ul style="list-style-type: none"> <li>• Over 10 years' relevant experience ----- 5 marks</li> <li>• Five (5) to ten (10) relevant experience ----- 3marks</li> <li>• Under 5 years' relevant experience ----- 1mark</li> <li>• No relevant experience ----- 0 marks</li> </ul>		5	

Item	Description	Points Scored	Max Points	Total Points
2.	<p>Contracts completed in the last five (5) years; a max of 5 No. projects (Attach evidence in form of completion certificates or letters from clients/consultants.)</p> <ul style="list-style-type: none"> <li>• Project of similar nature, complexity and magnitude of equal or higher value. ----- 5 marks each</li> <li>• Project of similar nature and complexity but of lower magnitude than the one in consideration ----- 3 marks each</li> </ul> <p>No completed project of similar nature ---- 0 marks</p>		25	25
3	<p>On-going projects (A max of 2 No. projects) (Attach evidence; Letters of Award/ Interim certificates/ Contracts)</p> <ul style="list-style-type: none"> <li>• Project of similar nature, complexity and magnitude ----- 5 marks each</li> <li>• Project of similar nature, but of lower value than the one in consideration ----- 2.5 marks each</li> <li>• No ongoing project of similar nature ----- 0 marks</li> </ul>		10	10
5.	Evidence of business physical address. (Offices/Workshops). Provide copies of ownership or lease agreement documents.		5	5
6.	<p>Financial report</p> <p>Audited financial report (last three [3] years) - 2017-2019</p> <ul style="list-style-type: none"> <li>• Average Annual Turnover equal or higher than to Kshs. 40.0 Million ----- 15 Marks</li> <li>• Average Annual Turnover between Kshs. 20 Million and Kshs 39.9 Million ----- 10 Marks</li> <li>• Average Annual Turnover between Kshs. 10 Million and Kshs 19.9 Million ----- 5 Marks</li> <li>• Average Annual Turnover below Kshs 10 Million ----- 0 Marks</li> </ul>		15	15
7.	<p>Evidence of financial resources (cash in hand, lines of credit, overdraft facility etc.)</p> <ul style="list-style-type: none"> <li>• Amount equivalent to or above 25% of submitted tender sum ----- 20 Marks</li> <li>• Amount equivalent to 20% but below 25% of submitted tender sum ----- 15 Marks</li> <li>• Amount equivalent to 15% but below 20% of submitted tender sum ----- 10 Marks</li> <li>• Amount equivalent to 10% but below 15% of submitted tender sum ----- 5 Marks</li> <li>• Amount below 10% of submitted tender sum ----- 0 Mark</li> </ul>		20	20
	<b>TOTAL</b>			<b>100</b>

Any tenderer who scores 70 points and above in this Technical Evaluation shall be considered for further evaluation.

### **3. Financial Evaluation**

Only tenderer's who score 70% and above of the overall marks on the technical evaluation shall qualify for financial evaluation.

This will be carried out only for those tenders that have passed BOTH mandatory requirements and Technical evaluation. The client will;

1. Undertake price comparison and ranking of prices.
2. The prices shall be compared and checked for completeness including all local taxes.

### **4. Due Diligence and Recommendation for Award**

Particulars of post – qualification if applicable. The Client may inspect the premises due diligence to seek further clarification/confirmation if necessary, to confirm authenticity/compliance of any condition of the tender/qualifications of the tenderer in line with Section 83 of the Public Procurement and Asset Disposal Act, 2015.

The tenderer shall not be awarded the Sub-Contract if they fail to pass the compliance test. The second lowest tenderer shall be considered for due diligence.

Award Criteria: The firm achieving the lowest evaluated price will be awarded the Sub-Contract in line with Section 86 of the Public Procurement and Disposal Act, 2015

Particulars of performance security; 5% of Sub-Contract sum

## SECTION V: CONDITIONS OF SUB-CONTRACT

### 1. Definitions

- 1.1. In this Sub-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.

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

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

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

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

**“Defects Liability Period”** is the period named in the Sub-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 Sub-Contract.

**“Day works”** 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 Sub-Contractor to carry out the Works.

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

**“Intended Completion Date”** is the date on which it is intended that the Sub-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 Sub-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 Sub-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 Sub-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 Sub-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 Sub-Contract and any modification or addition made or approved by the Project Manager.

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

**“Sub-Contractor”** is a person or corporate body who has a Sub-Contract with the contractor to carry out a part of the Work in the contract, which includes Work on the Site.

**“Sub-Contract”** means the agreement entered into between the Employer and the Sub-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,

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

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

## **2. Interpretation**

- 2.1. In interpreting these Conditions of Sub-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 Sub-Contract.



- 2.2. If sectional completion is specified in the Appendix to Conditions of Sub-Contract, reference in the Conditions of Sub-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 Sub-Contract documents and shall be interpreted in the following order of priority;
- (1) Agreement,
  - (2) Letter of Acceptance,
  - (3) Sub-Contractor's Tender,
  - (4) Appendix to Conditions of Sub-Contract,
  - (5) Conditions of Sub-Contract,
  - (6) Specifications,
  - (7) Drawings,
  - (8) Bill of Quantities,
  - (9) Any other documents listed in the Appendix to Conditions of Sub-Contract as forming part of the Sub-Contract.

Immediately after the execution of the Sub-Contract, the Project Manager shall furnish both the Employer and the Sub-Contractor with two copies each of all the Sub-Contract documents. Further, as and when necessary the Project Manager shall furnish the Sub-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 Sub-Contract drawings or to enable the Sub-Contractor to carry out and complete the Works in accordance with these Conditions.

### **3. Language and Law**

- 3.1. Language of the Sub-Contract and the law governing the Sub-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 Sub-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 Sub-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.
- 6.2. The Sub-Contractor may Sub-Contract with the approval of the Project Manager, but may not assign the Sub-Contract without the approval of the Employer in writing. Sub-Contracting shall not alter the Sub-Contractor's obligations.

## **7. Other Sub-Contractors**

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

## **8. Personnel**

- 8.1. The Sub-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 Sub-Contractor to remove a person who is a member of the Sub-Contractor's staff or work force, stating the reasons, the Sub-Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the Work in the Sub-Contract.

## **9. Works**

- 9.1. The Sub-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 Sub-Contractor, as updated with the approval of the Project Manager, and complete them by the Intended Completion Date.

## **10. Safety and Temporary Works**

- 10.1. The Sub-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.

- 10.2. The Project Manager's approval shall not alter the Sub-Contractor's responsibility for design of the Temporary works and all drawings prepared by the Sub-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.
- 10.3. The Sub-Contractor shall be responsible for the safety of all activities on the Site.

## **11. Discoveries**

- 11.1. 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.

## **12. Work Program**

- 12.1. Within the time stated in the Appendix to Conditions of Sub-Contract, the Sub-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.
- 12.2. The Sub-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 Sub-Contract. If the Sub-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 Sub-Contractor's obligations.
- 12.3. The Sub-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.

## **13. Possession of Site**

- 13.1. The Employer shall give possession of all parts of the Site to the Sub-Sub-Contractor. If possession of a part is not given by the date stated in the Appendix to Conditions of Sub-Contract, the Employer will be deemed to have

delayed the start of the relevant activities, and this will be a Compensation Event.

**14. Access to Site**

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

**15. Instructions**

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

**16. Extension or Acceleration of Completion Date**

- 16.1. 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 Sub-Contractor taking steps to accelerate the remaining Work, which would cause the Sub-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 Sub-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 Sub-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.
- 16.2. No bonus for early completion of the Works shall be paid to the Sub-Contractor by the Employer.

**17. Management Meetings**

- 17.1. A Sub-Contract management meeting shall be held monthly and attended by the Project Manager and the Sub-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.

**18. Early Warning**

- 18.1. The Sub-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 Sub-Contract Price or delay the execution of the Works. The Project Manager may require the Sub-Contractor to provide an estimate of the expected effect of the future event or circumstance on the Sub-Contract Price and Completion Date. The estimate shall be provided by the Sub-Contractor as soon as reasonably possible.

- 18.2. The Sub-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.

## **19. Defects**

- 19.1. The Project Manager shall inspect the Sub-Contractor's work and notify the Sub-Contractor of any defects that are found. Such inspection shall not affect the Sub-Contractor's responsibilities. The Project Manager may instruct the Sub-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 Sub-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 Sub-Contract Price.
- 19.2. The Project Manager shall give notice to the Sub-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 Sub-Contract. The Defects Liability Period shall be extended for as long as defects remain to be corrected.
- 19.3. Every time notice of a defect is given, the Sub-Contractor shall correct the notified defect within the length of time specified by the Project Manager's notice. If the Sub-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 Sub-Contract Price.

## **20. Bills of Quantities**

- 20.1. The Bills of Quantities shall contain items for the construction, installation, testing and commissioning of the Work to be done by the Sub-Contractor. The Sub-Contractor will be paid for the quantity of the Work done at the rate in the Bills of Quantities for each item.
- 20.2. 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 Sub-Contract price, the Project Manager shall adjust the rate to allow for the change.

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

## **21. Variations**

- 21.1. All variations shall be included in updated programs produced by the Sub-Contractor.
- 21.2. The Sub-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
- 21.3. 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 Sub-Contractor shall be in the form of new rates for the relevant items of Work.
- 21.4. If the Sub-Contractor's quotation is unreasonable, the Project Manager may order the variation and make a change to the Sub-Contract price, which shall be based on the Project Manager's own forecast of the effects of the variation on the Sub-Contractor's costs.
- 21.5. 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.
- 21.6. The Sub-Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning.
- 21.7. When the Program is updated, the Sub-Contractor shall provide the Project Manager with an updated cash flow forecast.

## **22. Payment Certificates, Currency of Payments and Advance Payments**

- 22.1. The Sub-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 Sub-Contractor considers himself to be entitled to. The Project Manager shall check the monthly application and certify the amount to be paid to the Sub-Contractor within 14 days. The value of Work executed and payable shall be determined by the Project Manager.

- 22.2. 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 Sub-Contractor for their value. Thereafter, they shall not be removed from Site without the Project Manager's instructions except for use upon the Works.
- 22.3. Payments shall be adjusted for deductions for retention. The Employer shall pay the Sub-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 Sub-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.
- 22.4. If an amount certified is increased in a later certificate or as a result of an award by an Arbitrator, the Sub-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.
- 22.5. 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 Sub-Contract.
- 22.6. The Sub-Contract Price shall be stated in Kenya Shillings. All payments to the Sub-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 Sub-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 Sub-Contract.

If the Sub-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 Sub-Contractor of any changes in the expected foreign currency requirements of the Sub-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 Sub-Contract Price shall then be amended by agreement between Employer and the Sub-Contractor in order to reflect appropriately such changes.

- 22.7. In the event that an advance payment is granted, the following:
- (a) On signature of the Sub-Contract, the Sub-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 Sub-Contract. The advance shall not be subject to retention money.

- (b) No advance payment may be made before the Sub-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 Sub-Contractor. Reimbursement shall begin when the amount of the sums due under the Sub-Contract reaches 20% of the original amount of the Sub-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:

$X^1$  = the amount of proposed cumulative payments as a percentage of the original amount of the Sub-Contract. This figure will exceed 20% but not exceed 80%.

$X^{11}$  = the amount of the previous cumulative payments as a percentage of the original amount of the Sub-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.

## **23. Compensation Events**

23.1. 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 Sub-Contract.
- (b) The Employer modifies the List of Other Sub-Contractors, etc., in a way that affects the Work of the Sub-Sub-Contractor under the Sub-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 Sub-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 Sub-Contract 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 Sub-Contractors, public authorities, utilities, or the Employer does not work within the dates and other constraints stated in the Sub-Contract, and they cause delay or extra cost to the Sub-Contractor.
  - (i) The effects on the Sub-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 Sub-Contract or determined by the Project Manager shall apply.
- 23.2. If a compensation event would cause additional cost or would prevent the Work being completed before the Intended Completion Date, the Sub-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 Sub-Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.
- 23.3. As soon as information demonstrating the effect of each compensation event upon the Sub-Contractor's forecast cost has been provided by the Sub-Contractor, it shall be assessed by the Project Manager, and the Sub-Contract Price shall be adjusted accordingly. If the Sub-Contractor's forecast is deemed unreasonable, the Project Manager shall adjust the Sub-Contract Price based on the Project Manager's own forecast. The Project Manager will assume that the Sub-Contractor will react competently and promptly to the event.
- 23.4. The Sub-Contractor shall not be entitled to compensation to the extent that the Employer's interests are adversely affected by the Sub-Contractor not having given early warning or not having co-operated with the Project Manager.
- 23.5. Prices shall be adjusted for fluctuations in the cost of inputs only if provided for in the Appendix to Conditions of Sub-Contract.

- 23.6. The Sub-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.
- 23.7. Provided always that should the event giving rise to the claim of continuing effect, the Sub-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.

#### **24. Price Adjustment**

- 24.1. The Project Manager shall adjust the Sub-Contract Price if taxes, duties and other levies are changed between the date 30 days before the submission of tenders for the Sub-Contract and the date of Completion. The adjustment shall be the change in the amount of tax payable by the Sub-Contractor.
- 24.2. The Sub-Contract Price shall be deemed to be based on exchange rates current at the date of tender submission in calculating the cost to the Sub-Contractor of materials to be specifically imported (by express provisions in the Sub-Contract Bills of Quantities or Specifications) for permanent incorporation in the Works. Unless otherwise stated in the Sub-Contract, if at any time during the period of the Sub-Contract exchange rates shall be varied and this shall affect the cost to the Sub-Sub-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 Sub-Contract price.
- 24.3. Unless otherwise stated in the Sub-Contract, the Sub-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 Sub-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 (JBC) 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 Sub-Contractor in his pricing shall be attached in the Appendix to Conditions of Sub-Contract.
  - (ii) Upon JBC determining that any of the said rates of wages or other emoluments and expenses are increased or decreased, then the Sub-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 JBC 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.

- 24.4. The prices contained in the Sub-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 JBC 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 Sub-Contractor in his pricing shall be attached in the Appendix to Conditions of Sub-Contract.
- 24.5. Upon the JBC determining that any of the said basic prices are increased or decreased then the Sub-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 JBC 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.
- 24.6. 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.
- 24.7. 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.

## **25. Retention**

- 25.1. The Employer shall retain from each payment due to the Sub-Contractor the proportion stated in the Appendix to Conditions of Sub-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 Sub-Contractor and the remaining half when the Defects Liability Period has passed and the Project Manager has certified that all defects notified to the Sub-Contractor before the end of this period have been corrected.

## **26. Liquidated Damages**

- 26.1. The Sub-Contractor shall pay liquidated damages to the Employer at the rate stated in the Appendix to Conditions of Sub-Contract for each day that the actual Completion Date is later than the Intended Completion

- 26.2. Date. The Employer may deduct liquidated damages from payments due to the Sub-Contractor. Payment of liquidated damages shall not alter the Sub-Contractor's liabilities.
- 26.3. 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 Sub-Contractor by adjusting the next payment certificate. The Sub-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

## **27. Securities**

- 27.1. 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.

## **28. Dayworks**

- 28.1. If applicable, the Dayworks rates in the Sub-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.
- 28.2. All work to be paid for as Dayworks shall be recorded by the Sub-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.
- 28.3. The Sub-Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.

## **29. Liability and Insurance**

- 29.1. 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 Sub-Contracted to him except the Sub-Sub-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.

29.2. 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 Sub-Contractor on the Site after the Completion Date.

29.3. 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 Sub-contractor's risks.

The Sub-Contractor shall provide, in the joint names of the Employer and the Sub-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 Sub-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 Sub-Contract, and
- (d) Personal injury or death.

29.4. Policies and certificates for insurance shall be delivered by the Sub-Sub-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.

29.5. If the Sub-Contractor does not provide any of the policies and certificates required, the Employer may affect the insurance which the Sub-Contractor should have provided and recover the premiums from payments otherwise due to the Sub-Contractor or, if no payment is due, the payment of the premiums shall be a debt due.

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

### **30. Completion and taking over**

30.1. Upon deciding that the Works are complete, the Sub-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.

### **31. Final Account**

- 31.1. The Sub-Contractor shall issue the Project Manager with a detailed account of the total amount that the Sub-Contractor considers payable to him by the Employer under the Sub-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 Sub-Contractor within 30 days of receiving the Sub-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 Sub-Contractor and issue a Payment Certificate. The Employer shall pay the Sub-Contractor the amount due in the Final Certificate within 60 days.

### **32. Termination**

- 32.1. The Employer or the Sub-Contractor may terminate the Sub-Contract if the other party causes a fundamental breach of the Sub-Contract. These fundamental breaches of Sub-Contract shall include, but shall not be limited to, the following;
- (a) The Sub-Contractor stops work for 30 days when no stoppage of work is shown on the current program and the stoppage has not been authorized by the Project Manager;
  - (b) The Project Manager instructs the Sub-Contractor to delay the progress of the Works, and the instruction is not withdrawn within 30 days;
  - (c) The Sub-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 Sub-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 Sub-Contract and the Sub-Contractor fails to correct it within a reasonable period of time determined by the Project Manager;
  - (f) The Sub-Contractor does not maintain a security, which is required.
- 32.2. When either party to the Sub-Contract gives notice of a breach of Sub-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.
- 32.3. Notwithstanding the above, the Employer may terminate the Sub-Contract for convenience.

- 32.4. If the Sub-Contract is terminated, the Sub-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.

**33. Payment upon Termination**

- 33.1. If the Sub-Contract is terminated because of a fundamental breach of Sub-Contract by the Sub-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 Sub-Contractor, the difference shall be a debt payable by the Sub-Contractor.
- 33.2. If the Sub-Contract is terminated for the Employer's convenience or because of a fundamental breach of Sub-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 Sub-Contractor's personnel employed solely on the Works, and the Sub-Contractor's costs of protecting and securing the Works.
- 33.3. 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.
- 33.4. The Sub-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 Sub-Contractor, holding the proceeds less all costs incurred to the credit of the Sub-Contractor.

Until after completion of the Works under this clause the Employer shall not be bound by any other provision of this Sub-Contract to make any payment to the Sub-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 Sub-Contractor before such determination exceeds the total amount which would have been payable on due completion in accordance with this Sub-Contract the difference shall be a debt payable to the Employer by the Sub-Sub-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 Sub-Contractor.

**34. Release from Performance**

- 34.1. If the Sub-Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer or the Sub-Contractor, the Project Manager shall certify that the Sub-Contract has been frustrated. The Sub-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.

**35. Corrupt gifts and payments of commission**

- 35.1. The Sub-Contractor shall not;

- (a) Offer or give or agree to give to any person in the service of the
- (b) 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 Sub-Contract for the Employer or for showing or forbearing to show favor or disfavor to any person in relation to this or any other Sub-Contract for the Employer.
- (c) Enter into this or any other Sub-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 Sub-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 Sub-Contractor or by anyone employed by him or acting on his behalf (whether with or without the knowledge of the Sub-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.

**36. Settlement of Disputes**

- 36.1. In case any dispute or difference shall arise between the Employer or the Project Manager on his behalf and the Sub-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

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

- 36.2. The arbitration may be on the construction of this Sub-Contract or on any matter or thing of whatsoever nature arising thereunder or in connection therewith, including any matter or thing left by this Sub-Contract to the discretion of the Project Manager, or the withholding by the Project Manager of any certificate to which the Sub-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 Sub-Contract.
- 36.3. 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.
- 36.4. 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.
- 36.5. 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 Sub-Contract by either party:
  - (a) The appointment of a replacement Project Manager upon the said person ceasing to act.
  - (b) Whether or not the issue of an instruction by the Project Manager is empowered by these Conditions
  - (c) Whether or not a certificate has been improperly withheld or is not in accordance with these Conditions.
  - (d) Any dispute or difference arising in respect of war risks or war damage.
- 36.6. 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 Sub-Contract, unless the Employer and the Sub-Contractor agree otherwise in writing.

- 36.7. 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.
- 36.8. 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.
- 36.9. The award of such Arbitrator shall be final and binding upon the parties.

**37. Alternative Dispute Resolution**

- 37.1. Pursuant to clause 37 of these Conditions of Sub-Contract, it shall be a condition that no dispute shall be referred to arbitration unless and until the matter has been dealt with through Alternative Dispute Resolution (ADR) mechanism.
- 37.2. The person or persons to conduct the Alternative Resolution shall be agreed upon between the parties
- 37.3. The Alternative Dispute Resolution shall involve Reconciliation, Mediation or Adjudication.

## SECTION VI – APPENDIX TO CONDITIONS OF SUB-CONTRACT

<p>THE PROJECT MANAGER IS</p> <p>Name: .....</p> <p>Address: .....</p> <p>Telephone: .....</p> <p>Facsimile: .....</p>	
<p>The name (and identification number) of the Sub-Contract PROPOSED CONSTRUCTION OF TUITION COMPLEX AT ACHIEGO CAMPUS</p> <p>The Works consist of: <b>PLUMBING,DRAINAGE AND FIRE FIGHTING,GROUND WATER TANKS,POTABLE WATER SUPPLY,WASTE WATER TREATMENT PLANT FOR TUITION COMPLEX AT JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY, ACHIEGO CAMPUS</b></p> <p>TENDER No. ....</p>	
<p>Other Sub-Contractors, utilities etc. to be engaged by the Employer on the site include those for the execution of;</p> <p><b>NONE</b></p>	Clause 8.1
<p>The Start Date shall be <b>AGREED WITH THE CLIENT</b></p> <p>The Intended Completion Date for the whole of the Works shall be <b>AGREED WITH THE CLIENT</b></p> <p>The Sub-Contractor shall submit a program for the Works within 14 days of delivery of the Letter of Acceptance.</p>	Clause 10
<p>The period between Program updates is 14 days.</p> <p>The amount to be withheld for late submission of an updated Program is <b>WHOLE CERTIFICATE</b></p>	Clause 13
<p>The Site Possession <b>Date shall be AGREED WITH THE CLIENT</b></p> <p>The Site is located at <b>JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY, ACHIEGO CAMPUS</b></p>	Clause 14
<p>The Defects Liability period is <b>6 Months</b>.</p>	Clause 20
<p>Variations shall be in accordance with the Public Procurement and Asset Disposal Act (2015)</p>	Clause 22
<p>The payments shall be settled within 45 days from the date of receipt of the interim certificates by the Client</p>	Clause 23.1
<p>There shall be no payment on delayed payments</p>	Clause 23.3
<p>All payments shall be made in Kenya Shillings</p>	Clause 23.6
<p>There shall be no payment in advance</p>	Clause 23.7
<p>Not Applicable</p>	Clause 25
<p>The proportion of payments retained is 10 percent.</p>	Clause 26

The liquidated damages for the whole of the Works is Kshs. 200,000.00 per week or part thereof	Clause 27.1
The Performance Security shall be five percent (5%) of the Sub-Contract sum from a reputable bank recognized by the Central Bank of Kenya	Clause 28
The minimum insurance covers shall be;	Clause 30
<ol style="list-style-type: none"> <li>1. The minimum cover for insurance of the Works and of Plant and Materials in respect of the Sub-Sub-Contractor's liability is Sub-Contractors All Risk Policy</li> <li>2. The minimum cover for loss or damage to Equipment is NIL</li> <li>3. Insurance to cover third party risks</li> <li>4. The minimum for insurance of other property is KShs. 1,000,000.00</li> <li>5. The minimum cover for personal injury or death insurance <ul style="list-style-type: none"> <li>• For the Sub-Contractor's employees is AS PER LAWS APPLICABLE</li> <li>• And for other people is AS PER LAWS APPLICABLE</li> </ul> </li> </ol>	
<p>The Completion Period for the Works is 12 Months.</p> <p>The schedule of basic rates used in pricing by the Sub-Contractor is as attached</p> <p>[SUB-CONTRACTOR TO ATTACH].</p>	Clause 31
<p>Disputes to be settled as per the Arbitration Laws of Kenya</p> <p>Any dispute arising out of the Sub-Contract that cannot be amicably resolved between the parties shall be referred by either party to the arbitration and a final decision by a panel of a person to be agreed between the parties. Failing agreement on the appointment of an Arbitrator, the Arbitrator shall be appointed by the chairperson of the Chartered Institute of Arbitrators –Kenya branch on the request of the applying party. The seat of arbitration shall be in Kenya.</p>	Clause 37.1

**SECTION VII**  
**SUB-CONTRACT PRELIMINARIES**  
**AND**  
**GENERAL CONDITIONS**

## **SUB-CONTRACT PRELIMINARIES AND GENERAL CONDITIONS**

### **1.1. Examination of Tender Documents**

The tenderer is required to check the number of pages of this document and should he find any missing or indistinct, he must inform the Engineer at once and have the same rectified.

All tenderers shall be deemed to have carefully examined the following:

- (a) Work detailed in the Specification and in the Sub-Contract Drawings.
- (b) The Republic of Kenya Document "General Conditions of Sub-Contract for Electrical and Mechanical Works".
- (c) Other documents to which reference is made.

The tenderer shall also be deemed to have included for any expenditure which may be incurred in conforming with the above items (a), (b), (c) and observe this expense as being attached to the Sub-Contract placed for the whole or any part of the work.

The tenderer shall ensure that all ambiguities, doubts or obscure points of detail, are clarified with the Engineer before submission of his tender, as no claims for alleged deficiencies in the information given shall be considered after this date.

### **1.2. Discrepancies**

The Sub-Contractor shall include all work either shown on the Sub-Contract Drawings or detailed in the specification. No claim or extra cost shall be considered for works which has been shown on the drawings or in the specification alone.

Should the drawing and the specification appear to conflict, the Sub-Contractor shall query the points at the time of tendering and satisfy himself that he has included for the work intended, as no claim for extra payment on this account shall be considered after the Sub-Contract is awarded.

### **1.3. Conditions of Sub-Contract Agreement**

The Sub-Contractor shall be required to enter into a Sub-Contract with the Main Contractor.

The Conditions of the Sub-Contract between the Main Contractor and the Sub-Contractor as hereinafter defined shall be the latest edition of the Agreement and Schedule of Conditions of Kenya Association of Building and Civil Engineering Contractors as particularly modified and amended hereinafter.

For the purpose of this Sub-Contract the Agreement and Schedule of Conditions and any such modifications and amendments shall read and construed together. In any event of discrepancy the modifications and amendments shall prevail.

#### **1.4. Payment**

Payment will be made through certificates to the Main Contractor, unless he specifically agrees to forego this right, in which case direct payment can be made to the Sub-Contractor. All payments will be less retention as specified in the Main contract. No payment will become due until materials are delivered to site.

#### **1.5. Definition of Terms**

Throughout these Sub-Contract documents units of measurements, terms and expressions are abbreviated and wherever used hereinafter and in all other documents they shall be interpreted as follows:

- (i) Employer: The term “Employer” shall mean  
The Vice Chancellor, Jaramogi Oginga Odinga University of Science and Technology,  
P.O. Box 210 – 40601 BONDO
- (ii) Architect: The Term “Architect” Shall Mean  
Heritage Associates Limited  
P.O Box 56293- 00200 - NAIROBI.
- (iii) Project Manager: The term Project Manager shall Mean:  
Heritage Associates Limited  
P.O Box 56293- 00200 - NAIROBI.
- (iv) Quantity Surveyor: The term “Quantity Surveyor” shall mean  
Cost Bill Systems Limited  
P.O Box 5593-00100- NAIROBI.
- (v) Civil/Structural Engineers: The term “Civil/Structural Engineers” shall mean  
Wastruct Consultants Limited  
P.O Box 51288 – 00200 - NAIROBI.
- (vi) Engineer: The term “engineer” shall mean  
M&E Consulting Engineers  
P.O Box 50744-00200- NAIROBI.

- (vii) Main Contractor: The term “Main Contractor” shall mean  
The firm or company appointed to carry out the Building Works and shall include his or their heir, executors, assigns, administrators, successors, and Duly appointed representatives.
- (viii) Sub-Contractor: The term “Sub-Contractor” shall mean the persons or person, firm or Company whose tender for this work has been accepted, and who has entered into a Sub-Contract agreement with the Main Contractor for the execution of the Sub-Contract Works, and shall include his or their heirs, executors, administrators, assigns, successors and duly appointed representatives.
- (ix) Sub-Contract Works: The term “Sub-Contract Works” shall mean all or any portion of the work, materials and articles, whether the same are being manufactured or prepared, which are to be used in the execution of this Sub-Contract and whether the same may be on site or not.
- (x) Sub-Contract Drawings: The term “Sub-Contract Drawings” shall mean those drawings required or referred to herein and forming part of the Bills of Quantities.
- (xi) Working Drawings: The term “Working Drawings” shall mean those drawings required to be prepared by the Sub-Contractor as hereinafter described.
- (xii) Record Drawings: The term “Record Drawings” shall mean those drawings required to be prepared by the Sub-Contractor showing “as installed” and other records for the Sub-Contract Works.
- (xiii) Abbreviations:
- CM shall mean Cubic Metre
- SM shall mean Square Metre
- LM shall mean Linear Metre
- LS shall mean Lump Sum
- mm shall mean Millimetres
- No. shall mean Number
- kg. shall mean Kilogramme
- KEBS or KBS shall mean Kenya Bureau of Standards



BS shall mean. Current standard British Standard Specification published by the British Standard Institution, 2 Park Street, London W1, England

SWG shall mean standard wire gauge

“Ditto” shall mean the whole of the preceding description in which it occurs. Where it occurs in description of succeeding item it shall mean the same as in the first description of the series in which it occurs except as qualified in the description concerned. Where it occurs in brackets it shall mean the whole of the preceding description which is contained within the appropriate brackets.

#### **1.6. Site Location**

The site of the Sub-Contract Works is situated at Jaramogi Oginga Odinga University-Achiego Campus

The tenderer is recommended to visit the site and shall be deemed to have satisfied himself with regard to access, possible conditions, the risk of injury or damage to property on/or adjacent to the site, and the conditions under which the Sub-Contract Works shall have to be carried out and no claims for extras will be considered on account of lack of knowledge in this respect.

#### **1.7. Duration of Sub-Contract**

The Sub-Contractor shall be required to phase his work in accordance with the Main Contractor's program (or its revision). The program is to be agreed with the Main Contractor.

#### **1.8. Scope of Sub-Contract Works**

The Sub-Contractor shall supply, deliver, unload, hoist, fix, test, commission and handover in a satisfactory working order the complete installation detailed in the Specification and accompanying drawings, including all items of plant and equipment other than those clearly stated to be supplied and installed under other contracts. The Sub-Contractor shall supply all accessories, whether described in this Specification or not, essential to the completion of the work to the satisfaction of the Engineer and in accordance with all local and Government Regulations.

The Sub-Contractor shall be responsible for receiving of items or equipment supplied by the Main Contractor but to be fixed and commissioned under this Sub-Contract.

#### **1.9. Extent of the Sub-Contractor's Duties**

At the commencement of the works, the Sub-Contractor shall investigate and report to the Engineer if all materials and equipment to be used in the work

and not specified as supplied by the others are available locally. If these materials and equipment are not available locally, the Sub-Contractor shall at this stage place orders for the materials in question and copy the orders to the Engineer. Failure to do so shall in no way relieve the Sub-Contractor from supplying the specified materials and equipment in time.

For the purpose of this Contract the Agreement and Schedule of Conditions and any such modifications and amendments shall be read and construed together. In the event of discrepancy, the modifications and amendments shall prevail.

Materials supplied by others for installation and/or connection by the Sub-Contractor shall be carefully examined in the presence of the supplier before installation and connection. Any defects noted shall immediately be reported to the Engineer.

The Sub-Contractor shall be responsible for verifying all dimensions relative to his work by actual measurements taken on site.

The Sub-Contractor shall mark accurately on one set of drawings and indicate all alterations and/or modifications carried out to the designed system during the construction period. This information must be made available on site for inspection by the Engineer.

#### **1.10. Execution of the Works**

The works shall be carried out strictly in accordance with:

- (a) All relevant Kenya Bureau of Standards Specifications.
- (b) All relevant British Standard Specifications and Codes of Practice (hereinafter referred to as BS and CP respectively).
- (c) This Specification.
- (d) The Sub-Contract Drawings.
- (e) The Bye-laws of the Local Authority and the Electricity Supply Authority.
- (f) The Architect's and/or Engineer's Instructions.

The Sub-Contract Drawings and Specifications to be read and construed together.

#### **1.11. Validity of Tender**

The tender shall remain valid for acceptance within 90 days from the final date of submission of the tender, and this has to be confirmed by signing the Tender Bond. The tenderer shall be exempted from this Bond if the tender was previously withdrawn in writing to the Employer before the official opening.

#### **1.12. Firm – Price Sub-Contract**

Unless specifically stated in the documents or the invitation to tender, this is a firm-price Sub-Contract and the Sub-Contractor must allow in his tender for the increase in the cost of labour and/or materials during the duration of the Sub-Contract. No claims will be allowed for increased costs arising from the fluctuations in duties and/or day to day currency fluctuations. The Sub-Contractor will be deemed to have allowed in his tender for any increase in the cost of materials which may arise as a result of currency fluctuation during the Sub-Contract period.

#### **1.13. Variations**

No alteration to the Sub-Contract Works shall be carried out until receipt by the Sub-Contractor of written instructions from the Project Manager.

Any variation from the Sub-Contract price in respect of any extra work, alteration or omission requested or sanctioned by the Architect or Engineer shall be agreed and confirmed in writing at the same time such variations are decided and shall not affect the validity of the Sub-Contract. Schedule of Unit Rates shall be used to assess the value of such variations. No allowance shall be made for loss of profit on omitted works.

Where the Architect requires additional work to be performed, the Sub-Contractor, if he considers it necessary, will give notice within seven (7) days to the Main Contractor of the length of time he (the Sub-Contractor) requires over and above that allotted for completion of the Sub-Contract. If the Sub-Contractor fails to give such notice he will be deemed responsible for the claims arising from the delay occasioned by reason of such extension of time.

#### **1.14. Prime Cost and Provisional Sums**

A specialist Sub-Contractor may be nominated by the Architect to supply and/or install any equipment covered by the Prime Cost or Provisional Sums contained within the Sub-Contract documents.

The work covered by Prime Cost and Provisional Sums may or may not be carried out at the discretion of the Architect.

The whole or any part of these sums utilised by the Sub-Contractor shall be deducted from the value of the Sub-Contract price when calculating the final account.

#### **1.15. Bond**

The tenderer must submit with his tender the name of one Surety who must be an established Bank only who will be willing to be bound to the Main Contractor for an amount equal to 7½ % of the Sub-Contract amount.

#### **1.16. Government Legislation and Regulations**

The Sub-Contractor's attention is called to the provision of the Factory Act 1972 and subsequent amendments and revisions, and allowance must be made in his tender for compliance therewith, in so far as they are applicable.

The Sub-Contractor must also make himself acquainted with current legislation and any Government regulations regarding the movement, housing, security and control of labour, labour camps, passes for transport, etc.

The Sub-Contractor shall allow for providing holidays and transport for work people, and for complying with Legislation, Regulations and Union Agreements.

#### **1.17. Import Duty and Value Added Tax**

The Sub-Contractor will be required to pay full Import Duty and Value Added Tax on all items of equipment, fittings and plant, whether imported or locally manufactured. The tenderer shall make full allowance in his tender for all such taxes.

#### **1.18. Insurance Company Fees**

Attention is drawn to the tenderers to allow for all necessary fees, where known, that may be payable in respect of any fees imposed by Insurance Companies or statutory authorities for testing or inspection.

No allowance shall be made to the Sub-Contractor with respect to fees should these have been omitted by the tenderer due to his negligence in this respect.

#### **1.19. Provision of Services by the Main Contractor**

The Main Contractor shall make the following facilities available to the Sub-Contractor:

- (a) Attendance on the Sub-Contractor and the carrying out of all work affecting the structure of the building which may be necessary, including all chasing, cutting away and making good brickwork, etc., except that all plugging for fixing, fittings, machinery, fan ducting, etc., and all drilling and tapping of steel work shall be the responsibility of the Sub-Contractor. Any purpose made fixing brackets shall not constitute Builder's Work and shall be provided and installed by the Sub-Contractor unless stated hereinafter otherwise.
- (b) The provision of temporary water, lighting and power: All these services utilised shall be paid for by the Main Contractor. The Sub-Contractor shall, however, allow for additional connections/extensions required for his purposes.

- (c) Fixing of anchorage and pipe supports in the shuttering, except that all anchorage shall be supplied by the Sub-Contractor who shall also supply the Main Contractor with fully dimensioned drawings detailing the exact locations.
- (d) (i) Provision of scaffolding, cranes, etc. but only in so far as it is required for the Main contract Works. It shall be the Sub-Contractor's responsibility to liaise with the Main Contractor to ensure that there is maximum co-operation with other Sub-Contractors in the use of scaffolding, cranes, etc.  
(ii) Any specialist scaffolding, cranes, etc. by the Sub-Contractor for his own exclusive use shall be paid for by the Sub-Contractor.

#### **1.20. Suppliers**

The Sub-Contractor shall submit names of any supplier for the materials to be incorporated, to the Engineer for approval. The information regarding the names of the suppliers may be submitted at different times, as may be convenient, but no sources of supply will be changed without prior approval.

Each supplier must be willing to admit the Engineer or his representative to his premises during working hours for the purpose of examining or obtaining samples of the materials in question.

#### **1.21. Samples and Materials Generally**

The Sub-Contractor shall, when required, provide for approval at no extra cost, samples of all materials to be incorporated in the works. Such samples, when approved, shall be retained by the Engineer and shall form the standard for all such materials incorporated.

No materials of any description shall be used or delivered to site without prior sanction by the Engineer, and any condemned material as unfit for use in the Works, must be removed immediately from the site without any recompense to the Sub-Contractor.

All materials for the permanent works shall be new and shall, where no other specification is given, be of first class quality and suitable for the purpose intended.

#### **1.22. Administrative Procedure and Sub-Contractual Responsibility**

Wherever within the Specification it is mentioned or implied that the Sub-Contractor shall deal direct with the Employer or Engineer, it shall mean "through the contractor" who is responsible to the Employer for the whole of the works including the Sub-Contract Works.

#### **1.23. Bills of Quantities**

The Bills of Quantities have been prepared in accordance with the standard method of measurement of Building Works for East Africa, first Edition, Metric, 1970. All the Quantities are based on the contract Drawings and are provisional and they shall not be held to gauge or to limit the amount or description of the work to be executed by the Sub-Contractor but the value thereof shall be deducted from the -contract Sum and the value of the work ordered by the Engineer and executed thereunder shall be measured and valued by the Engineer in accordance with the conditions of the Sub-contract.

All work liable to adjustment under this Sub-Contract shall be left uncovered for a reasonable time to allow measurements needed for such adjustment to be taken by the Quantity Surveyor or Engineer. Immediately the work is ready for measuring the Sub-Contractor shall give notice to the Quantity Surveyor or Engineer to carry out measurements before covering up. If the Sub-Contractor shall make default in these respects he shall, if the Architect so directs, uncover the work to enable the necessary measurements to be taken and afterwards reinstate at his own expense.

#### **1.24. Sub-Contractor's Office in Kenya**

The Sub-Contractor shall maintain (after first establishing if necessary) in Kenya an office staffed with competent Engineer Manager and such supporting technical and clerical staff as necessary to control and coordinate the execution and completion of the Sub-Contract Works.

The Engineer Manager and his staff shall be empowered by the Sub-Contractor to represent him at meetings and in discussions with the Main Contractor, the Engineer and other parties who may be concerned and any liaison with the Sub-Contractor's Head Office on matters relating to the design, execution and completion of the Sub- contract Works shall be effected through his office in Kenya.

It shall be the Sub-Contractor's responsibility to procure work permits, entry permits, licences, registration, etc., in respect of all expatriate staff.

The Sub-Contractor shall prepare a substantial proportion of his Working Drawings at his office in Kenya. No reasons for delays in the preparation or submission for approval or otherwise of such drawings or proposals will be accepted on the grounds that the Sub-Contractor's Head Office is remote from his office in Nairobi or the site of the Sub-Contract Works or otherwise.

#### **1.25. Builder's Work**

All chasing, cutting away and making good shall be done by the Main Contractor but the Sub-Contractor shall mark out in advance and shall be

responsible for accuracy of the size and position of all holes and chases required.

The Sub-Contractor shall drill and plug holes in floors, walls, ceiling and roof for securing services and equipment requiring screw or bolt fixings.

Any purpose made fixing brackets shall not constitute builder's work and shall be provided and installed by the Sub-Contractor unless stated hereinafter to the contrary.

#### **1.26. Structural Provision for the Works**

Preliminary major structural provision has been made for the Sub-Contract Works based on outline information ascertained during the preparation of the Specification.

The preliminary major structural provision made will be deemed as adequate unless the Sub-Contractor stated otherwise when submitting his tender. Any major structural provision or alteration to major structural provisions required by the Sub-Contractor shall be shown on Working Drawings to be submitted to the Engineer within 30 days of being appointed.

No requests for alterations to preliminary major structural provisions will be approved except where they are considered unavoidable by the Engineer. In no case will they be approved if building work is so far advanced as to cause additional costs or delays in the work of the Main Contractor.

#### **1.27. Position of Services, Plant, Equipment, Fittings and Apparatus**

The Sub-Contract Drawings give a general indication of the intended layout. The position of the equipment and apparatus, and also the exact routes of the ducts, main and distribution pipework shall be confirmed before installation is commenced. The exact siting of appliances, pipework, etc., may vary from that indicated.

The routes of services and positions of apparatus shall be determined by the approved dimensions detailed in the Working Drawings or on site by the Engineer in consultation with the Sub-Contractor or the Main Sub-Contractor.

Services throughout the ducts shall be arranged to allow maximum access along the ducts and the services shall be readily accessible for maintenance. Any work which has to be re-done due to negligence (by Sub-Contractor) in this respect shall be the Sub-Contractor's responsibility.

The Sub-Contractor shall be deemed to have allowed in his Sub-Contract Sum for locating terminal points of services (e.g. lighting, switches, socket outlets, lighting points, control switches, thermostats and other initiating devices, taps, stop cocks) in positions plus or minus 1.2m horizontally and vertically from the locations shown on Sub-Contract Drawings. Within these limits no variations in the Sub-Contract Sum will be made unless the work has already been executed in accordance with previously approved Working Drawings and with the approval of the Engineer.

#### **1.28. Checking of Work**

The Sub-Contractor shall satisfy himself to the correctness of the connections he makes to all items of equipment supplied under the Sub-Contract agreement and equipment supplied under other Sub-Contracts before it is put into operation. Details of operation, working pressures, temperatures, voltages, phases, power rating, etc., shall be confirmed to others and confirmation received before the system is first operated.

#### **1.29. Setting to Work and Regulating System**

The Sub-Contractor shall carry out such tests of the Sub-Contract Works as required by BS Specifications, or equal and approved codes as specified hereinafter and as customary.

No testing or commissioning shall be undertaken except in the presence of and to the satisfaction of the Engineer unless otherwise stated by him (Sub-Contractor's own preliminary and proving tests exempted).

It will be deemed that the Sub-Contractor has included in the Sub-Contract Sum for the costs of all fuel, power, water and the like, for testing and commissioning as required as part of the Sub-Contract Works. He shall submit for approval to the Engineer a suitable programme for testing and commissioning. The Engineer and Employer shall be given ample warning in writing, as to the date on which testing and commissioning will take place.

The Sub-Contractor shall commission the Sub- contract Works and provide attendance during the commissioning of all services, plant and apparatus connected under the Sub-Contract Agreement or other Sub-Contract Agreements, related to the project.

Each system shall be properly balanced, graded and regulated to ensure that correct distribution is achieved and where existing installations are affected, the Sub-Contractor shall also regulate these systems to ensure that their performance is maintained.

The proving of any system of plant or equipment as to compliance with the Specification shall not be approved by the Engineer, except at his discretion, until tests have been carried out under operating conditions pertaining to the



most onerous conditions specified except where the time taken to obtain such conditions is unreasonable or exceeds 12 months after practical completion of the Sub- contract Works.

### **1.30. Identification of Plant Components**

The Sub-Contractor shall supply and fix identification labels to all plant, starters, switches and items of control equipment including valves, with white traffolyte or equal labels engraved in red lettering denoting its name, function and section controlled. The labels shall be mounted on equipment and in the most convenient positions. Care shall be taken to ensure the labels can be read without difficulty. This requirement shall apply also to major components of items of control equipment.

Details of the lettering of the labels and the method of mounting or supporting shall be forwarded to the Engineer for approval prior to manufacture.

### **1.31. Sub-Contract Drawings**

The Sub-Contract Drawings when read in conjunction with the text of the Specification, have been completed in such detail as was considered necessary to enable competitive tenders to be obtained for the execution and completion of the Sub-Contract works.

The Sub-Contract Drawings are not intended to be Working Drawings and shall not be used unless exceptionally they are released for this purpose.

### **1.32. Working Drawings**

The Sub-Contractor shall prepare such Working Drawings as may be necessary. The Working Drawings shall be complete in such detail not only that the Sub-Contract Works can be executed on site but also that the Engineer can approve the Sub-Contractor's proposals, detailed designs and intentions in the execution of the Sub-Contract Works.

If the Sub-Contractor requires any further instructions, details, Sub-Contract Drawings or information drawings to enable him to prepare his Working Drawings or proposals, the Sub-Contractor shall accept at his own cost, the risk that any work, commenced or which he intends to commence at site may be rejected.

The Engineer, in giving his approval to the Working Drawings, will presume that any necessary action has been, or shall be taken by the Sub-Contractor to ensure that the installations shown on the Working Drawings have been cleared with the Main Contractor and any other Sub-Contractors whose installations and works might be affected.

If the Sub-Contractor submits his Working Drawings to the Engineer without first liaising and obtaining clearance for his installations from the Main Contractor and other Sub-Contractors whose installations and works might be affected, then he shall be liable to pay for any alterations or modification to his own, the Main Contractor's or other Sub-Contractor's installations and works, which are incurred, notwithstanding any technical or other approval received from the Engineer.

Working Drawings to be prepared by the Sub-Contractor shall include but not be restricted to the following:

- (a) Any drawings required by the Main Contractor, or Engineer to enable structural provisions to be made including Builder's Working Drawings or Schedules and those for the detailing of holes, fixings, foundations, cables and paperwork ducting below or above ground or in or outside or below buildings.
- (b) General Arrangement Drawings of all plant, control boards, fittings and apparatus or any part thereof and of installation layout arrangement of such plant and apparatus.
- (c) Schematic Layout Drawings of services and of control equipment.
- (d) Layout Drawings of all embedded and non-embedded paperwork, ducts and electrical conduits.
- (e) Complete circuit drawings of the equipment, together with associated circuit description.
- (f) Such other drawings as are called for in the text of the Specification or Schedules or as the Engineer may reasonably require.

Three copies of all Working Drawings shall be submitted to the Engineer for approval. One copy of the Working Drawings submitted to the Engineer for approval shall be returned to the Sub-Contractor indicating approval or amendment therein.

Six copies of the approved Working Drawings shall be given to the Main Contractor by the Sub-Contractor for information and distribution to other Sub-Contractors carrying out work associated with or in close proximity to or which might be affected by the Sub-Contract Works.

Approved Working Drawings shall not be departed from except as may be approved or directed by the Engineer.

Approval by the Engineer of Working Drawings shall neither relieve the Sub-Sub-Contractor of any of his obligations under the Sub- contract nor relieve him from correcting any errors found subsequently in the Approved Working

Drawings or other Working Drawings and in the Sub-Contract Works on site or elsewhere associated therewith.

The Sub-Contractor shall ensure that the Working Drawings are submitted to the Architect for approval at a time not unreasonably close to the date when such approval is required. Late submission of his Working Drawings will not relieve the Sub-Contractor of his obligation to complete the Sub-Contract Works within the agreed Sub-Contract Period and in a manner that would receive the approval of the Architect.

### **1.33. Record Drawings (As Installed) and Instructions**

During the execution of the Sub-Contract Works the Sub-Contractor shall, in a manner approved by the Engineer record on Working or other Drawings at site all information necessary for preparing Record Drawings of the installed Sub-Contract Works. Marked-up Working or other Drawings and other documents shall be made available to the Engineer as he may require for inspection and checking.

Record Drawings, may, subject to the approval of the Engineer, include approved Working Drawings adjusted as necessary and certified by the Sub-Contractor as a correct record of the installation of the Sub-Contract Works.

They shall include but not restricted to the following drawings or information:

- (g) Working Drawings amended as necessary but titled "Record Drawings" and certified as a true record of the "As Installed" Sub-Contract Works. Subject to the approval of the Engineer such Working Drawings as may be inappropriate may be omitted.
- (h) Fully dimensioned drawings of all plant and apparatus.
- (i) General arrangement drawings of equipment, other areas containing plant forming part of the Sub-Contract Works and the like, indicating the accurate size and location of the plant and apparatus suitability cross-referenced to the drawings mentioned in (b) above and hereinafter.
- (j) Routes, types, sizes and arrangement of all pipework and ductwork including dates of installation of underground pipework.
- (k) Relay adjustment charts and manuals.
- (l) Routes, types, sizes and arrangement of all electric cables, conduits, ducts and wiring including the dates of installation of buried works.
- (m) System schematic and trunking diagrams showing all salient information relating to control and instrumentation.
- (n) Grading Charts.

- (o) Valve schedules and locations suitability cross-referenced.
- (p) Wiring and piping diagrams of plant and apparatus.
- (q) Schematic diagrams of individual plant, apparatus and switch and control boards. These diagrams to include those peculiar to individual plant or apparatus and also those applicable to system operation as a whole.
- (r) Operating Instructions.

Schematic and wiring diagrams shall not be manufacturer's multipurpose general issue drawings. They shall be prepared specially for the Sub-Contract Works and shall contain no spurious or irrelevant information.

Marked-up drawings of the installation of the Sub- contract Works shall be kept to date and completed by the date of practical or section completion. Two copies of the Record Drawings of Sub-Contract Works and two sets of the relay adjustment and grading charts and schematic diagrams on stiff backing shall be provided not later than one month later.

The Sub-Contractor shall supply for fixing in sub-stations, switch-rooms, boiler houses, plant rooms, pump houses, the office of the Maintenance Engineer and other places, suitable valve and instructions charts, schematic diagrams of instrumentation and of the electrical reticulation as may be requested by the Engineer providing that the charts, diagrams, etc., relate to installations forming part of the Sub-Contract Works. All such charts and diagrams shall be of suitable plastic material on a stiff backing and must be approved by the Engineer before final printing.

Notwithstanding the Sub-Contractor's obligations referred to above, if the Sub- -contractor fails to produce to the Engineer's approval, either:-

- (s) The Marked-up Drawings during the execution of the Sub-Contract Works or
- (t) The Record Drawings, etc., within one month of the Section or Practical Completion

The Engineer shall have these drawings produced by others. The cost of obtaining the necessary information and preparing such drawings, etc., will be recovered from the Sub-Contractor.

#### **1.34. Maintenance Manual**

Upon Practical Completion of the Sub-Contract Works, the Sub-Contractor shall furnish the Engineer four copies of a Maintenance Manual relating to the installation forming part of all of the Sub-Contract Works.

The manual shall be loose-leaf type, International A4 size with stiff covers and cloth bound. It may be in several volumes and shall be sub-divided into

sections, each section covering one Engineering service system. It shall have a ready means of reference and a detailed index.

There shall be a separate volume dealing with Air Conditioning and Mechanical Ventilation installation where such installations are included in the Sub- contract Works.

The manual shall contain full operating and maintenance instructions for each item of equipment, plant and apparatus set out in a form dealing systematically with each system. It shall include as may be applicable to the Sub-Contract Works the following and any other items listed in the text of the Specifications:

- (a) System Description.
- (b) Plant
- (c) Valve Operation
- (d) Switch Operation
- (e) Procedure of Fault Finding
- (f) Emergency Procedures
- (g) Lubrication Requirements
- (h) Maintenance and Servicing Periods and Procedures
- (i) Colour Coding Legend for all Services
- (j) Schematic and Wiring Diagrams of Plant and Apparatus
- (k) Record Drawings, true to scale, folded to International A4 size
- (l) Lists of Primary and Secondary Spares.

The manual is to be specially prepared for the Sub-Contract Works and manufacturer's standard descriptive literature and plant operating instruction cards will not be accepted for inclusion unless exceptionally approved by the Engineer. The Sub-Contractor shall, however, affix such cards, if suitable, adjacent to plant and apparatus. One spare set of all such cards shall be furnished to the Engineer.

### **1.35. Hand-over**

The Sub-Contract Works shall be considered complete and the Maintenance and Defects Liability Period shall commence only when the Sub-Contract Works and supporting services have been tested, commissioned and operated to the satisfaction of the Engineer and officially approved and accepted by the Employer, provided always that the handing over of the Sub-Contract Works shall be coincident with the handing over of the Main contract Works.

The procedure to be followed will be as follows:

- (a) On the completion of the Sub-Contract Works to the satisfaction of the Engineer and the Employer, the Sub-Contractor shall request the Engineer, at site to arrange for handing over.
- (b) The Engineer shall arrange a Hand-over Meeting or a series thereof, at site.
- (c) The Sub-Contractor shall arrange with the Engineer and Employer for a complete demonstration of each and every service to be carried out and for instruction to be given to the relevant operation staff and other representatives of the Employer.
- (d) In the presence of the Employer and the Engineer, Hand-over will take place, subject to Agreement of the Hand-over Certificates and associated check lists.

### **1.36. Painting**

It will be deemed that the Sub-Contractor allowed for all protective and finish painting in the Sub-Contract Sum for the Sub-Contract Works, including colour coding of service pipework to the approval of the Engineer. Any special requirements are described in the text of the Specifications.

### **1.37. Spares**

The Sub-Contractor shall supply and deliver such spares suitably protected and boxed to the Engineer's approval as are called for in the Specifications or in the Price Schedules.

### **1.38. Testing and Inspection – Manufactured Plant**

The Engineer reserves the right to inspect and test or witness of all manufactured plant equipment and materials.

The right of the Engineer relating to the inspection, examination and testing of plant during manufacture shall be applicable to Insurance companies and inspection authorities so nominated by the Engineer.

The Sub-Contractor shall give two weeks' notice to the Engineer of his intention to carry out any inspection or tests and the Engineer or his representative shall be entitled to witness such tests and inspections.

Six copies of all test certificates and performance curves shall be submitted as soon as possible after the completion of such tests, to the Engineer for his approval.

Plant or equipment which is shipped before the relevant test certificate has been approved by the Engineer shall be shipped at the Sub-Contractor's own risk and should the test certificate not be approved new tests may be ordered by the Engineer at the Sub-Contractor's expense.

The foregoing provisions relate to tests at manufacturer's works and as appropriate to those carried out at site.

### **1.39. Testing and Inspection of Installations**

Allow for testing each section of the Sub-Contract Works installation as described hereinafter to the satisfaction of the Engineer.

### **1.40. Temporary Structures**

The Sub-Contractor shall provide the necessary temporary workshop and mess- room in position to be approved by the Architect.

The work people employed by the Sub-Contractor shall occupy or be about only that part of the site necessary for the performance of the work and the Sub-Contractor shall instruct his employees accordingly.

If practicable, W.C. accommodation shall be allocated for the sole use of the Sub-Contractor's workmen and the Sub-Contractor will be required to keep the same clean and disinfected, to make good any damage thereto and leave in good condition.

### **1.41. Storage of Materials**

The Sub-Contractor may be allocated certain areas of partially finished building for the purpose of storing material and equipment on site, when such areas are available.

The Main Contractor shall be responsible for making the storage area waterproof but the Sub-Contractor shall be responsible for providing his own lock-up facilities and sheds.

The Sub-Contractor shall exercise particular care not to damage in any way the finished floors, plastered or painted walls and ceilings of the buildings. Care shall particularly be taken not to discolour finished concreted or granolithic floors. The Sub-Contractor shall be liable for making good any damage.

The Sub-Contractor shall, when called upon at any time by the Engineer or Clerk of Works, move any of his plant or material elsewhere notwithstanding his having previously obtained permission for it to be temporary accommodated at any location.

No materials shall be stored or stacked on suspended slabs without the prior approval of the Project Manager.

### **1.42. Initial Maintenance**

The Sub-Contractor shall make routine maintenance once a month during the liability for the Defects Period and shall carry out all necessary adjustments and repairs, cleaning and oiling of moving parts. A monthly report of the inspection and any works done upon the installation shall be supplied to the Engineer.

The Sub-Contractor shall also provide a 24 -hour break-down service to attend to faults on or malfunctioning of the installation between the routine visits of inspection.

The Sub-Contractor shall allow in the Sub-Contract Sum of the initial maintenance, inspection and break-down service and shall provide for all tools, instruments, plant and scaffolding and the transportation thereof, as required for the correct and full execution of these obligations and the provision, use or installation of all materials as oils, greases, sandpaper, etc., or parts which are periodically renewed such as brake linings etc., or parts which are faulty for any reason whatsoever excepting always Acts of God such as storm, tempest, flood, earthquake and civil revolt, acts of war and vandalism.

#### **1.43. Maintenance and Servicing After Completion of Initial Maintenance**

The Sub-Contractor shall, if required, enter into a maintenance and service agreement with the employer for the installation for a period of up to five years from the day following the last day of the liability for Defects Period which offers the same facilities as specified in Clause 1.42 (Initial Maintenance).

The terms of any such agreement shall not be less beneficial to the employer than the terms of Agreements for either similar installation.

The Sub-Contractor shall submit with his tender for the works, where called upon a firm quotation for the maintenance and service of the installation as specified herein, which shall be based upon the present day costs and may be varied only to take into account increases in material and labour unit rate costs between the time of tendering and the signing of the formal maintenance and service agreement and which shall remain valid and open for acceptance by the Employer to and including the last day of the fifth complete calendar month following the end of the liability for Defects Period.

#### **1.44. Trade Names**

Where trade names of manufacturer's catalogue numbers are mentioned in the Specification or the Bills of Quantities, the reference is intended as a guide to the type of article or quality of material required. Alternate brands of equal and approved quality will be acceptable.

#### **1.45. Water and Electricity for the Works**

These will be made available by the Main Contractor. The Sub-Contractor shall be liable for the cost of any water or electric current used and for any installation provided especially for their own use by the Main Contractor.

#### **1.46. Protection**



The Sub-Contractor shall adequately cover up and protect his own work to prevent injury and also to cover up and protect from damage all parts of the building or premises where work is performed by him under the Sub-Contract.

**1.47. Defects After Completion**

The defects liability period will be 6 months from the date of completion of the Main contract as certified by the Engineer.

**1.48. Damages for Delay**

Liquidated and Ascertained damages as stated in the Main Contract Agreement will be claimed against the Main Contractor for any unauthorized delay in completion. The Sub-Contractor shall be held liable for the whole or a portion of these damages should he be the cause delay in completion of the Works.

**1.49. Clear Away on Completion**

The Sub-Contractor shall, upon completion of the works, at his own expense, remove and clear away all plant, equipment, rubbish and unused materials, and shall leave the whole of the works in a clean and tidy state, to the satisfaction of the Engineer. On completion, the whole of the works shall be delivered up clean, complete and perfect in every respect to the satisfaction of the Engineer.

**1.50. Final Account**

On completion of the works the Sub-Contractor shall agree with the Engineer the value of any variations outstanding and as soon as possible thereafter submit to the Engineer his final statement of account showing the total sum claimed sub- divided as follows:

Statement A - detailing the tender amounts less the Prime Cost and Provisional Sums, included therein.

Statement B - detailing all the variation orders issued on the Sub-Contract.

Statement C - Summarizing statement A and B giving the net grand total due to the Sub-Contractor for the execution of the Sub-Contract.

**1.51. Fair Wages**

The Sub-Contractor shall in respect of all persons employed anywhere by him in the execution of the Sub-Contract, in every factory, workshop or place occupied or used by him for execution of the Sub-Contract, observe and fulfil the following conditions:

- (u) The Sub-Contractor shall pay rates of the wages and observe hours and conditions of labour not less favourable than those established for the trade or industry in the district where work is carried out.
- (v) In the absence of any rates of wages, hours or conditions of labour so established the Sub-Contractor shall pay rates and observe hours and conditions of labour are not less favourable than the general level of wages, hours and conditions observed by other employers whose general circumstances in the trade or industry in which the Sub-Contractor is engaged are similar.

#### **1.52. Supervision**

During the progress of the works, the Sub-Contractor shall provide and keep constantly available for consultation on site an experienced English - speaking Supervisor and shall provide reasonable office facilities, attendance, etc., for the Supervisor.

In addition, during the whole of the time the works are under construction, the Sub-Contractor shall maintain on site one experienced foreman or charge-hand and an adequate number of fitters, etc., for the work covered by the Specification. The number of this staff shall not be reduced without the prior written approval of the Project manager or Engineer.

Any instructions given to the Supervisor on site shall be deemed to have been given to the Sub-Contractor.

One copy of this Specification and one copy of each of the Sub-Contract Drawings (latest issue) must be retained on site at all times, and available for reference by the Engineer or Sub-Contractor.

#### **1.53. Test Certificates**

The Sub-Contractor shall provide the Engineer with three copies of all test reports or certificates that are or may be required by this Specification.

#### **1.54. Labour**

The Sub-Contractor shall provide skilled and unskilled labour as may be necessary for completion of the Sub-Contract.

#### **1.55. Discount to the Main Contractor**

No discount to the Main Contractor will be included in the tender for this installation.

#### **1.56. Guarantee**

The whole of the work will be guaranteed for a period of 6 months from the date of the Engineer's certification of completion and under such guarantee the Sub-Contractor shall remedy at his expense all defects in materials and apparatus due to faulty design, construction or workmanship which may develop in that period.

**1.57. Direct Sub-Contracts**

Notwithstanding the foregoing conditions, the University reserves the right to place a "Direct Sub-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 instance, profit relative to the P.C Sum in the priced Bills of Quantities will be adjusted as deserved for P.C Sum allowed.

**1.58. Attendance Upon the Tradesmen etc**

The Sub-Contractor shall allow for the attendance of trade upon trade and shall afford any tradesmen or other persons employed for the execution of any work not included in this Sub-Contract every facility for carrying out their work and also for the use of ordinary scaffolding. The Sub-Contractor however, shall not be required to erect any special scaffolding for them.

**1.59. Trade Unions**

The Sub-Contractor shall recognize the freedom of his work people to be members of trade unions.

**1.60. Local and other Authorities notices and fees**

The Sub-Contractor shall comply with and give all notices required by any Regulations, Act or by Law of any Local Authority or of any Public Service, Company or Authority who have any jurisdiction with regard to the works or with those systems the same are or will be connected and he shall pay and indemnify the University against any fees or charges legally demandable under any regulation or by-law in respect of the works; provided that the said fees and charges if not expressly included in the Sub-Contract sum or stated by way of provisional sum shall be added to the Sub-Contract sum.

The Sub-Contractor before making any variation from the Sub-Contract drawings or specification necessitated by such compliance shall give the Project Manager written notice specifying and giving the reason for such variation and applying for instructions in reference thereto.

If the Sub-Contractor within seven days of having applied for the same does not receive such instructions, he shall proceed with the works in conforming

to the provision regulation or by-law in question and any variation thereby necessitated shall be deemed to be a variation in accordance to the conditions of Sub-Contract.

**1.61. Assignment or subletting**

The Sub-Contractor shall not without the written consent of the Project Manager assign this Sub-Contract or sublet any portion of the works, provided that such consent shall not be unreasonably withheld to the prejudice of the Sub-Contractor.

**1.62. Partial Completion**

If the Employer shall take over any part or parts of works, apparatus, equipment etc. then within seven days from the date on which the Employer shall have taken possession of the relevant part, the Project Manager shall issue a Certificate stating his estimate of the approximate total value of the works which shall be the total value of that part and practical completion of the relevant part shall be deemed to have occurred, and the Defect Liability Period in respect of the relevant part be deemed to have commenced on the date the Employer shall have taken possession thereof.

The Sub-Contractor shall make good any defects or other faults in the relevant part that had been deemed complete.

The Sub-Contractor shall reduce the value of insurance by the full value of the relevant part.

The Sub-Contractor shall be paid for the part of works taken possession by the Employer.

**1.63. Temporary Works**

Where temporal works shall be deemed necessary, such as Temporary lighting, the Sub-Contractor shall take precaution to prevent damage to such works.

The Sub-Contractor shall include for the cost of and make necessary arrangements with the Project Manager for such temporary works. For temporary lighting, electricity shall be metered and paid for by the Sub-Contract

**1.64. Patent Rights**

The Sub-Contractor shall fully indemnify the Employer; against any action, claim or proceeding relating to infringement of any patent or design rights, and pay any royalties which may be payable in respect of any article or any part thereof, which shall have been supplied by the Sub-Contractor to the Project Manager. In like manner the Employer shall fully indemnify the Sub-

Contractor against any such action, claim or proceedings for infringement under the works, the design thereof of which shall have been supplied by the Project Manager to the Sub-Contractor, but this indemnify shall apply to the works only, and any permission or request to manufacture to the order of the Project Manager shall not relieve the Sub-Contractor from liability should he manufacture for supply to other buyers.

#### **1.65. Mobilization and Demobilization**

The Sub-Contractor shall mobilize labour plant and equipment to site according to his programme and schedule of work He shall ensure optimum presence and utilization of labour, plant and equipment. He should not pay and maintain unnecessary labour force or maintain and service idle plant and equipment. Where necessary he shall demobilize and mobilize the labour, plant and equipment, as he deems fit to ensure optimum progress of the works and this shall be considered to be a continuous process as works progress. He shall make provision for this item in his tender. No claim will be entertained where the Sub-Contractor has not made any provision for mobilization and demobilization of labour, plant and equipment in the preliminary bills of quantities or elsewhere in this tender.

#### **1.66. Extended Preliminaries**

Where it shall be necessary to extend the Sub-Contract period by the Project manager the Sub-Contractor shall still ensure availability on site, optimum labour, materials, plant and equipment. The Sub-Contractor shall make provision for extended preliminaries, should the Sub-Contract period be extended and this shall be in a form of a percentage of the proportion of the Sub-Contract works remaining as at that time of extension. Where called upon in the Appendix to these Preliminaries the Sub-Contractor shall insert his percentage per month for extended preliminaries that shall form basis for compensation.

Lack of inserting the percentage shall mean that the Sub-Contractor has provided for this requirement elsewhere in the Bills of Quantities.

#### **1.67. Supervision by Engineer and Site Meetings**

A competent Project Engineer appointed by the Engineer as his representative shall supervise the Sub-Contract works. The Project Engineer shall be responsible for issuing all the site instructions in any variations to the works and these shall be delivered through the Sub-Contractor with the authority of the Project Manager. Any instructions given verbal shall be confirmed in writing.

The project engineer and (or) the Engineer shall attend management meetings arranged by the Project Manager and for which the Sub-Contractor

or his representative shall also attend. For the purpose of supervising the project, provisional sums are provided to cover for transport and allowances. The Sub-Contractor shall in his tender allow for the provision of management meetings and site inspections, as instructed by the Engineer, and also profit and attendance on these funds. The funds shall be expended according to Project Manager's instructions to the Sub-Contractor.

#### **1.68. Amendment to Scope of Sub-Contract Works**

No amendment to scope of Sub-Contract works is expected and in case of amendment or modification to scope of work, these shall be communicated to all tenderers in sufficient time before the deadline of the tender submission. However during the Sub-Contract period and as the works progress the Project Manager may vary the works as per conditions of Sub-Contract by issuing site instructions.

No claims shall be entertained on account of variation to scope of works either to increase the works (pre-financing) or reduction of works (loss of profit-see clause 1.69)

#### **1.69. Sub-Contractor Obligation and Employers Obligation**

The Sub-Contractor will finance all activities as part of his obligation to this Sub-Contract. The employer shall pay interim payment for materials and work completed on site as his obligation in this Sub-Contract, as the works progresses. No claims will be entertained for pre-financing of the project by the Sub-Contractor, or for loss of profit (expectation loss) in case of premature termination, reduction or increase of works as the Sub-Contractor shall be deemed to have taken adequate measures in programming his works and expenditure and taken necessary financial precaution while executing the works. No interest shall be payable to the Sub-Contractor, except as relates to late payment as in the conditions of Sub-Contract clause 23.3. The Sub-Contractor shall where called upon, insert his price to compensate for any of the occurrence stated here (premature termination, reduction or increase of works), as a percentage of the Sub-Contract sum in the Appendix to this section.

## **APPENDIX TO SUB-CONTRACT PRELIMINARIES AND GENERAL CONDITIONS**

**1. ADD TO CLAUSE 1.40**

There is no labour camp.

**2. MODIFY CLAUSE 1.66**

Percentage of extended preliminaries shall be inserted in Bill No.1 page H/5 of section H. However, this amount of the extended preliminaries SHALL NOT exceed the Liquidated and Ascertained Damages indicated on page B-23 of Section B of this tender document

**3. ADD TO CLAUSE 1.17**

Prices quoted shall include 14% VAT and 3% withholding tax including all other taxes applicable at the time of tender.

In accordance with Government policy, the 14% VAT and 3% withholding tax shall be deducted from all payments made to the Sub-Contractor, and the same shall subsequently be forwarded to the Kenya Revenue Authority (KRA).

**4. OMIT CLAUSE 1.12**

**SECTION VIII**  
**GENERAL SPECIFICATIONS**  
**OF**  
**MATERIALS AND WORKS**



## **GENERAL SPECIFICATIONS OF MATERIALS AND WORKS**

### **2.1 General**

This section specifies the general requirement for plant, equipment and materials forming part of the Sub-contract Works and shall apply except where specifically stated elsewhere in the Specification or on the Sub-Contract Drawings.

### **2.2 Quality of Materials**

All plant, equipment and materials supplied as part of the Sub-contract Works shall be new and of first class commercial quality, shall be free from defects and imperfections and where indicated shall be of grades and classifications designated herein.

All products or materials not manufactured by the Sub-contractor shall be products of reputable manufacturers and so far as the provisions of the Specification is concerned shall be as if they had been manufactured by the Sub-contractor.

Materials and apparatus required for the complete installation as called for by the Specification and Sub-Contract Drawings shall be supplied by the Sub-contractor unless mention is made otherwise.

Materials and apparatus supplied by others for installation and connection by the Sub-contractor shall be carefully examined on receipt. Should any defects be noted, the Sub-contractor shall immediately notify the Engineer.

Defective equipment or that damaged in the course of installation or tests shall be replaced as required to the approval of the Engineer.

### **2.3 Regulations and Standards**

The Sub-contract Works shall comply with the current editions of the following:

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

## **2.4 Electrical Requirements**

Plant and equipment supplied under this Sub-contract shall be complete with all necessary motor starters, control boards, and other control apparatus. Where control panels incorporating several starters are supplied they shall be complete with a main isolator.

The supply of power up to and including local isolators shall be provided and installed by the Electrical Sub-contractor. All other wiring and connections to equipment shall form part of this Sub-contract and be the responsibility of the Sub-contractor.

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

The starting current of all electric motors and equipment shall not exceed the maximum permissible starting currents described in the Kenya Power and Lighting Company (KPLC) By-laws.

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

Any equipment that is not rated for the above voltages and frequencies shall be rejected by the Engineer.

## **2.5 Transport and Storage**

All plant and equipment shall, during transportation be suitably packed, crated and protected to minimize the possibility of damage and to prevent corrosion or other deterioration. On arrival at site all plant and equipment shall be examined and any damage to parts and protective priming coats made good before storage or installation.

Adequate measures shall be taken by the Sub-contractor to ensure that plant and equipment do not suffer any deterioration during storage.

Prior to installation all piping and equipment shall be thoroughly cleaned. If, in the opinion of the Engineer any equipment has deteriorated or been damaged to such an extent that it is not suitable for installation, the Sub-contractor shall replace this equipment at his own cost.

## **2.6 Site Supervision**

The Sub-contractor shall ensure that there is an English-speaking supervisor on the site at all times during normal working hours.

## **2.7 Installation**

Installation of all special plant and equipment shall be carried out by the Sub-contractor under adequate supervision from skilled staff provided by the plant and equipment manufacturer or his appointed agent in accordance with the best standards of modern practice and to the relevant regulations and standards described under Clause 2.03 of this Section.

## **2.8 Testing**

### **2.8.1 General**

The Sub-contractor's attention is drawn to Part 'C' Clause 1.38 of the "Preliminaries and General Conditions".

### **2.8.2 Material Tests**

All material for plant and equipment to be installed under this Sub-contract shall be tested, unless otherwise directed, in accordance with the relevant B.S Specification concerned.

For materials where no BS Specification exists, tests are to be made in accordance with the best modern commercial methods to the approval of the Engineer, having regard to the particular type of the materials concerned.

The Sub-contractor shall prepare specimens and performance tests and analyses to demonstrate conformance of the various materials with the applicable standards.

If stock material, which has not been specially manufactured for the plant and equipment specified is used, then the Sub-contractor shall submit satisfactory evidence to the Engineer that such materials conform to the requirements stated herein in which case tests of material may be partially or completely waived.

Certified mill test reports of plates, piping and other materials shall be deemed acceptable.

### **2.8.3 Manufactured Plant and Equipment – Work Tests**

The rights of the Engineer relating to the inspection, examination and testing of plant and equipment during manufacture shall be applicable to the Insurance Companies or Inspection Authorities so nominated by the Engineer.

The Sub-contractor shall give two weeks' notice to the Engineer of the manufacturer's intention to carry out such tests and inspections.

The Engineer or his representative shall be entitled to witness such tests and inspections. The cost of such tests and inspections shall be borne by the Sub-contractor.

Six copies of all test and inspection certificates and performance graphs shall be submitted to the Engineer for his approval as soon as possible after the completion of such tests and inspections.

Plant and equipment which is shipped before the relevant test certificate has been approved by the Engineer shall be shipped at the Sub-contractor's own risk and should the test and inspection certificates not be approved, new tests may be ordered by the Engineer at the Sub-contractor's expense.

#### **2.8.4 Pressure Testing**

All pipework installations shall be pressure tested in accordance with the requirements of the various sections of this Specification. The installations may be tested in sections to suit the progress of the works but all tests must be carried out before the work is buried or concealed behind building finishes. All tests must be witnessed by the Engineer or his representative and the Sub-contractor shall give 48 hours' notice to the Engineer of his intention to carry out such tests.

Any pipework that is buried or concealed before witnessed pressure tests have been carried out shall be exposed at the expense of the Sub-contractor and the specified tests shall then be applied.

The Sub-contractor shall prepare test certificates for signature by the Engineer and shall keep a progressive and up-to-date record of the section of the work that has been tested.

### **2.9 Colour Coding**

Unless stated otherwise in the Particular Specification all pipework shall be colour coded in accordance with the latest edition of B.S 1710 and to the approval of the Engineer or Architect.

### **2.10 Welding**

#### **2.10.1 Preparation**

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

#### **2.10.2 Method**

All welding shall be carried out by the electric arc processing using covered electrodes in accordance with BS 639.

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

### **2.10.3 Welding Code and Construction**

All welded joints shall be carried out in accordance with the following Specifications:

### **2.10.4 Pipe Welding**

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

### **2.10.5 General Welding**

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

### **2.10.6 Welders Qualifications**

Any welder employed on this Sub-contractor shall have passed the trade tests as laid down by the Government of Kenya. The Engineer may require to see the appropriate certificate obtained by any welder and should it be proved that the welder does not have the necessary qualifications the Engineer may instruct the Sub- contractor to replace him by a qualified welder.

# **GENERAL SPECIFICATIONS FOR SANITARY FITTINGS, PLUMBING, DRAINAGE, FIRE FIGHTING, WATER SUPPLY AND TREATMENT WORKS**

## **1. GENERAL**

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

### **1.1 Climatic Conditions**

The following climatic conditions apply at the site of the works and all plant, equipment, apparatus, materials and installations shall be suitable for these conditions.

Maximum temperature	-	30°C
Minimum temperature	-	15°C
Average temperature range	-	25°C
Relative humidity range	-	50% - 85%
Altitude	-	1226 M above sea level
Latitude	-	0° 14'19N
Longitude	-	34° 16'10E
Rainfall	-	Extremely heavy at certain periods of the year

The Sub-Contractor shall be deemed to have taken account of the above details in his prices and his planning of the execution of the works. Unless otherwise stated, all ratings of plant, equipment and apparatus shall be interpreted as site ratings and not sea level or other ratings.

## **2. SPECIFICATIONS FOR PLUMBING AND DRAINAGE**

### **2.1 Pipe Work and Fittings**

#### **Pipe work and Fittings**

All black steel pipe work up to 65mm nominal bore shall be manufactured in accordance with B.S.1387 Medium Grade, with tapered pipe threads in accordance with B.S.21. All fittings shall be of 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 pipe work, 80mm nominal bore up to 150mm nominal bore, shall manufactured to comply in all respects with the specifications of the 65mm pipe, except that screwed and bolted flanges shall replace unions and couplings for the jointing of pipes to valves and other items of plant.

## **Galvanised Steel Pipe Work**

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

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

## **Copper Tubing**

All copper tubing shall be manufactured in accordance with B.S.2871 from C.160

Phosphorus De-oxidized Non-Arsenical Copper' in accordance with B.S.1172.

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

Short copper connections tubes between galvanised pipe work and sanitary fittings shall not be used because of the risk of galvanic action.

If, as may occur in certain circumstances, it is not possible to make the 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.

## **Cast Iron Pipe work**

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

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

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

## **External Services**

Cast iron pipe work which is used in connection with buried external services, shall be manufactured, coated and tested in accordance with one of the methods described in B.S. Code of Practice 301, Clause 505c (v), to the approval of the Engineer.

## **Pitch Fibre Pipe Work**

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

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

## **Concrete Pipe**

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

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

- (1) Flexible spigot and socket type
- (2) Flexible rebated type (Storm water drainage only)
- (3) Ordinary spigot and socket type
- (4) Ordinary rebated type (Storm water drainage only Joints (1) and (2) shall be sealed with suitable rubber gaskets manufactured in accordance with BS 2494 except where they are likely to be contaminated by oil products in which case the gaskets shall be manufactured in accordance with BS 3514.

Joints (3) and (4) shall be made with an approved cement mortar mix.

## **PVC (Hard) Pressure Pipe and Fittings**

All P.V.C. pipes and fittings shall be manufactured in accordance with BS 3505:1968.

### **Jointing**

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

### **Anchoring**

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

### **Pipe Bed**

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

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



## **Testing**

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

## **A.B.S. Waste System**

Where indicated on the drawings and schedules, the Sub-contractor shall supply and fix A.B.S. Waste Pipes and fittings.

The pipes, traps and fittings shall be in accordance with the relevant British Standards, including B.S.3943, and fixed generally in accordance with manufacturer's instructions, and B.S.5572 : 1978.

Jointing of pipes shall be carried out by means of solvent welding. The manufacturer's 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

## **PVC 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 manufacturer whose fixing instructions shall be strictly adhered to.

Connections to W.C. and pans shall be effected by the use of a 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 on Drain as indicated on the drawings.

## **Cross Linked Polythene (as pexgol pipe work)**

All cross linked polythene pipe work shall be manufactured from high molecular weight polythene and shall be manufactured in accordance to DIN 16893 Class 1 and 2 and International Standards Organization (ISO) Series 3.2,5 and 8. All fittings shall be manufactured from brass and plastic to DIN 8076. The threads for fittings shall be made as

per B.S.P Standards. The installation of pipe work shall be done as per the manufactures instruction.

## **2.2 Valves**

### **Draw-off Taps and Stop Valves (up to 50mm Nominal Bore)**

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

### **Gate Valves**

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

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

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

### **Globe Valves**

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

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

### **Check or Non-Return Valves**

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

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

### **Ball Valves**

All ball valves for use in connection with hot and cold water services shall be of the Portsmouth type in accordance with the requirements of B.S.1212, constructed from bronze or other corrosion resistant materials.

These valves fall into three pressure classifications as follows:-

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

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

### **Manually Operated Mixing Valves**

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

## **2.3 Waste Fitment Traps**

### **Standard and Deep Seal P & S Traps**

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

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

### **Anti-Syphon Traps**

Where anti-syphon traps are specified, these shall be similar or equal to the range of traps manufactured by Greenwood and Hughes Ltd., Deacon Works, Little Hampton, Sussex, England.

The Trade name for traps manufactured by this company is "Grevak".

## **2.4 Pipe Supports**

### **(a) General**

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

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

Consideration shall be given, when designing supports, to the maintenance of desired pipe falls and the restraining 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.

### **(b) 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 a substitute for pipe clips without the prior approvals 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 NOMINAL BORES	COPPER TUBE BS 659	STEEL TUBE TO BS 1387
15mm	1.25mm	2.0mm
20mm	2.0mm	2.5mm
25mm	2.0mm	2.5mm
32mm	2.5mm	3.0mm
40mm	2.5mm	3.0mm
50mm	2.5mm	3.0mm
65mm	3.0mm	3.5mm
80mm	3.0mm	3.5mm
100mm	3.0mm	4.0mm
125mm	3.0mm	4.5mm
150mm	3.5mm	4.5mm

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

### **(c) Concrete and Pitch Fibre Pipes**

These pipes shall not be used for above ground application.

### **(d) Expansion Joints and Anchors**

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

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

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

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

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

## **2.5 Sanitary Appliances**

All sanitary appliances supplied and installed as part of the Sub-Contract Works shall comply with the general requirements of B.S. Code of Practice 305 and the particular requirements of the latest applicable B.S. Specification.

## **2.6 Pipe Sleeves**

Main runs of pipe work are to be fitted with sleeves where they pass through walls and floors. Generally the sleeves shall be of P.V.C. except where they pass through the structure, where they shall be mild steel. The sleeves shall have 6mm - 12mm clearance all around the pipe, or for insulated pipe work all around the insulation. The sleeves shall be "Envirograf" intumescent wall sleeves (IWS) type capable of expanding sealing the gap between the pipe and wall/floor offering unto 4 hours fire and smoke protection,

## **2.7 Installation**

### **General**

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

### **Above Ground Installation**

#### **(a) Water Services**

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

Where falls are not shown on the Sub-contract Drawings or stated elsewhere in the Specification, pipe work shall be installed parallel to the lines of the buildings and as close to the walls, ceilings, columns, etc., as is practicable.

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

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

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

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

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

### **(b) Sanitary Services**

Soil, Waste and vent pipe systems shall be installed in accordance with the best standards of modern practice as described in CP 5572 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 skirt shall be provided. The Sub-contractor shall be responsible for sealing the roof after installation of the stacks.

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

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

### **(c) Sanitary Appliances**

All sanitary appliances associated with the Sub-Contract Works shall be installed in accordance with the best standard of modern practice as described in C.P.305 to the approval of the Engineer.

### **(d) Installation of Cross linked Polythene pipe work**

In installing the pipe work, the black conduit pipe shall be inserted in the walls or under the floor in the shortest possible route and continuous line from the distributors to the outlet point. One pipe each for the hot and cold water. The minimum bending radius of the conduit pipe shall be 8 times the pipe diameter. A plastic elbow shall be used to secure the 105o elbow connected to the tap. The cross linked polythene pipe work shall be inserted into the conduit pipe from the distributor to the outlet point. The 105° elbow shall be connected to the end of pipe by means of an eye and a nut placed on the pipe. The 105° elbow shall be inserted into the elbow box and it shall be tightened with two 4.8mm x 40mm screws to the elbow box

## **2.8 Underground Installation**

### **(a) General**

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

### **(b) Sequence of Operation for Underground Service Installation**

(1) Setting Out As described in B.S. Code of Practice 301 Clause 502 (2)

Breaking Up Surface (if in Roads)

As described in BS Code of Practice 301 Clause 503 (3)

Excavation and Timbering

As described in BS Code of Practice 301 Clause 503 and the following:-

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

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

The Sub-contractor's prices shall have included for excavating in all materials met with, for trimming bottoms to the necessary falls and for any extra excavation required for planking, strutting and working space.

The Sub-contractor shall keep the whole of the trenches or other excavations free from water and shall execute such works and install such pumps as may be necessary to keep the excavation dry at all times.

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

### **(4) Laying of Concrete Beds or other Supports for Pipes (if required)**

As described in BS Code of Practice 301 Clause 504 and the following:-

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

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

### **(5) Pipe Laying and Jointing**

Drain pipes shall be laid and jointed as described under BS Code of Practice 301 Clause 505.

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

Water pipes shall be laid and jointed as described under BS Code of Practice 310, Clause 401, 402, 403 and 404.

## **(6) Manholes**

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

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

The sides of all channels in every manhole shall be brought up vertically to a height of not less than the diameter of the drain and shall be benched in good concrete from the top of the channels at an angle of 300 to the horizontal and floated to a smooth hard surface with a coat of 1:1 cement mortar.

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

(ii) Rectangular and Square Manholes

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

Depth Below Ground of Outgoing Invert	Internal Access Shaft Dimensions	Size of Main Channel Diameter L x W	Internal Chamber Dimensions L x W	Height of Chamber Above Benching	Wall Thickness
Up to 740	-	100 to 150	610 x 460	-	150
Up to 740	-	230 to 460	760 x 760	-	150
Up to 1200	-	100 to 150	760 x 760	-	150
160 to 120	-	230 to 460	910 x 910	-	150
1220 to 1800	-	100 to 150	910 x 910	-	150
1220 to 1800	-	230 to 460	1070 x 910	-	150
1830 to 4550	760 x 760	100 to 150	1370 x 910	1370	230
1830 to 4550	760 x 760	230 to 460	1370 x 1070	1370	230
4570 & over	760 x 760	100 to 150	1370 x 1140	1370	230
4570 & over	760 x 760	230 to 460	1370 x 1140	1370	230



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

#### **Length Branch Diameter**

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

150mm 380mm/branch on the side with most branches.

230 and 300mm 460mm/branch on the side with most branches.

460mm 610mm/branch on the side with most branches.

#### **Width Branch Diameter**

100mm to 300mm for each side with branches plug 160mm 460mm or the diameter of the main drain whichever is the greater.

#### **(iii) Precast Concrete Circular Manholes**

Where specified straight through precast concrete manholes shall be manufactured and constructed to comply with BS 556 and the following dimensional requirements, (Dimensions in millimetres)

Depth Ground of Outgoing Invert	Internal Access Shaft Dimensions	Size Main Channel Diameter	Chamber Diameter	Height Chamber
Upto 740	-	100 to 460	610 x 460	-
760 to 2410	-	100 to 460	760 x 760	-
2440 to 4550	760	100 to 460	760 x 760	1370
4570 to Over	760	100 to 460	910 x 910	1370

When branches are connected into manholes the internal diameter of the chamber shall be increased, as necessary, up to a maximum chamber diameter 1830mm.

#### **(iv) Steps Irons and Covers**

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

Every manhole or manhole access shaft shall be fitted with a removable air-tight cast iron cover to adequate size and strength, fixed in a manner which prevents surface water gaining access into the drainage system.

Cast manhole covers and frames shall be manufactured in accordance with the requirements of BS 497 and shall generally fall into the following categories:-

Heavy Duty        -        for Carriageways

Medium Duty	-	for Footpaths
Light Duty	-	for domestic premises or other places where they do not have to carry wheeled traffic.

#### **(v) Back Drop Connections**

Where the level of the branch drain entering the manhole is higher than can be suitably accommodated by the normal type benching, then the branch drain shall be connected to the manhole by means of a back drop connection

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

#### **(vi) Channels**

Where the branch channel connects to the main channel in the manhole, the invert of the branch channel shall be a minimum of 38mm higher than the main channel.

#### **(7) Testing of Pipelines**

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

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

#### **(8) Concrete Bedding, Haunching and Surround**

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

#### **(9) Backfilling**

Backfilling of trenches, headings and around manholes shall be carried out in accordance with the methods described in BS Code of Practice 301, Clause 508.

#### **(10) Reinstatement of Surfaces**

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

Where excavation has been carried out in public highways or other areas not forming part of the site the Sub-contractor shall be deemed to have allowed in his price for all charges associated with the temporary and final reinstatement requirements of the Local or highway Authority, whether this is carried out by the Sub-contractor or by the Authorities concerned.

No claims for extras in this respect will be accepted.

## **(11) Sewer Connection**

The Sub-contractor shall pay all charges associated with the connection by the Local Authority of the drainage to the Main sewer, including necessary reinstatement.

## **2.9 Testing and Inspection**

### **Site Test – Pipe Work Systems**

#### **(a) Underground Water Mains**

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

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

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

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

#### **(b) 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 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.

#### **(c) Underground Drainage System**

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

Short branch drains connected to a main drain between manholes shall be tested as one system with the main drain. In long branches a testing junction shall be inserted next to the junction with the main drain and the branch tested separately. After the test has been passed, the testing junction shall be effectively sealed.

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

Water test shall be carried out in accordance with the methods described under BS Code of Practice 301, Clause 601 (b) and (c) and the test pressure shall not be less than 1,520mm head at the highest point in the pipe section and not more than 10,360mm head at any point in the section.

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

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

Testing of manholes shall be carried out in accordance with the methods described under B.S. Code of Practice 301, Clause 601 (f).

#### (d) Above Ground Soil Waste and Ventilation Pipe System

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

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

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

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

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

### **Site Test - Performance**

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

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

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

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

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

All lagging for cold 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 aluminum foil finish and banded in colours to be approved by the Engineer.

In all respects, unless otherwise stated, the hot and cold water installation shall be carried out in accordance with the best 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 large diameter, by a power driven test pump which shall not be left unattended. In either case precautions shall be taken to ensure that the required pressure is not exceeded. Pressure gauges should be recalibrated before the tests.

The test pressure shall be one and a half times the maximum working pressure except where a pipe is manufactured from a material for which the relevant B.S. Specification designates a maximum test pressure as in the case of cast or spun iron pipes, where the test pressure should not exceed 120, 180 and 240 metre/head of Clause B, C, or D pipe, respectively.

## **2.10 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.

## **3. SPECIFICATION FOR MECHANICAL VENTILATION**

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4.14	Testing and Commissioning	C/7
4.15	Finish Painting	C/7
4.16	Instruction Period	C/7

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### **3.1 General**

The particular specification details the requirements for the installation and commissioning of the Dry Riser.

The Sub-contractor shall include for all appurtenances and appliances not necessarily called for in this specification or shown on the Sub-contract Drawings but which are necessary for the completion and satisfactory functioning of the works.

No claims for extra payment shall be accepted from the Sub-contractor because of his non-compliance with the above requirements.

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

#### **Scope of Works**

The Sub-contractor shall supply, deliver, erect, test and commission all the Dry Riser installation which is called for in this Specification and shown on the Sub-contract Drawings.

## **Installation**

It is the Sub-contractor's responsibility that the Dry riser is installed, and connected to the fire Brigade Breeching inlet. The dry riser shall be installed progressively within the main sub-contractor's program.

## **Landing Valves**

The dry riser outlets shall comply with the requirements of C.P. 5306 Part 1 1987 and B.S. 5041 Part 1. The hydrant riser outlets shall be located 2 No. per floor and shall be mounted with their center lines between 910 mm and 1,06M above finished floor level.

The hydrant valves shall be as Merry Weather "Equerry" constant outlet Pressure

Hydrant valve where working pressures exceed 500 KN/m (5.0bar).

Where the working pressure does not exceed 500KN/m (5 bar) a hydrant valve other than "Equerry" but conforming to C.O. 5306 Part 1 1987 and B.S. 5041 Part 1 is to be installed.

## **Fire Brigade Breeching Inlets**

The fire Brigade breeching inlets shall consist of four 64mm internal diameter instantaneous male couplings for connection to the fire brigade pumps and the other two shall consist of 64mm internal diameter instantaneous male coupling.

Breeching inlet shall incorporate a 100 mm diameter flanged connection

The breeching inlet shall be located 1.0M to the center line of the box above ground level.

The breeching inlet shall be enclosed in a galvanized mild steel cabinet of suitable dimensions to contain all visible pipe work. A 7.5mm wire glass front shall be provided with 50 mm high, red lettering, DRY RISER BREECHING CONNECTOR. The remainder of the box is to be finished in fire red enamel paint.

## **Pipework**

The pipe work for the riser installation shall be galvanized Wrought Steel Tubing "heavy" Grade Class 'C' to B.S. EN 10255 with pipe threads to B.S. EN 10226 of 2005

## **Pipe Fittings**

The pipe fittings shall be wrought steel pipe fittings welded or seamless fittings conforming to B.S. EN 10241 of 2000 or malleable iron fittings to B.S. 193 of 1966.

All changes in direction will be standard bends or long radius fittings, No Elbows will be permitted.

## **Flanges**

The flanges shall comply with B.S. 4504 -3.1, 3.2: 1989. All flanges shall comply to a nominal pressure Rating of 16 bar (P.N.16) and shall be of either grey cast iron or steel.

## **Gaskets**

The gaskets for use with flanges to B.S. 4504 – 3.1., 3.2 of 1989 with B.S. EN 1514-1, 1997 for pressures up to 64 bar.

### **Air Relief Valves**

The Dry riser shall terminate 1M above the third floor landing valve with an air relief valve as Glenfield No. 1260 ‘Apex’, the valve construction shall be of melanite iron grade E conforming to B.S. 1452 Grade 1.4. Float Guide and Seat Ring shall be of A.B.S Plastic with seal ring of molded rubber. Maximum working pressure of the valve is to be 16 bar.

### **Sleeves**

Where pipework pass through walls, or floors or ceiling a sleeve shall be provided one diameter larger than the diameter of the pipe the space between to be the packed with mineral wool, to the Engineers approval.

### **Floor and Ceiling Plates**

Where pipe pass through floors, walls and ceilings, floor, walls and ceiling plates shall be secured around the pipe. The plates shall be of stainless steel construction and will serve no other purpose than to present a neat finish to the exposed installation.

### **Finish Painting**

Upon completion of testing and commissioning of the dry riser installation the pipe work shall be primed and finish paint with 2 No. Coats of paint by the Sub-contractor to the Architect’s requirements.

### **Testing and Commissioning**

The installation is to be tested to one and half times the working pressure of the installation all to the approval of the Engineer. The Sub-contractor shall arrange at his own expense for acceptance and approval by the Chief Fire Officer of the Siaya County. Failure to gain approval by the Officers of the Fire Brigade will be the full responsibility of the Sub-Contractor who shall at his own expense carry out such works that are necessary to gain acceptance of the installation by the Officers of the Siaya County Fire Brigade.

### **Instruction Period**

The Sub-Contractor shall allow in his sub-contract sum for instructing of the use of the equipment to the Clients maintenance staff. The period of the instruction may be within the sub-contract period but may also be required after the sub-contract period has expired.

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

### **Canvas Hose**

The canvas hose shall be 65 mm diameter 30:00m long designed for a bursting pressure of 34 bar. The canvas hose shall have attached instantaneous hose coupling branch pipes and nozzle to B.S. 336:1965. All to be manufactured by Angus of Pressure Flex Type or equal and approved.



### **Hose Cradle**

The hose cradle shall be a high quality fitting designed for use in public buildings, the cradle shall be made in aluminum throughout and shall be supplied with wall bracket and the finish shall be polished or chrome plated all as Baileys Ensign Model 241 or equal and approved.

## **4. SPECIFICATIONS FOR FIRE FIGHTING HOSE REEL SYSTEM**

### **4.1 General**

The particular specification details the requirements for the supply, installation and commissioning of the hose reel installation. The hose reel installation shall comply in all respects to the requirements set out in C.O.P. 5306 Part I: 2006 B.S. 6041 1980 and B.S. EN 6761 1995. The system shall comprise of a pumped system for hose reels on all floors.

The Sub-contractor shall include for all appurtenances and appliances not necessarily called for in this specification or shown on the Sub-contract Drawings but which are necessary for the completion and satisfactory functioning of the works.

No claims for extra payment shall be accepted from the Sub-contractor because of his non-compliance with the above requirements.

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

### **Scope of Works**

The Sub-contractor shall supply, deliver, erect, test and commission all the Automatic Fire Fighting hose reel installation which is called for in this Specification and shown on the Sub-contract Drawings listed in the drawing schedule.

In connection with the above the works sub-contractor shall liaise fully with the Plumbing Sub-contractor who will be responsible for making a new connection to the existing water mains, supplying and laying metered services pipe, up to making connections to the water tank.

The Sub-contractor shall install all the electrical pumps called for this Sub-Contract.

The Sub-contractor shall handover to the electrical Sub-contractor all the electrical control gear for installation. The electrical Sub-Contract shall supply electrical power, inter- connecting cabling and wiring to the hose reel installation.

The Sub-contractor shall supply and handover all the wiring and control diagrams necessary for the works when required to do so.

Though the electrical Sub-contractor shall install starting and stopping gears, supply and install indications equipment and be responsible for the electrical connections in compliance with electrical regulations, the Sub-contractor for the works contained in this document shall retain full responsibility for the correct functioning of the installation.

## **Fire Hose reel Pumps**

The fire hose reel pumps shall consist of a duplicate set of hobby booster pumps complete with pressure tank, control panel with low voltage circuitry, pressure switch, pressure gauge, pipe work and valves. Control shall be affected via the pressure switch through the control panel which shall give automatic changeover from duty to standby pump, should the duty pump fail to deliver for any reason.

The whole unit shall be supplied completely assembled and tested on a common framework with all necessary gate valves, test cocks and non-return valves. The pressure switch shall be set to suit the prevailing site conditions.

Hose reel pumps as Dayliff Pressure set complete with Dailiff DB 12 - 50 horizontal multistage centrifugal pump, ONE DUTY THE OTHER STANDBY complete with a 2.82kW 3 ph. 2900rpm squirrel cage motor, 1 No GWS60 pressure vessel, 1 No pressure gauge, 1 No pressure switch all mounted on a steel base with terminal set for variable speed operation. The pressure set will be complete with the inlet and outlet manifold terminating with a valve, all frame mounted and pre-wired. Each pump is capable of delivering up to 7m<sup>3</sup>/hr at 45m or equal and approved. The pump shall be BMS compatible, or equal and approved.

### **Control Panel**

The control panel is to be located in the position indicated on the Sub-contract Drawings.

The control panel shall be constructed of mild steel, be moisture, insect and rodent proof and shall be provided complete with spare fuses and wiring diagram enclosed in plastic laminate.

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

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

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

### **Hose reels**

The hose reels to the installation shall consist of automatic swinging hose reels manufactured to BS EN 671-1 1995.

The hose reels shall be supplied and installed complete with first-aid non-kinking rubber hose 45 Meters long, with nylon spray/jet/shut-off nozzle fitted. The orifice to the nozzle is to be not less than 4.8mm to maintain a minimum flow of 0.41/s to the jet.

The hose reels shall be supplied complete with 25 mm screw down chrome-plated globe valves to BS 1010 to the 1" BOP inlet to the reels, steel wall mounting plates and brackets, union connections, hose guides, plastic instruction plate and all fittings necessary for installation.

The hose reels shall be installed at 1.5 meter center above the finished floor level in locations shown on the Sub-contract Drawings, and where they will not cause an obstruction to personnel leaving the building in the event of fire.

### **Pipe work**

The pipe work for the hose reel installation shall be galvanized wrought steel tubing "Medium Grade" Class 'B' to B.S. EN 10255 with pipe threads.

### **Pipe Fittings**

The pipe fittings shall be wrought steel pipe fittings welded or seamless fittings conforming to B.S. EN 10241- 2000 or malleable iron fittings to B.S. EN 10242-1995.

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

### **Flanges**

The flanges shall comply with B.S. 4504 – 3.2, 3.1 of 1989. All flanges shall comply with a nominal pressure rating of 16 bar (P.N.1.6) and shall be either cast iron or steel.

### **Gaskets**

The gaskets for use with flanges to B.S. 4304:1969 shall comply with B.S. EN 1514-1, 1997 for pressure up to and not exceeding 64 bars.

### **Non-Return Valves**

The non-return valves up to and including 80 mm diameter shall be as Glenfield No. 5003 to B.S. EN 12334 - 2001 with flanges to B.S. 4504 – 3 – 31, 3-3.2 of 1989.

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

### **Gate Valves**

The gate valves up to and including 80 mm shall be as Crane No. D151 non-rising stem and wedge disc to B.S. 1952-1964 (B.S. 5154:1974) with screwed threads to B.S. 21 taper thread. The valves shall be of high grade bronze construction.

Gate valves exceeding 80 mm and up to 300 mm shall be as Glenfield .R. Sgate valve 3500 series to B.S. 5163 with flanges to B.S. 4504 PN 16. The valve is a double flanged cast iron wedge gate valve for water works purposes with meehanite cast iron body to B.S. 5685 Part 1 -

4 with rubber covered meehanite cast iron gate. The stem is to be forged Stainless Steel to B.S. EN 10085 of 2001 with Meehanite cast iron hand wheel.

### **Sleeves**

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

### **Floor and Ceiling Plates**

Where pipe work passes through floors, walls and ceilings, floor, wall and ceilings plates shall be secured around the pipe. The plates shall be of stainless steel construction and will serve no other purpose than to present a neat finish to the exposed installation.

### **Earthing**

The hose reel pipe work system shall be electrically earthed by a direct earth connection. The installation of the earthing to be carried out by the Electrical Sub-contractor.

### **Testing and Commissioning**

The hose reel installation is to be flushed out before testing to ensure that no builders' debris has entered the system. The installation is to be then tested to one and a half times the working pressure of the installation all to the approval of the Engineer simulated fault condition of the pumping equipment is to be carried out before acceptance of the system by the Engineer and Architect.

### **Finish Painting**

Upon completion of testing and commissioning of the Hose reel installation the pipe work shall be primed and finish painted with 2 No. coats of paint by the Sub-Constructor to the Architect's requirements.

### **Instruction Period**

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

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

## **5. SPECIFICATION FOR PORTABLE FIRE EXTINGUISHERS**

### **5.1 General**

The particular specification details the requirements for the supply and installation and commissioning of the Portable Fire Extinguishers which shall conform to B.S. Part 1 -6

EN3 of 1996 and BS 7867 of 1997. The Sub-Contractor shall include for all appurtenances and appliances not necessarily called for in this specification or shown on the Sub-contract Drawings but which are necessary for the completion and satisfactory functioning of the works.

If in the opinion of the Sub-Contractor there is a difference between the requirements of the specification and the Sub-contract Drawings, he shall clarify these differences with the Engineer before tendering.

### **Scope of Works**

The Sub-Contractor shall supply, deliver, erect, test and commission all the portable fire extinguishers which are called for in this specification and shown on the Contact Drawings and listed in these Bills of Quantities.

### **Water/CO2 Extinguishers**

The portable 9-litre water filled CO2 cartridge operated portable fire extinguishers shall comply with B.S. ISO 1382 of 2012 and to the requirement of B.S. Part 1 -6 EN3 of

1996 and BS 7867 of 1997. Unless manufactured with stainless steel, bodies shall have all internal surfaces completely coated with either a lead tin, lead alloy or zinc applied by hot dipping. There shall be no visibly uncoated areas.

The extinguishers shall be clearly marked with the following:

- (a) Method of operation
- (b) The words 'WATER TYPE' (GAS PRESSURE) in prominent letters.
- (c) Name and address of the manufacturer or responsible vendor.
- (d) The nominal charge of the liquid in imperial gallons and litres.
- (e) The liquid level to which the extinguisher is to be charged.
- (f) The year of manufacture
- (g) A declaration to the effect that the extinguisher has been tested to a pressure of 350 lb./sq. in (24,1 Bar).
- (h) The number of the British Standard B.S. ISO 1382 of 2012 or B.S. Part 1 -6 EN3 of 1996 and BS 7867 of 1997.

### **5.03 Portable Carbon Dioxide Fire Extinguishers**

The portable carbon dioxide fire extinguishers shall comply with B.S. Part 1 -6 EN3 of 1996 and BS 7867 of 1997.

The body of the extinguishers shall be a seamless steel cylinder manufactured to one of the following British Standards, B.S. EN 1288 of 2000.

The filling ratio shall comply with B.S. 341. Where a hose is fitted it shall be flexible and have a minimum working pressure of 3000 lb./sq. in (206.85 bar), the hose is not to be under internal pressure until the extinguisher is operate

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

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

The following and markings shall be applied to the extinguishers:

The words 6kg carbon dioxide fire extinguishers and to include the appropriate nominal gas content.

(a) Method of operation

(b) The words “Re-charge immediately after use”

(c) Instructions for periodical checking.

(d) The number of the British Standard B.S. ISO 1382 of 2012 or B.S. Part 1 -6 EN3 of 1996 and BS 7867 of 1997.

(e) The manufactures name or identification markings.

### **Dry Powder Portable Fire Extinguishers**

The portable dry powder fire extinguishers shall comply with B.S.3465 : 1962 and B.S.5423. The body shall be constructed of steel not less than the requirements of B.S. 14449 of 2006 or aluminum to B.S EN 515, of 1993 and shall be suitably protected against corrosion.

The dry powder charge shall be non-toxic and retain its free flowing properties under normal storage conditions. Any pressurizing agent used as an expellant shall be in dry state; in particular compressed air.

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

The extinguisher shall be clearly marked with the following information:

a) The words “Dry Powder Fire Extinguisher”

b) Method of operation in prominent letters

c) The working pressure and the weight of the powder charge in kilograms.

d) Manufactures name or identification mark.

e) The words ‘RECHARGE AFTER USE ‘if rechargeable type.

f) Instructions to regularly check the weight of the pressure container (gas cartridge) or inspect the pressure indicator on stored pressure types when fitted, and remedy any loss indicated by either.

- g) The year of manufacture
- h) The pressure to which the extinguisher was tested.
- i) The number of the British Standard B.S. ISO 1382 of 2012 or B.S. Part 1 -6 EN3 of 1996 and BS 7867 of 1997.
- j) When appropriate complete instructions for charging the extinguisher shall be clearly marked on the extinguisher or otherwise be supplied with the refill.

### **Fire Blanket**

The fire blanket shall measure 910 \* 910 mm and shall be fitted with Special tapes folded so as to offer instantaneous single action release blanket from storing

## **6. SPECIFICATIONS FOR SANITARY FITTINGS AND ACCESSORIES**

### **6.1 Water Closet (WC) (A)**

Water closet as Twyford Alcona btw horizontal outlet Vitreous China, white to B.S. 3402, or approved equivalent

#### **Specifications**

The water closet shall be floor fixed, so as to be against the wall and 520mm long by 390mm high. The water closet shall be suitable for use with flashing valve ref Model 150-1.6.

The water closet shall be complete with the following.

- (i) Water closet bowl horizontal outlet No. 52050XX0
- (ii) Seat and Cover No. AR7853WH

### **6.2 Water Closet (WC) (B)**

Water closet as Twyford e100 standard round close coupled 6l cistern, horizontal outlet Vitreous China, white to B.S. 3402, or approved equivalent.

#### **Specifications**

The water closet shall be Vitreous China White to BS 3402 floor fixed with cistern against the wall and total length from the wall being 670mm, and the bowl seat and cover being

390mm high. The water closet shall have chrome plated fittings. The water closet shall be complete with the following.

- (i) Water closet bowl horizontal outlet No. 52050XX0.
- (ii) 6 litre cistern and fittings with push button – E12590WH
- (iii) Seat and Cover No. E17857W

### **6.3 Water Closet Flushometer**

**Description**

This shall be a concealed water closet Flushometer for Olympia BTW bowl, Sloan Optima Systems model 150-1.6 or equivalent. It shall be low water consumption approximately 6 litres per flush as manufactured by Sloan Company or other approved make.

**Specification.**

The flushometer shall be quiet, concealed, adjustable piston type, rough brass closet flushometer for either left or right hand supply with the following features:

- Metal non-hold open push button
- Self-cleaning Expellor by-pass
- 25mm I.P.S wheel handle bak-chek™ Angle stop
- Adjustable Tailpiece
- Vacuum Breaker flush connection
- 25mm female I.P.S. union outlet (no flush connection)
- Exposed parts chrome plated

Valve body, cover, tailpiece and control stop shall be in conformance with ASTM Alloy Classification for Red Brass. Valve shall be in compliance to the applicable sections of ASSE 1037, ANSI/ASME 112.19.6, AND Military specifications V-29193

**6.4 Electronic Hand Washing Faucet****Description**

Sensor operated 100mm Centre-Set Electronic Hand Washing faucet for tempered or hot/cold application.

**Flow rate**

Model ETF-600C (8.3 Lpm max) Laminar floor spray head

**Specifications**

ADA Compliant, sensor activated, 24 VAC, Chrome Plated 100mm Center set brass, hand washing faucet with the following features:

- Splash-proof circuit control module
- Sensor range adjustment screw
- Trouble shooting LED indicator lights
- User friendly variable time out settings
- Filtered solenoid valve with serviceable “Y” strainer filter
- 240 VAC/24 VAC Transformer (Plug-in or Box Mount)
- Metal jacket wire protection for sensor and solenoid leads
- Modular quick-release sensor and solenoid connections

**6.03.2.2 Accessories**



- □ EL-342 240 VAC/24 VAC 50/60Hz (50 VA) – Box mount (will operate up to 3 ETF-600 faucets) Mixing Valves
- □ Mix -70-A Thermostatic mixing valve for multiple faucets

## 6.5 Urinal Flushometer

### Description

These shall be as concealed sensor operated urinal flushometer, Sloan Optima model 195-0.5

ES-S (1.5lpt), for wall hung back spud urinals, or equivalent and approved. They shall be low water consumption approximately 1.5 litres per flush.

### Specifications

- The flushometer shall be quiet concealed diaphragm type rough brass with the following features:-
- Dual Filtered By-Pass
- OPTIMA® EL-1500 Self Adaptive Infrared Sensor with Indicator Light
- Non-Hold-Open Integral Solenoid Operator
- Chrome Plated Wall Cover Plate (for 2-gang Electrical Box) with Vandal Resistant Screws
- 20mm I.P.S. Wheel Handle Bak-Chek™ Angle Stop
- Sweat Solder Adapter
- Adjustable Tailpiece
- High Back Pressure Vacuum Breaker Flush Connection and Spud Coupling for 20mm Concealed Back Spud.
- Valve Body, Cover, Tailpiece and Control Stop shall be in conformance with ASTM Alloy Classification for Semi-Red Brass. Valve shall be in compliance with the applicable sections of ASSE 1037, ANSI/ASME A112. 19.6 And Military specification V-29193. Installation conforms to ADA requirements.

### Electrical specifications

#### Control Circuit

- Solid State
- 24V AC Input
- VAC Output
- sec. Arming Delay
- Hours Sentinel Flush

#### Optima Sensor Range

- Nominal 15”-30” (381-762mm)
- Self-adaptive Window: ± 8” (203mm)

#### 6.04.3.3 Solenoid Operator

- 24 VAC, 50/60 Hz

#### Transformers

- Sloan Parts #EL- 342
- 120 VAC, 50/60 Hz Primary

- 24 VAC, 50/69 Hz Secondary
- Class II, UL Listed
- 50 VA

One Transformer shall be capable of serving upto ten (10) OPTIMA Closet/Urinal Flushometers.

## **6.6 Urinal Bowl**

### **Description**

The urinal shall be as Twyford's Spectrum single bowl type, rear spud vitreous China White in colour, or equal and approved.

### **Specification**

The Twyford's Spectrum urinals shall have rear spud to fit 20mm ( $\frac{3}{4}$ "') flushometer as described connecting inlet pipe. It shall be 610mm above the floor level and 360 mm wide, by 560mm long. The material shall be Vitreous China, White to BS 3402. The bowl shall be for single persons only, suitable for fitting to Urinal Flushometer as described in Part C part C2/5. The bowl shall be complete with fixing kit and outlet connector.

## **6.7 Wash Hand Basin (WHB)**

### **Description**

The wash hand basins shall be as Twyford's Entice 570 countertop size 570mm x 425mm with one tap hole, and shall be in white Vitreous China or equal and approved.

### **Specification**

The Twyford's Capricorn countertop 570 x 425 mm shall be white in colour and in Vitreous China to BS 3402. They shall be supplied with fixing template and fixing instruction. They shall be supplied complete with chrome plated 75mm seal bottle p-trap, as Twyford's No. 54463 CP2, waste as Twyford's No. 54341 CPO, and extension pipe to wall with wall flange No. 54467CPO, all chrome plated.

## **6.8 Surface Mounted Automatic Hand Dryer Bobrick Model B-748 Or Equivalent**

### **Description**

Surface Mounted Automatic Hand Dryer shall be as Bobrick model B-748, Eclipse, with chrome plated cover, 208-230 volts, 9-10 AMP, 1900 - 2300 watts 50/60 Hz, single phase or equal and approved.

### **Specification**

Surface-mounted hand dryer shall have a one-piece, deep-drawn steel cover with bright polished chrome plated finish. Motor shall be 80 watts, universal type with sealed ball bearing at drive end and self-lubricating sleeve bearing at non-drive end; equipped with automatic thermal-overload switch. Heating element shall be located on inlet side of fan, and shall heat air without hot spots, be inaccessible to vandals and shall be protected by a thermal fuse. Electronic sensor shall automatically turn dryer on when hand is held under air outlet opening and across the path of sensor. Dryer will turn off

automatically when hands are removed. Sensor shall automatically shut dryer off approximately 1½ minutes after dryer turns on if an inanimate object is placed across air- outlet opening. After inanimate is removed, electronic sensor shall automatically reset itself and dryer shall operate normally. Units shall be UL/c-UL listed (208-230 V, AC Model, and VDE approved and CE marked). Unit shall be protected by a limited 10-years warranty on all parts except motor brushes. Motor brushes shall be warranted for three years from the date of installation.

The surface-mounted automatic hand dryer with chrome-plated cover is 240 Volts, AC, 9-10 Amp, 1900-23000 watts, 50 Hz, Single phase mounted at 1150mm above the floor for men's WC, 1100mm above the floor for women's washrooms, and as follows below for children.

- Ages 3 - 9, 795mm above the floor
- Ages 9-12, 895 mm above the floor
- Ages 12-15, 995 mm above the floor
- Ages 15-18, 1110 mm above the floor
- For barrier-free Design the dryers shall be 945mm above the floor.

## **Materials**

### **Cover**

Cover shall be of bright polished chrome plated finish. The cover is secured to mounting base by a retaining bracket and to the air inlet/outlet grill by a single concealed locking screw.

### **Air inlet/outlet grill**

Vandal-resistant ,pressure die-cast aluminum, includes infrared sensor and operational graphics. The grill is fixed to the mounting base by two screws and to the cover by one screw.

### **Mounting base**

The mounting base shall be 16 gauge (1.6mm thick) plated-steel with three 6mm diameter mounting holes and one 22mm diameter hole for electrical supply wiring.

### **Fan**

The fan shall be dynamically balanced, single inlet, direct airflow in a wide band through heating element at 3m<sup>3</sup>/Min.

### **Motor**

The motor shall be universal 80W, 6200 rpm with sealed ball bearing at drive shaft end and self-lubricating sleeve bearing at none drive end. The motor shall be equipped with automatic thermal overload switch.

### **Heating Element**

Coiled nickel-chrome wire shall be mounted on mica formers and protected by a thermal fuse. Black, injection moulded ABS element housing shall be mounted on the fan inlet and shall heat air without hot spots inaccessible to vandals.

### **Electronic control**

The electronic control shall be infrared automatic sensor which shall automatically turn dryer on when hands are held under air-outlet opening and across path of sensor. The dryer shall stop when hands are removed from the path of sensor. Electronic sensor shall have automatic shut off approximately 1½ minutes after dryer turns on if an inanimate object is placed across sensor lens. The electronic sensor shall reset itself automatically and shall operate normally when the inanimate object is removed.

### **Operation**

No-touch operation: electronic sensor shall automatically turn dryer on when hand is held under air-outlet opening and across path of sensor. Remove hand and dryer shall stop. Dryer will not stop by itself before user is satisfied hand are dry. Dryer shall operate only when actually drying hand which saves energy and operating costs. Electronic sensor will automatically shut dryer off 1-1/2 minutes after dryer turns on if an inanimate object, such as tape or chewing gum, is placed across air- outlet opening. After inanimate object is removed, electronic sensor shall automatically reset itself and dryer shall operate normally.

### **Installation**

Wall preparation:

Secure mounting base on wall using template provided. For masonry, provide three No. 10 expansion shields or anchors and secure with No. 10 (4.8) sheet metal screws (not furnished). For plaster or dry wall construction, provide concealed backing to comply with local building codes and secure with No. 10 x 1-3/4 (4.8 x 45mm) or longer, round-head sheet-metal or 3/16" 5mm) toggle bolts (not furnished). Provide electrical service from nearest distribution panel to dryer mounting base in conformance with local electrical codes.

## **6.9 Pipe Supports Inside the Ceiling for Pipes of 100mm Diameter and Above.**

### **Description**

The pipes of 100mm and above shall be supported using supports as HILTI MP- MI heavy duty screw-Clamping pipe ring, deep galvanized with rubber inlay of material EPDM, or equal and approved.

### **Specifications**

The heavy duty clamping ring shall have M8 clamping screws, secured against loss with combination cross recess in head. The clamp shall be used on pipes of up to maximum 267mm diameter and shall be able to withstand maximum force of 5000N.

The MP-MMI heavy duty screw – clamping pipe ring shall use as support MFP fixed point comprising the following:-

- (i) MFP-BP20, basic set (Sealing brackets and hanging bolts), Item No. 247827/9
- (ii) MFP-AP2 bracing set (Set of four shoe brackets) - Item No. 247830/3
- (iii) A set of tie rods

For this combination of pipe support the minimum and maximum height of ceiling above the pipe shall be 140mm – 1200mm. This arrangement of pipe support shall prevent pipe movement when subjected to forces.

#### **6.10 Pipe Supports Inside the Ceiling for Pipes Below 100mm Diameter.**

##### **Description**

The pipe of diameter below 100mm shall be supported using supports as HILTI MPN-SI pipe ring, standard duty, deep galvanized with double connection boss thread M8/M10, or equal and approved.

##### **Specification**

The pipe ring shall be for pipes of up to 75mm diameter with maximum static load of 2000 N. It shall be non-slip with rubber inlay of material EPDM, clamping screws secured against loss with combination cross recess in head

#### **6.11 Wash Hand Basin For Handicapped Person (For Wheel Chair Lavatory)**

##### **Description**

The Morningside Wheelchair Lavatory type, wash hand basin, shall be white vitreous China, as Kohler Model K-12638R, or equal and approved.

##### **Specifications**

The wash hand basin shall be as Kohler Morningside wheelchair Lavatory type; 508 mm in length and 686mm in width, single hole with overflow and soap dispenser hole on the right, made from premium materials that withstand high volume usage, it shall be drilled for concealed arm carrier. It shall have 35mm diameter spout and

32mm diameter soap dispenser. It shall be fixed at 700mm above the floor or as instructed by the Engineer.

#### **6.12 Gate Valves**

These shall be screw wedge type gate valves for manual operation by cap to close clockwise. They shall be made of material such as cast iron – BS EN 1452 - 1999 GR 260, Ductile iron – BS EN 1563-1977, Gun metal – BS 1400 1980 LG 2-C.

The valves for our case shall be rated 16 bars, model No. 3403 - 1972, 300mm nominal diameter, as Glenfield to BS 5163 - 2004, or equal and approved. The valve assemblies shall be protected internally and externally by black bituminous coating applied by a hot dip process.

#### **6.13 Washroom Accessories**

The washroom accessories described below shall be as Bobrick, details available at website [www.bobrick.com](http://www.bobrick.com), or equal and approved.

The list of the accessories and their mounting heights shall be as or about as indicated in drawings No. A851, A852, A853 and A854 of the Architectural Drawings Provided.

## **6.14 Tissue Dispensers**

### **Recessed Bathroom Tissue Dispenser (or Recessed Facial Tissue Dispenser) (TA -1)**

The Recessed Facial Tissue Dispenser shall have type 304 22 gauge stainless face plate (snaps off for filling) with satin finish. The cabinet shall have heavy gauge galvanized steel. The unit shall hold one box of 100 two-ply facial tissues. The dispenser shall be 300mm overall width and 155mm overall height of the frame, lipped on to the wall surface by 20mm. The cabinet shall be 260mm wide and 125mm high and 55mm deep. The sub-contractor shall allow 275 x 135mm rough wall opening, 65mm recessed depth minimum. The said dispenser shall be as Bobrick Model B-3552 or equal and approved.

### **Single Jumbo –Roll Surface Mounted Toilet Tissue Dispenser (TA – 1A)**

Single Jumbo Roll Tissue Dispenser shall have satin finish stainless steel equipped with spring lock. The spindle shall hold 255mm diameter roll with 75mm diameter core. Convertible for 70mm and 40mm diameter core rolls. It shall have powder- coated mounting plate, slot reveals tissue supply, and the unit shall be 270 x 270 x 115mm diameter. The unit shall have a mounting height of 750mm. It shall be as Bobrick Model B2890 or equal and approved.

### **Recessed Toilet Tissue Dispenser (TA -1B) – Executive Washroom**

The recessed Toilet Tissue Dispenser shall be constructed of type 304 22 gauge stainless steel with satin finish. It shall be 155mm wide by 155mm high with a recessed depth of 50mm, and spindle being 50mm from the wall. The recessed shell and Flange shall be drawn, one piece, seamless construction. The spindle shall be chrome plated and shall be equipped with heavy duty internal spring and shall be theft resistant. The unit shall be furnished with plated steel mounting clamp for stud wall construction. The fastening screws shall have heads to fit counter sunk mounting holes on the mounting bracket. The unit shall have a mounting height of 560mm from the floor

The recessed toilet paper dispenser shall be as Bobrick model B-6677.60, or equal and approved.

## **6.15 Sanitary Disposals**

### **6.14.1 Recessed Sanitary Napkin Disposal (TA -3)**

Recessed Sanitary Napkin Disposal shall be 304 stainless steel with all-welded construction, and exposed surfaces shall have satin finish. The flange shall be gauge 22 stainless steel with satin finish. The disposal shall be 275mm wide and 435mm high with a mounting height of 760mm. It shall be fitted into a rough wall opening of 285 x 395mm. The recessed sanitary Napkin Disposal shall be as Bobrick Model No. B 353, or equal and approved.

### **6.14.2 Surface Mounted Sanitary Napkin Disposal (TA -3A)**

The surface mounted sanitary napkin disposal shall be type 304 gauge 22 stainless steel with all welded construction, all exposed surfaces shall have satin finish. The unit shall be 270mm wide and 385mm high, and 105mm deep, mounted on the wall surface at a mounting height of 760mm. The unit shall be as Bobrick Model B -254 or equal and approved.

## **6.16 Grab Bar (Rails) (TA-6, TA-6A)**

Grab bars shall be type 304 stainless steel with satin finish. Grab bar shall have 18 gauge (1.2mm) wall thickness and 32mm outside diameter. Clearance between the bar and the wall shall be 38mm. Concealed mounting flanges shall be 3mm thick stainless steel plate 50 x 80mm, and equipped with 2 screw holes for attachment to the wall. Flange cover shall be 22 gauge stainless steel 85mm diameter and shall snap over mounting flanges, to conceal mounting screws. There shall be 2 grab bars, one behind WC and the other one on the sides, either right or left. The one behind the WC shall be about 900mm and the one on the side shall be as 1200mm. The bar shall be at a mounting height of 790mm above the finished floor level. The grab bars shall be as Bobrick Model B-5806 series or equal and approved.

## **6.17 Soap Dispenser's (TA -7)**

### **6.16.1 Lavatory / Countertop Soap Dispenser**

The Lavatory/Countertop Soap Dispenser shall dispense commercially marketed all-purpose hand soaps. Piston and spout assembly shall be type 304 stainless steel with bright polished finish. Escutcheon shall lock to body with concealed locking mechanism that is opened only with special key provided. Spout shall rotate 360° without damage to valve mechanism. Piston, spout and supply tube assembly shall be removable from top for filling and maintenance. Valve shall be equipped with plastic cylinder, stainless steel spring, U-packing seal, and duct bills. Shank shall accommodate mounting thickness of up to 25mm. Translucent shatter – resistant polyethylene container shall have a capacity of 0.6 l; and shall be as Bobrick Model No. B-8221, or equal and approved.

### **6.16.2 Vandal Resistant Soap Dish (TA -7A)**

Vandal Resistant Soap Dish shall be extra heavy chrome plated cast bronze, with exposed surfaces having bright polished finish. The unit shall be furnished with Tamper Resistant mounting screws. The unit shall be 125mm long x 45mm wide for the dish, and including the wall mount portion it shall be 75mm wide from the wall. The vandal resistant soap dish shall be as Bobrick Model No. B-973 or equal and approved.

## **6.18 Surface Mounted Automatic Hand Dryer**

The surface mounted Automatic Hand Dryer shall be of stainless steel construction and mounted on the wall at a mounting height of about 1100mm above the floor level. Detailed description has been done elsewhere in this document. It shall be single phase 240V, 50Hz.

## **6.19 Shower Curtain Rods (TA -13)**

The shower curtain rods shall be type 304, 20 gauge stainless steel with satin finish. It shall have an outside diameter of 25mm. Flanges shall be 35mm diameter, chrome plated plastic with bright polished finish. The units shall be equipped with aluminium concealed mounting brackets. The rod shall be of length 915mm and shall be cut to fit the space available. The unit shall be as Bobrick Model No. B-207, or equal and approved.

## **6.20 Extra Heavy-Duty Towel Bar With Concealed Mounting Polished End, Peened Grip (TA-15)**

The towel bar shall be type 304 stainless steel gauge 18 with peened surface. The ends of the towel bar shall be bright polished to match plumbing trim. The bar shall be 32mm outside diameter. Clearance between the towel bar and wall shall be 38mm. Concealed flanges shall be 3mm thick stainless steel plate 50 x 80mm, and equipped with 2 screw holes for attachment to wall. Flange covers shall be 22 gauge stainless steel 85mm diameter and shall snap over mounting flanges to conceal screws. The towel bar shall be about 610mm long centre to centre. When installed the bar shall withstand a support loads of 408 kg. The unit shall be as Bobrick Model No. B-550, or equal and approved.

#### **6.21 Coat Hook With Bumper (Ta-16)**

The coat hook shall be constructed of solid cast aluminium with matte finish. Unit shall be equipped, with hard rubber bumper, secured with drive screw. The coat hook shall be fixed on the door and shall have overall length of 95mm. The unit shall be fixed to the door using 4 screws into counter sunk screw holes on the base. The coat hook with Bumper shall be as Bobrick Model B-212 or equal and approved.

#### **6.22 Surface- Mounted Door Bumper (Ta -17)**

The surface-mounted door bumper shall have base constructed of type 304 22 gauge stainless steel with bright polished finish. The unit shall be equipped with black neoprene bumper, secured on to black nylon post by a screw. The base of the unit shall be 50mm square with overall height of 55mm. The unit shall be as Bobrick Model No. 687 or equal and approved.

### **7. SPECIFICATION FOR TANKS AND PUMPS**

#### **7.1 Pressed Steel Tanks**

Pressed steel tanks shall be mild steel sectional 12m<sup>3</sup> water storage tanks, comprising of 1m square modular steel panels bolted together on site. The panels are cold pressed at the centre to provide strength and rigidity of the tank.

Hot rolled sections shall conform to BS 4360 Grade 43A, cold formed sections to BS 5950. Part 5 1997, bolts and nuts to BS 3692 and BS 4190, welding Specification to BS 5135 and welding Electrodes to BS 639 or equivalent.

Inside the tank shall be painted two coats of BLACK BITUMINOUS paint. Outside the tank shall be painted one coat of ZINC PHOSPHATE PRIMER and one coat of SILVER ALUMINIUM.

#### **Transfer Pumps and Fire Hose reel pumps**

The pumps shall consist of a duplicate set of hobby booster pumps complete with pressure tank, control panel with low voltage circuitry, pressure switch, pressure gauge, pipe work and valves. Control shall be affected via the pressure switch through the control panel which shall give automatic changeover from duty to standby pump, should the duty pump fail to deliver for any reason.

The units shall be supplied completely assembled and tested on a common framework with all necessary gate valves, test cocks and non-return valves. The pressure switch shall be set to suit the prevailing site conditions.



Transfer pumps shall be as Dayliff Pressure set DB 12 - 50 horizontal multistage centrifugal pump, ONE DUTY THE OTHER STANDBY complete with a 2.82kW 3ph 2900rpm squirrel cage motor, 1 No GWS60 pressure vessel, all mounted on a steel base with terminal set for variable speed operation. The pressure set will be complete with the inlet and outlet manifold terminating with a valve, all frame mounted and pre-wired. Each pump is capable of delivering up to 7m<sup>3</sup>/hr at 45m head, or equal and approved. The pump shall be BMS compatible. The control panel shall be constructed of mild steel, be moisture, insect and rodent proof and shall be provided complete with spare fuses and wiring diagram enclosed in plastic laminate.

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

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

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

### **Pressure Boosting Pumps**

Pressure boosting pump shall be fully integrated and compact with speed controller, pressure tank, sensors and non-return valve. The pump shall be self-priming water cooled multistage and quiet in operation. It shall have inbuilt current and temperature motor and dry run protection. The unit shall be constructed from high strength corrosion free composite. The pump shall come complete with simple to use control pad with pressure adjustment and alarm indicator light.

The pump shall be as Grundfos Scalar 2,50% delivering 8m<sup>3</sup>/10m head, 0.55kW, single phase, 240 volts, or equivalent.

## **GENERAL SPECIFICATIONS FOR BLACK WATER TREATMENT PLANT INSTALLATIONS**

### **Packaged Black Water Treatment Plant**

Supply, delivery install and commission a packaged black water treatment plant of capacity 75m<sup>3</sup> per day, at Jaramogi Oginga Odinga University of Science and Technology – Achiego Campus.

The above works to be carried out by a specialist contractor, and should have a full back-up system in the country (Kenya) The plant should be able to treat 75 m<sup>3</sup> per day of black water.

Estimated water re-cycling rate is 10litres/second.

The plant shall incorporate sludge, filtration pumps(duty/standby), AUTO bar screen coarse, oil and grease separator, fine screen, SILENT air blowers, suction pumps, disinfection dosing system etc.

The Unit to be complete with interconnecting pipes / fittings/valves and all the necessary controls.

### **Pre-treatment:-**

Bar Screen

1No. AUTO bar screen of 5mm

1No. Internals for Oil and grease Tank

### **Biological Treatment**

#### **Bio Reactor (MBR)**

The wastewater system should comprise of the following:-

1No. Plant should be packaged type modular design. Plant should be Designed for 75 m<sup>3</sup>/day flow rate. Bio media should be of high quality Supplier should be having local back up for servicing and should have at least three running plants of similar technology.

MBR tank should consisting of Aeration tank, settling tank and chlorination tank in Mild Steel FRP lined

1No. Chlorine dosing system

1Item. Plant associated piping and fittings including all the valves, nipples, couplings, connectors, joints etc as required in the running lengths of pipe work and also where necessary, for pipe fixing clips, holderbats plugged and screwed

### **Diffusers**

10No. Coarse bubble diffusers - Pressed PVC pipe with holes on the surface for air ejection with necessary accessories etc complete (for equalisation tank and final tank) Size - Equalisation tank, sludge holding tank - 90mmdia x 800mm long 8No. Fine pore diffusers - Long membrane of EPDM supported on PVC pipe secured at the ends by SS clams and construction with necessary accessories etc. Size - 90mmdia x 1000mm long

### **Raw effluent pumpset**

2No. Raw effluent pumpset. Duty 6 m<sup>3</sup>/h @ 12m head with level switch in sump size 600 x 600 x 600mm with perforated stainless steel grating. Power: 240V 50Hz. 1Ph. 1.0KW (grating & sump by MC). To transfer raw effluent from the equalization tank to Aeration / FMR tank

### **Control panel**

1No. Control panel for the plant consisting of power on, pump run and trip indicator lights, lights; ammeter; relays with over and under voltage protection, float switch for low water level cut-out, pressure switches

### **Electrical wiring**

1 Item - Associated electrical wiring from Control panels to the pumps motor terminals. (2 sets)

### **Air Blowers**

2No. Air blowers - 100 m<sup>3</sup>/h @ 0.5kg and to be complete with all the required accessories & connections - For equalisation tank, SHT, aeration tank

### **Wiring**

1 Item. Allow for all the electrical wiring to the raw effluent pumpset from local isolators

Note: Electrical supply shall be brought to within two metres of equipment.

### **Water tanks**

#### **Note:-**

Each bidder should give the capacities that they require for the below water tanks to be in RCC or Plastic

1No. 30m<sup>3</sup> Collection / Equalization tank RCC

1No.10m<sup>3</sup> Final treated water tank plastic to be done by the Main Contractor

1No. 5m<sup>3</sup> Sludge holding tank RCC to be done by the Main Contractor

### **Pressure gauge**

3No. Pressure gauge to be fitted as instructed by the Engineer

### **Air pipework:-**

1 Item - Allow for air pipework installation (uPVC or HDPE Pipes) complete with all the couplings, connectors, joints etc as required in the running lengths of pipework and also where necessary, for pipe fixing clips, holderbats plugged and screwed.

### **Instruments:-**

1Item-Level Switches for the Tanks & Pressure gauges

### **Testing & Commissioning**

Allow for setting to work, testing and commissioning

### **Instruction and Maintenance**

1 Item-Allow for instruction to the client staff the operation and maintenance of the Grey waste water treatment plant system and initial maintenance during the six months defects liability period.

### **Record Drawings**

1 Item-Allow for preparation of record (as installed) drawings, operation and maintenance manuals

### **Electrical Connections**

1 Set -Allow for all the Electrical wiring, Cables, Cable trays as required to be a part of the supply and to be done by an Electrician

### **Connections**

1 Item-Allow for liasing with main contractor, plumbing & electrical sub-contractor to in all areas that involves services to be connected to the Grey waste water treatment plant services.

### **Co-ordination:-**

1 Item-Allow for co-ordination / liasing with main contractor, plumbing & electrical sub-contractor project manager, client, Architect and Consultants to establish the plant and to run the plant successfully

### **Plant Commissioning**

Commissioning by the supplier will be deemed complete only when the Grey waste water treatment plant are inspected & certified by a Certified Authorised Grey waste water treatment plant Inspector

### **Guarantee & Maintenance**

1 Item-Allow for 1 year guarantee & ½ year maintenance including spares but excluding fuel for the Grey waste water treatment plant system

### **Testing**

1 Item-Allow for testing the pipework and equipment supplied under this contract to the satisfaction of the Engineers.

Sum - Any item not specified but necessary for the satisfactory installation and operation of the entire Grey waste water treatment plant system within this scope.to be specified.

Sr.No	Description	Connected Load	Working Load	KW/hr	Working hours	KW-hr/day (ie.) Units/day
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						<b>y</b>
1.	Sewage Lifting Pumps	0.5 HP X 2 = 1 HP	0.5 HP X 1 = 0.5 HP	0.373	16	05.97
2.	Sludge re-circulation pump	0.5 HP X 2 = 2 HP	0.5 HP X 1 = 0.5 HP	0.373	4	01.49
4.	Filter Feed Pump	1 HP X 2 = 2 HP	1 HP X 1 = 1 HP	0.746	16	11.94
5.	Submerged Air Blowers	1.5 HP X 2 = 3 HP	1.5HP X 2 = 3 HP	2.238	24	53.71
6.	Electronic Dosing ump	40W X 2 = 80 W	40W X 2 = 80 W	0.08	20	1.6
7.	Centrifuge	2HP X 1 = 2HP	2HP X 1 = 2HP	1.49	2	2.98
					Total:	77.69

## **SECTION X: SCHEDULE OF UNIT RATES**

### **SECTION X: SCHEDULE OF UNIT RATES**

- 1 The tenderer shall insert rates against the items in the following schedules and may add such other items as he considers appropriate.
- 2 The unit shall include for supply, transport, insurance, delivery to site, storage as necessary, assembling, cleaning, installing, connecting, profit and maintenance in defects liability and any other obligation.
- 3 The unit rates will be used to assess the value of additions or omissions arising from authorized variations to the sub-contract works.
- 4 Where trade names or manufacture's catalogue numbers are mentioned in the specification, the reference is intended as a guide to the type of quality of article or quality of material required .Alternative brands of equal and approved quality will be accepted.

**SCHEDULE OF UNIT RATES**  
 (Must be completed by the Tenderer)

ITEM	DESCRIPTION	QTY/UNIT	RATE (KSHS)
1	Supply and install		
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

## **SECTION XI BILLS OF QUANTITIES**

### **A) PRICING OF PRELIMINARIES ITEMS**

Prices will be inserted against item of preliminaries in the Sub-Contractor's Bills of Quantities and specification. These Bills are designated as Bill No.1 in this Section. Where the Sub-Contractor fails to insert his price in any item he shall be deemed to have made adequate provision for this on various items in the Bills of Quantities. The preliminaries form part of this Sub-Contract and together with other Bills of Quantities covers for the costs involved in complying with all the requirements for the proper execution of the whole of the works in the Sub-Contract.

The Bills of Quantities are divided generally into three sections:

#### **Preliminaries – Bill No.1**

Sub-Contractor's preliminaries are as per those described in section C – Sub-Contract Preliminaries and General Conditions of Sub-Contract. The Sub-Contractor shall study the conditions and make provision to cover their cost in this Bill. The number of preliminary items to be priced by the Tenderer has been limited to tangible items such as site office, temporary works and others. However the Tenderer is free to include and price any other items he deems necessary taking into consideration conditions he is likely to encounter on site.

#### **Installation Items – Other Bills**

The brief description of the items in these Bills of Quantities should in no way modify or supersede the detailed descriptions in the Sub-Contract Drawings, conditions of Sub-Contract and specifications.

The unit of measurements and observations are as per those described in clause 1.0 5 of the section C.

#### **Summary**

The summary contains tabulation of the separate parts of the Bills of Quantities carried forward with provisional sum, contingencies and any prime cost sums included. The Sub-Contract shall insert his totals and enter his grand total tender sum in the space provided below the summary.

This grand total tender sum shall be entered in the Form of Tender provided elsewhere in this document.



## **SPECIAL NOTES TO BILLS OF QUANTITIES**

1. The Bills of Quantities form part of the Sub-Contract documents and are to be read in conjunction with the Sub-Contract drawings and general specifications of materials and works.
2. The prices quoted shall be deemed to include for all obligations under the Sub-Contract including but not limited to supply of materials, labour, delivery to site, storage on site, installation, testing, commissioning and all taxes (including 14% VAT and 3% withholding tax).

In accordance with Government policy, the 14% VAT and 3% Withholding Tax shall be deducted from all payments made to the Tenderer, and the same shall be forwarded to the Kenya Revenue Authority (KRA).

3. All prices omitted from any item, section or part of the Bills of Quantities shall be deemed to have been included to another item, section or part thereof.
4. The brief description of the items given in the Bills of Quantities are for the purpose of establishing a standard to which the Sub-Contractor shall adhere. Otherwise alternative brands of equal and approved quality will be accepted.

Should the Sub-Contractor install any material not specified here in before receiving written approval from the Project Manager, the Sub-Contractor shall remove the material in question and, at his own cost, install the proper material.

5. The grand total of prices in the price summary page must be carried forward to the Form of Tender for the tender to be deemed valid.
6. Tenderers must enclose, together with their submitted tenders, manufacturer's brochures detailing technical literature and specifications of the equipment that they intend to offer. Where the brochure contains different models tenderers MUST clearly mark out the model they intend to offer by using a 'markpen'.

## **BILLS OF QUANTITIES**

## BQ-1

ITEM	BILL 1: PRELIMINARIES	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
1	Discrepancies Clause 1.02				
2	Conditions of Sub-Contract Agreement Clause 1.03				
3	Payments Clause 1.04				
4	Site location Clause 1.06				
5	Scope of Contract Works Clause 1.08				
6	Extent of the Contractor's Duties Clause 1.09				
7	Firm price contract Clause 1.12				
8	Variation Clause 1.13				
9	Prime Cost and Provisional Sum Clause 1.14 (insert profit and attendance which is a percentage of expended PC or Provisional Sum)				
10	Bond Clause 1.15				
11	Government Legislation and Regulations Clause 1.16				
12	Import Duty and Value Added Tax Clause 1.17 (Note this Clause applies for materials supplied only. VAT will also be paid by the sub-contractor as allowed in the summary page)				
13	Insurance company Fees Clause 1.18				
14	Provision of services by the Main contractor Clause 1.19				
15	Samples and Materials Generally Clause 1.21				
<b>Sub-Total Carried Forward to Page BQ - 3</b>					

ITEM	BILL 1: PRELIMINARIES	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
16	Supplies Clause 1.20				
17	Bills of Quantities Clause 1.23				
18	Sub-Contractor's Office in Kenya Clause 1.24				
19	Builder's Work Clause 1.25				
20	Setting to work and Regulating system Clause 1.29				
21	Identification of plant components Clause 1.3				
22	Working Drawings Clause 1.32				
23	Record Drawings (As Installed) and Instructions Clause 1.33				
24	Maintenance Manual Clause 1.34				
25	Hand over Clause 1.35				
26	Painting Clause 1.36				
27	Testing and Inspection – manufactured plant Clause 1.38				
28	Testing and Inspection – Installation Clause 1.39				
29	Storage of Materials Clause 1.41				
30	Initial Maintenance Clause 1.42				
31	Attendance Upon Tradesmen, etc. (Insert percentage only) Clause 1.58)				
<b>Sub-Total Carried Forward to Page BQ - 3</b>					

ITEM	BILL 1: PRELIMINARIES	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
32	Local and other Authorities notices and fees Clause 1.60				
33	Temporary Works Clause 1.63				
34	Patent Rights Clause 1.64				
35	Mobilization and Demobilization Clause 1.65				
36	Extended Preliminaries Clause 1.66 (see appendix on page C-24)				
37	Supervision by Engineer and Site Meetings Clause 1.67				
38	Allow for profit and Attendance for the above				
39	Amendment to Scope of Sub-contract Works Clause 1.68				
40	Contractor Obligation and Employers Obligation Clause 1.69 (see appendix page C-24)				
40	Any other preliminaries;				
Subtotal above					
Subtotal brought forward from Preliminaries Page BQ - 1					
Subtotal brought forward from Preliminaries Page BQ - 2					
<b>TOTAL FOR BILL 1 - PRELIMINARIES, CARRIED FORWARD TO MAIN SUMMARY PAGE BQ – 83</b>					

ITEM	BILL 2: BLOCK A	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
1.0	<b>RAINWATER DRAINAGE</b>  Supply fix , test and commission the following in UPVC and MUPVC. Soil and waste system to BS4514 with fittings fixed to manufactures printed instructions and BS5572-1978. Tenders must allow in their pipe work and also where stated for pipe fixing clips or holder bolts plugged and screwed. Placed at intervals as per schedule in general mechanical specification.				
1.1	<b>Pipework:-</b>				
1.1.1	UPVC soil pipe 150mm diameter	170LM			
1.2	<b>Extra over tubing for the following:-</b>				
1.2.1	<b>Bends</b>				
1.2.1.1	150mm diameter bend/elbow	6	No.		
1.2.1.2	150mm vertical rainwater outlets	6	No		
1.3	<b>MANHOLES</b>  <b>Provide all materials, and construct manholes not exceeding 2000mm deep comprising the following:-</b>  Concrete class 1:3:6 benching 150mm thick solid block wall Manhole finish 12mm water proofed cement and sand 1:2  <b>MANHOLE COVERS</b> Double sealed Access cover 450 x 600mm comprising: (a) Lower frame (GMS) (b) Cover (GMS) (c) Clamping strips (GMS) (d) Cover damping frame and fixing screws, all stainless steel as WADE specification Code No. R112.	4	No		
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ - 8</b>					

ITEM	BILL 2: BLOCK A	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
2.0	<b>FIRE FIGHTING SYSTEMS</b>				
2.1	<b>HOSE REEL SYSTEM</b> <b>Galvanised Mild Steel (GMS) Class 'C' tubing to B.S. EN10255:2004 and fittings with screwed and socketed joints to BS 21 painted red.</b>				
2.1.1	<b>Pipework:-</b>				
2.1.1.1	25 mm diameter GMS tubing	5	L.M.		
2.1.1.2	50 mm diameter ditto	200	L.M.		
	<b>Extra over tubing for the following:-</b>				
2.1.2	<b>Bends</b>				
2.1.2.1	<b>25mm diameter bend</b>	10	LM		
	50mm Ditto	10	LM		
2.1.2.2	<b>UNION/CAP</b>				
2.1.2.3	50mm diameter union	10	No		
2.1.2.4	50mm diameter cap	2	No		
2.1.3	<b>Tees</b>				
2.1.3.1	50 x 50X50 mm diameter equal tee	4	No.		
2.1.3.2	50 x 25X50 mm diameter ditto	4	No.		
2.1.3.3	Air Vent valve 50mm	2	No		
<b>Sub-Total Carried Forward to Page BQ - 6</b>					

ITEM	BILL 2: BLOCK A	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
2.1.4	<b>Brass work</b>				
2.1.4.1	50mm non return valves	2	No		
2.1.4.2	25 mm diameter gate valve as 'Pegler' or equal and approved.	4	No.		
2.1.4.3	50mm diameter ditto	2	No		
2.1.5	<b>Orifice</b>	4	No		
2.1.6	<b>Hose Reels</b>				
	Automatic, recessed swinging type hosereel with 45 meters long, 25 mm diameter reinforced rubber hose with adjustable nozzle. The hose is manufactured to BS EN 671-1 1995 5274 The hosereel shall be complete with fixing brackets and nozzle cradle. The hosereel should be manufactured to BS EN 694-2001 3169/2 1981 and be able to withstand maximum pressure of up to 15 bars.	4	No.		
<b>Subtotal above</b>					
<b>Subtotal brought forward from Page BQ - 5</b>					
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ - 8</b>					



ITEM	BILL 2: BLOCK A	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
2.0	<b>PORTABLE FIRE EXTINGUISHERS</b>				
2.1	Supply, fix, test and commission of the following:-				
2.1.1	9 Litre polythene lined portable water/CO2 fire extinguisher to B.S 1288 including the appropriate initial charge and mounting brackets.	6	No		
2.1.2	6.0 Kg CO2 gas fire extinguisher to BS 5423 including the appropriate initial charge and mounting brackets.	6	No		
2.1.3	6.0 kg Dry Power fire extinguisher to B.S 3465 and 5423, including the appropriate initial charge and mounting brackets.	6	No		
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ - 8</b>					

ITEM	BILL 2: BLOCK A - COLLECTION PAGE	AMOUNT (KSHS)
1	RAIN WATER DRAINAGE, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 4	
2	FIRE FIGHTING SYSTEMS, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 8	
3	PORTABLE FIRE EXTINGUISHERS, TOTAL BROUGHT FORWARD FROM PAGE NO .BQ-9	
TOTAL FOR BLOCK A CARRIED FORWARD TO MAIN SUMMARY PAGE MS/1 BQ - 83		

ITEM	BILL 2: BLOCK B	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
1.0	<b><u>INTERNAL FOUL DRAINAGE</u></b>  Supply fix , test and commission the following in UPVC and MUPVC. Soil and waste system to BS4514 with fittings fixed to manufactures printed instructions and BS5572-1978. Tenders must allow in their pipe work and also where stated for pipe fixing clips or holder bolts plugged and screwed. Placed at intervals as per schedule in general mechanical specification.				
1.1	<b>FOUL DRAINAGE PIPE WORK</b>				
1.1.1	UPVC soil pipe 150mm diameter	50	LM		
1.1.2	UPVC soil pipe 100mm diameter	250	LM		
1.1.3	UPVC soil pipe 50mm diameter	300	LM		
1.1.4	UPVC soil pipe 32mm diameter	100	LM		
1.2	<b>Extra over tubing for the following Bends / Elbows</b>				
1.2.1	150mm bends long 90 <sup>0</sup>	2	LM		
1.2.2	Long radius bends 100mm diameter	15	No		
1.2.3	Access Bend 100mm diameter 90 <sup>0</sup>	5	No		
1.2.4	Access Bend 50mm diameter 90 <sup>0</sup>	50	No		
1.2.5	Access Bend 32mm diameter 90 <sup>0</sup>	50	No		
<b>Sub-Total Carried Forward to Page BQ - 12</b>					

ITEM	BILL 2: BLOCK B	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
1.3	<b>Extra over tubing for the following Tees</b>				
1.3.1	150 x 100 x 100 x 150 reducing Tee with side inlet	10	No		
1.3.2	50x50x50x50mm tee with side inlet	3	No		
1.3.3	Single branch Tee 100 x 100 x 100mm	36	No		
1.3.4	Ditto but 50 x 50 x 50mm dia.	10	No		
1.3.5	Ditto but 50 x 40 x 50 mm dia	7	No		
1.3.6	Ditto but 50 x 32 x 50 mm dia	50	No		
1.4	75 x 50mm Reducer	10	No		
1.5	Access caps, Plug 100mm diameter	15	No		
1.6	Access caps, Plug 50mm diameter	20	No		
1.7	Vent cowl 100mm	3	No		
1.8	WC connectors 100mm	32	No		
1.9	150 x 75mm Boss Connector	10	No		
1.10	100 x 50 mm diameter Boss Connector	12	No		
1.11	100 x 50 x 40 mm diameter 4-way Light Grey floor trap complete with stainless steel grating and cover.	15	No		
1.12	300x300x200mm deep masonry gulley trap complete with 100mm u-PVC P-trap gully with grating of mild steel	4	No		
<b>Sub-Total Carried Forward to Page BQ - 12</b>					

ITEM	BILL 2: BLOCK B	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
	<p><b>INTERNAL FOUL DRAINAGE (Cont'd')</b></p> <p><b>1.4 MANHOLES</b></p> <p><b>Provide all materials, and construct manholes not less than 450mm deep comprising the following:-</b></p> <p>Concrete class 1:3:6 benching</p> <p>150mm thick solid block wall</p> <p>Manhole finish 12mm water proofed cement and sand 1:2</p> <p><b>MANHOLE COVERS</b></p> <p>Double sealed Access cover 450 x 600mm comprising:</p> <p>(a) Lower frame (GMS)</p> <p>(b) Cover (GMS)</p> <p>(c) Clamping strips (GMS)</p> <p>(d) Cover damping frame and fixing screws, all stainless steel as WADE specification Code No. R112.</p> <p><b>1.5 TESTING</b></p> <p>Allow for water test and air test for the whole of internal drainage system as described to the satisfaction of the 1 Item Engineer.</p> <p><b>1.6 EXCAVATION</b></p> <p>Excavate trench for drainage pipes not exceeding 1000mm but average 600mm deep and return soil and cart away, balance. 70 LM Allow for pipe bedding material</p>	7	No		
<b>Sub-Total Carried Forward to Page BQ - 12</b>					

ITEM	BILL 2: BLOCK B - COLLECTION PAGE	AMOUNT (KSHS)
	<p><b>INTERNAL FOUL DRAINAGE</b></p> <p><b>Subtotal brought forward from Page BQ - 9</b></p> <p><b>Subtotal brought forward from Page BQ - 10</b></p> <p><b>Subtotal brought forward from Page BQ - 11</b></p>	
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ-27</b>		

ITEM	BILL 2: BLOCK B	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
2.0	<b><u>RAINWATER DRAINAGE</u></b>  Supply fix , test and commission the following in UPVC and MUPVC. Soil and waste system to BS4514 with fittings fixed to manufactures printed instructions and BS5572-1978. Tenders must allow in their pipe work and also where stated for pipe fixing clips or holder bolts plugged and screwed. Placed at intervals as per schedule in general mechanical specification.				
2.1	<b>Pipework:-</b>				
2.1.1	UPVC soil pipe 100mm diameter class D	140	LM		
2.1.2	Ditto but 150 mm	140	LM		
2.2	<b>Extra over tubing for the following:-</b>				
2.2.1	<b>Bends</b>				
2.2.1.1	100mm diameter bend/elbow	8	No.		
	<b>RAIN WATER OUTLETS</b>				
2.2.1.2	100mm Vertical Rainwater Outlet	8	No.		
2.3	<b>MANHOLES</b>  <b>Provide all materials, and construct manholes not less than 400mm and not exceeding 2000mm deep comprising the following:-</b>  Concrete class 1:3:6 benching 150mm thick solid block wall Manhole finish 12mm water proofed cement and Sand 1:2  <b>MANHOLE COVERS</b> Double sealed Access cover 450 x 600mm comprising: (a) Lower frame (GMS) (b) Cover (GMS) (c) Clamping strips (GMS)  (d) Cover damping frame and fixing screws, all stainless steel as WADE specification Code No. R112.	8	No		
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ-27</b>					

ITEM	BILL 2: BLOCK B	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
3.0	<b>INTERNAL PLUMBING</b>				
	<b>Supply, fix, test and commission the followings:-</b>				
	<b>CPVC Tubing and fittings with socketed joints including fixing and jointing as described , and following scheme drawings, or an approved equivalent material.</b>				
3.1	<b>PIPE WORK</b>				
3.1.1	15mm diameter CPVC tubing	80	LM		-
3.1.2	Ditto but 20mm diameter	40	LM		
3.1.3	25mm diameter ditto	40	LM		-
3.1.4	32mm diameter ditto	120	LM		-
3.1.5	50mm diameter ditto	600	LM		-
3.1.6	65mm diameter ditto	36	LM		-
3.1.7	80mm diameter ditto	30	LM		-
3.2	<b>Extra over tubing for the following Bends/Elbows</b>				
3.2.1	Bend/ elbow 15mm diameter	120	No		-
3.2.2	Ditto but for 20mm diameter	50	No		
3.2.3	Ditto but for 25mm diameter	30	No		-
3.2.4	Ditto but for 32mm diameter	50	No		-
3.2.5	Ditto but for 50mm diameter	60	No		-
3.2.6	Ditto but for 65mm diameter	10	No		
3.2.7	Ditto but for 80mm diameter	20	No		-
3.2.8	Elbow With brass threads 15mm diameter	44	No.		-
<b>Sub-Total Carried Forward to Page BQ - 17</b>					



ITEM	BILL 2: BLOCK B	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
3.3	<b>Extra over for Tees</b>				
3.3.1	20 x 20 x 20mm diameter equal tee	10	No		-
3.3.2	25 x 20 x 25mm diameter tee	10	No		-
3.3.3	25 x 15 x 25mm diameter tee	10	No		-
3.3.4	32 x 15 x 32mm diameter equal	65	No		-
3.3.5	50 x 32 x 50mm diameter tee	40	No		-
3.3.6	65 x 50 x 65mm diameter tee	40	No		-
3.3.7	80 x 65 x 80mm diameter tee	40	No		-
3.4	<b>REDUCERS</b>				
3.4.1	25 x 20mm diameter Ditto	10	No		
3.4.2	32 x 15mm diameter ditto	12	No		
3.4.3	40 x 32 mm diameter ditto	10	No		
3.4.4	50 x 40mm diameter ditto	10	No		
3.4.5	40 x 25mm diameter ditto	100	No		
3.4.6	50 x 25mm diameter ditto	10	No		
<b>Sub-Total Carried Forward to Page BQ - 17</b>					

ITEM	BILL 2: BLOCK B	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
<b>3.5</b>	<b>UNIONS</b>				
3.5.1	20mm diameter Union	10	No		
3.5.2	Ditto but 25mm	10	No		
3.5.3	Ditto but 32mm	10	No		
3.5.4	Ditto but 40mm	10	No		
3.5.5	Ditto but 50mm	10	No		
3.5.6	Ditto but 65mm	8	No		
3.5.7	Ditto but 80mm	8	No		
<b>3.6</b>	<b>BRASS WORK</b>				
3.6.1	15mm diameter high pressure screw-down full-way non-rising stem angle valve as Peglar.	36	No		
3.6.2	Ditto but 25mm diameter	8	No		
3.6.3	Ditto but 32mm diameter	15	No		
3.6.4	Ditto but 50mm diameter	30	No		
3.6.5	Ditto but 65mm diameter	8	No		
3.6.6	Ditto but 80mm diameter	4	No		
3.6.7	Ball valve 50mm	2	No		
<b>Sub-Total Carried Forward to Page BQ - 17</b>					

ITEM	BILL 2: BLOCK B	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
3.7	<b>STERILIZATION</b> Allow for sterilization of the whole of the internal plumbing works by 70% chlorine as described to the satisfaction of the 1 Item Engineer.				
3.8	<b>PIPE SUPPORT FOR PIPES BELOW 100MM DIAMETER</b> The pipe of diameter below 100mm shall be supported using supports as HILTI MPN-SI pipe ring, standard duty, 200 No galvanised with double connection boss thread M8/M10.				
<b>Subtotal above</b>  <b>Subtotal brought forward from Page BQ - 14</b>  <b>Subtotal brought forward from Page BQ - 15</b>  <b>Subtotal brought forward from Page BQ - 16</b>					
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ-27</b>					

ITEM	BILL 2: BLOCK B	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
<b>4.0</b>	<b>TANKS AND PUMPS</b>				
<b>4.1</b>	<b>Supply, install, test and commission the following:-</b>				
	Pressed steel water storage tanks consisting of mass produced pressed steel panels bolted together in 1000mm square modules, hydraulically cold pressed in one piece and embossed with a distinctive star pressing at the centre to strengthen the panels. The tanks shall be 3000 x 2000 x 2000mm, high all to BS 4360 Grade 43A, painted with 2 coats of aluminium paint as made by Steel Structures or equivalent. The tank to be complete with the following:-	2	No		
4.1.1	40mmØ inlet pipe connection				
4.1.2	75mmØ outlet pipe connectors				
4.1.3	75mmØ tank drain pipe connection				
4.1.4	75mm Ø overflow pipe connection				
4.1.5	75mm diameter plastic-metal coupling				
4.1.6	Manhole and cover with mosquito proof mesh				
4.1.7	40mm Ø ball valve				
<b>4.2</b>	<b>LADDER</b>				
4.1.1	Tanks external ladder	2	No		
4.1.2	Tank internal ladder	2	No		
4.1.3	Tank level indicator	2	No		
4.1.4	Painting of the ladders with primer and final coat same as the tanks.	2	No		
<b>4.3</b>	<b>PUMPS</b>				
	Pressure boosting pump as Grundfos Scalar 2 - 50% (electronic Pressure set) with integrated speed controller, pressure tank, sensors and non-return valve incorporated in the compact housing. The pump shall be of duty 0.8cubic m at 10m head	2	No		
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ-27</b>					

ITEM	BILL 2: BLOCK B	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
<b>5.0</b>	<b>SANITARY FITTINGS</b>				
5.1	Water closet as Twyford's e100 standard round Vitreous China, white to B.S. 3402 comprising the following:-				
5.1.1	WC bowl horizontal outlet 11068. Close coupled round cistern & fitting 6/4L BSIO, push button				
5.1.2	Seat and cover with soft closing mechanism and metal hinges or equal and approved	4	No.		
5.1.3	Seat and cover with soft closing mechanism and stainless steel hinges or equal and approved	32	No.		
5.1.4	Water close flushometer foralcona BTW bowl, as Sloan systems model 150-1.6, with lower water consumption of approximately 6 litres per flush, as manufactured by Sloan company or equal and approved.	32	No		
5.1.5	Sloan Optima Electronic hand washing faucet sensor operated, model ETF -600C (8.4 lpm max) laminar flow spray head, 240 VAC /24 VAC 50/60 Hz (50 VA), or equal and approved.	40	No		
5.1.6	Wash Hand Basin as Twyford entice 570 countertop Vitreous China, white to B.S. 3402 with 1 centre hole, complete with 75 mm chrome plated bottle p-trap chrome plated waste and extension pipe with wall flange chrome plated.	36	No		
5.1.7	Urinal as Twyford Spectrum Comprising urinal bowl complete with fixing kit and outlet connector for one person, white to BS 3402.	12	No		
5.1.8	Sensor operated Urinal Flushometer as Sloan Optima model 195.0.5 WB ES.S complete with electrical accessories.	12	No		
5.1.9	Surface Mounted Automatic Hand Dryer as Bobrick model B-748, Chrome plated cover single phase motor, as described in Part C.	11	No		
<b>Sub-Total Carried Forward to Page BQ - 20</b>					

ITEM	BILL 2: BLOCK B	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
5.2.4	Hinged support rail for use in disabled toilet facilities as Twyford's Part No. 58441 PCO.	4	No		
5.2.5	Back support with cushions for use in disabled water closets as Twyford's Part No. 58442 PCO.	4	No		
5.2.6	Spacer box to extend WC from wall to dimensions required under Building Regulations 1985 Appv. Doc. M or Dept. of Health Doc. HTM 64 as Twyford's Part No. 58446XXO, to suit Olympian WH WC bowl.	4	No		
5.3	<b>CLEANER'S SINK</b> Cleaner's sink as Twyford highback sink with high splash back, easy clean stain resistant glazed surface and stainless steel hinged bucket grating complete with 75 mm chrome plated bottle p-trap chrome plated waste and extension pipe with wall flange chrome plated and tap, or approved equivalent.	3	No		
5.4	<b><u>WASHROOM ACCESSORIES</u></b>				
5.4.1	Single Jumbo Roll Tissue Dispenser	8	No		
5.4.2	Recessed Toilet Tissue Dispenser	4	No		
5.4.3	Sanitary Napkin Disposal	8	No		
5.4.4	Waste Bin	12	No		
5.5	Coat Hook with Bumper	28	No.		
5.6	Surface mounted Door Bumper	28	No		
5.7	Soap Dispenser	12	No		
<b>Subtotal above</b>					
<b>Subtotal brought forward from Page BQ - 19</b>					
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ - 27</b>					

ITEM	BILL 2: BLOCK B	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
6.0	<b>FIRE FIGHTING SYSTEMS</b>				
6.1	<b>HOSE REEL SYSTEM</b>				
	<b>Galvanised Mild Steel (GMS) Class 'C' tubing to B.S. EN10255:2004 and fittings with screwed and socketed joints to BS 21</b>				
6.1.1	<b>Pipework:-</b>				
6.1.1.1	25 mm diameter GMS tubing	8	L.M.		
6.1.1.2	50 mm diameter ditto	200	L.M.		
	<b>Extra over tubing for the following:-</b>				
6.1.2	<b>Bends</b>				
6.1.2.1	25 mm diameter bend	16	No.		
6.1.2.2	50mm diameter ditto	20	No		
6.1.2.3	50mm diameter union	15	No		
6.1.2.4	50mm diameter cap	2	No		
6.1.3	<b>Tees</b>				
6.1.3.1	50 x 50X50 mm diameter equal tee	10	No.		
6.1.3.2	50 x 25X50 mm diameter ditto	8	No.		
6.1.3.3	Air Vent valve 50mm	4	No		
6.1.4	<b>Brass work</b>				
6.1.4.1	50mm high pressure non return valves	2	No		
6.1.4.2	25 mm diameter high pressure gate valve as 'Pegler' or equal and approved.	8	No.		
6.1.4.3	50mm diameter ditto	8	No.		
<b>Sub-Total Carried Forward to Page BQ - 27</b>					

ITEM	BILL 2: BLOCK B	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
6.1.7	<p>Automatic, recessed swinging type hosereel with 45 meters long, 25 mm diameter reinforced rubber hose with adjustable nozzle. The hose is manufactured to BS EN 671-1 1995 5274 The hosereel shall be complete with fixing brackets and nozzle cradle. The hosereel should be manufactured to BS EN 694-2001 3169/2 1981 and be able to withstand maximum pressure of up to 15 bars.</p> <p><b>Hose reel pumps</b></p> <p>Hose reel pumps as Dayliff Pressure set complete with Dailiff DB 12 - 50 horizontal multistage centrifugal pump, ONE DUTY THE OTHER STANDBY complete with a 2.82kW 3 ph 2900rpm squirrel cage motor, 1 No GWS60 pressure vessel, I no pressure gauge, I No pressure switch all mounted on a steel base with terminal set for variable speed operation. 2 No The pressure set will be complete with the inlet and outlet manifold terminating with a valve, all frame mounted and pre-wired. Each pump is capable of delivering up to 7m3/hr at 45m or equal and approved. The pump shall be complete with control panel and BMS compatible.</p>	8	No.		
Sub-Total Carried Forward to Page BQ - 27					



ITEM	BILL 2: BLOCK B - COLLECTION PAGE	AMOUNT (KSHS)
	<p>The control panel is to be located in the position indicated on the contract drawings.</p> <p>The control panel shall be constructed of mild steel, be moisture ,insect and rodent proof and shall be provided complete with spare fuses and wiring diagram enclosed in plastic laminate.</p> <p>The pump shall be controlled by a flow switch therefore the control panel shall include the following:</p> <p>On push button for setting control panels</p> <p>Green indicator light for indicating control panel live.</p> <p>Duty/standby, auto changeover</p> <p>Duty pump, run green indicator light</p> <p>Standby pump, run green indicator light.</p> <p>Duty pump fail red indicator light</p> <p>Standby pump, fail red indicator light.</p> <p>Low water condition pump cut-out with red indicator light.</p> <p>The pumps are to be protected by a low level cut-out switch to prevent dry pump run when low-level water conditions occur.</p>	
<b>Sub-Total Carried Forward to Page BQ - 26</b>		

ITEM	BILL 2: BLOCK B	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
7.0	<b>PORTABLE FIRE EXTINGUISHERS</b>				
7.1	Supply, fix, test and commission of the following:-				
7.1.1	9 Litre polythene lined portable water/CO2 fire extinguisher to B.S 1288 including the appropriate initial charge and mounting brackets.	8	No		
7.1.2	6.0 kg Dry Power fire extinguisher to B.S 3465 and 5423, including the appropriate initial charge and mounting brackets.	8	No		
<b>Sub-Total Carried Forward to Page BQ - 26</b>					

ITEM	BILL 2: BLOCK B	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
8.0	<b>DRY RISER INSTALLATION</b>  Galvanised mild steel (GMS) Class 'D' tubing to B.S. EN10255:2004 and fittings with screwed and socketed joints to B.S. 21 including fixing and jointing as described.				
8.1	<b>Piping</b>  100 mm diameter tubing	120	LM		
8.2	<b>Extra over tubing for the following:-</b>				
8.2.1	<b>Bend</b>  100 mm diameter flanged bends	6	No.		
8.2.2	<b>Equal Tees</b>				
8.2.2.1	100 x 100 x 100mm diameter Equal Tee	10	No.		
8.2.2.2	100 x 100 flanges (welded joints)	8	No		
8.2.2.3	100 x 65mm reducer	8	No		
8.2.3	<b>Valves</b>				
8.2.3.1	Non return valves 100mm	2	No		
8.2.3.2	Air release valve as Glenfield No 1260 'Apex' or equal and approved	2	No.		
8.3	Landing valve as Merry-Weather 'equerry' constant pressure outlet with flanged inlet and 1 no. 65mm female instantaneous outlet with a blank cap and chain as described.	8	No		
8.4	<b>Breeching Inlet</b>  Twin 65 mm diameter Fire Bridge breeching inlet with flanged connections and female quick coupling to B.S. 5041 and painted red.	2	No		
<b>Sub-Total Carried Forward to Page BQ - 26</b>					

ITEM	BILL 2: BLOCK B	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
8.5	<b>Canvas Hose</b>  65 mm diameter 30 m long canvas hose designed to bust at a pressure of 34 bars. The hose shall have attached an instantaneous hose coupling branch pipe and nozzle to B.S. 336:1965.	8	No.		
8.6	<b>Hose Cradle</b>  High quality fitting Hose Cradle designed for use in public buildings. The Cradle shall be made in aluminum throughout and shall be supplied with wall bracket and the finish shall be or chrome plated.	8	No polished		
8.7	<b>Testing and Commissioning</b>  Allow for testing and commissioning of the whole of wet riser system to the satisfaction of the Engineer.	1	Item		
8.8	<b>Painting</b>  Allow for painting of the pipes with 2 coats of red paint.	48	L.M.		
<p style="text-align: center;"><b>Subtotal above</b></p> <p style="text-align: center;"><b>Subtotal brought forward from Page BQ - 22</b></p> <p style="text-align: center;"><b>Subtotal brought forward from Page BQ - 23</b></p> <p style="text-align: center;"><b>Subtotal brought forward from Page BQ - 24</b></p> <p style="text-align: center;"><b>Subtotal brought forward from Page BQ - 25</b></p> <p style="text-align: center;"><b>Subtotal brought forward from Page BQ - 26</b></p>					
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO.</b>					

BQ-27

ITEM	BILL 2: BLOCK B - COLLECTION PAGE	AMOUNT (KSHS)
1	INTERNAL FOUL DRAINAGE TOTAL BROUGHT FORWARD FROM PAGE NO. BQ-12	
2	RAIN WATER DRAINAGE TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 13	
3	INTERNAL PLUMBING TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 17	
4	TANKS AND PUMPS TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 18	
5	SANITARY FITTINGS TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 20	
6	FIRE FIGHTING SYSTEMS TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 26	
TOTAL FOR BLOCK B CARRIED FORWARD TO MAIN SUMMARY PAGE MS/1 BQ - 83		

ITEM	BILL 2: BLOCK C	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
1.0	<b>INTERNAL FOUL DRAINAGE</b>  Supply fix , test and commission the following in UPVC and MUPVC. Soil and waste system to BS4514 with fittings fixed to manufactures printed instructions and BS5572-1978. Tenders must allow in their pipe work and also where stated for pipe fixing clips or holder bolts plugged and screwed. Placed at intervals as per schedule in general mechanical specification.				
1.1	<b>FOUL DRAINAGE PIPE WORK</b>				
1.1.1	UPVC soil pipe 150mm diameter	116	LM		
1.1.2	UPVC soil pipe 100mm diameter	250	LM		
1.1.3	UPVC soil pipe 50mm diameter	300	LM		
1.1.4	UPVC soil pipe 32mm diameter	100	LM		
1.2	<b>Extra over tubing for the following Bends / Elbows</b>				
1.2.1	150mm long radius bends 90 <sup>0</sup>	2	LM		
1.2.2	Long radius bends 100mm diameter	15	No		
1.2.3	Access Bend 100mm diameter 90 <sup>0</sup>	5	No		
1.2.4	Access Bend 50mm diameter 90 <sup>0</sup>	50	No		
1.2.5	Access Bend 32mm diameter 90 <sup>0</sup>	50	No		
<b>Sub-Total Carried Forward to Page BQ - 31</b>					

ITEM	BILL 2: BLOCK C	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
1.3.2	50x50x50x50mm tee with side inlet	3	No		
1.3.3	Single branch Tee 100 x 100 x 100mm	36	No		
1.3.4	Ditto but 50 x 50 x 50mm dia.	10	No		
1.3.5	Ditto but 50 x 40 x 50 mm dia	7	No		
1.3.6	Ditto but 50 x 32 x 50 mm dia	50	No		
1.4	Access caps, Plug 100mm diameter	10	No		
1.5	Access caps, Plug 50mm diameter	15	No		
1.6	Vent cowl 100mm	20	No		
1.7	WC connectors 100mm	3	No		
1.8	100mm diameter air admittance valves	32	No		
1.9	100 x 50 mm diameter Boss Connector	10	No		
1.10	150x75mm boss connector	12	No		
1.11	100 x 50 x 40 mm diameter 4-way Light Grey floor trap complete with stainless steel grating and cover.	16	No		
1.12	300x300x200mm or more deep masonry gulley trap complete with 100mm u-PVC P-trap gully with grating of mild steel	6	No		
Sub-Total Carried Forward to Page BQ - 31					

ITEM	BILL 2: BLOCK C	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
1.4	<p><b>MANHOLES</b></p> <p><b>Provide all materials, and construct manholes not exceeding 2000mm deep and not less than 450mm deep comprising the following:-</b></p> <p>Concrete class 1:3:6 benching</p> <p>150mm thick solid block wall</p> <p>Manhole finish 12mm water proofed cement and Sand 1:2</p> <p><b>MANHOLE COVERS</b></p> <p>Double sealed Access cover 450 x 600mm comprising:</p> <p>(a) Lower frame (GMS)</p> <p>(b) Cover (GMS)</p> <p>(c) Clamping strips (GMS)</p> <p>(d) Cover damping frame and fixing screws, all stainless steel as WADE specification Code No. R112.</p>	9	No		
1.5	<p><b>TESTING</b></p> <p>Allow for water test and air test for the whole of internal drainage system as described to the satisfaction of the 1 Item Engineer.</p>				
1.6	<p><b>EXCAVATION</b></p> <p>Excavate trench for drainage pipes not exceeding 1000mm but average 600mm deep and return soil and cart away, balance. 100 LM Allow for pipe bedding material</p>				
<b>Sub-Total Carried Forward to Page BQ - 31</b>					



ITEM	BILL 2: BLOCK C	AMOUNT (KSHS)
	<p><b>INTERNAL FOUL DRAINAGE</b></p> <p>1 TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 28</p> <p>2 TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 29</p> <p>3 TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 30</p>	
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ - 47</b>		

ITEM	BILL 2: BLOCK C	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
2.0	<p><b><u>RAINWATER DRAINAGE</u></b></p> <p>Supply fix , test and commission the following in UPVC and MUPVC. Soil and waste system to BS4514 with fittings fixed to manufactures printed instructions and BS5572-1978. Tenders must allow in their pipe work and also where stated for pipe fixing clips or holder bolts plugged and screwed. Placed at intervals as per schedule in general mechanical specification.</p> <p><b>2.1 Pipework:-</b></p> <p>2.1.1 UPVC soil pipe 100mm diameter</p> <p>2.1.2 Ditto but 150 mm</p> <p><b>2.2 Extra over tubing for the following:-</b></p> <p><b>2.2.1 Bend/Tees</b></p> <p>2.2.1.1 100mm diameter bend/elbow</p> <p>2.2.1.2 100mm vertical rainwater outlets</p> <p><b>2.3 MANHOLES</b></p> <p><b>Provide all materials, and construct manholes not exceeding 2000mm and not less than 400mm deep deep comprising the following:-</b></p> <p>Concrete class 1:3:6 benching</p> <p>150mm thick solid block wall</p> <p>Manhole finish 12mm water proofed cement and Sand 1:2</p> <p><b>MANHOLE COVERS</b></p> <p>Double sealed Access cover 450 x 600mm comprising:</p> <p>(a) Lower frame (GMS)</p> <p>(b) Cover (GMS)</p> <p>(c) Clamping strips (GMS)</p> <p>(d) Cover damping frame and fixing screws, all stainless steel as WADE specification Code No. R112.</p>	140	LM		
		140	LM		
		6	No.		
		6	No		
		8	No		
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ - 47</b>					

ITEM	BILL 2: BLOCK C	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
3.0	<b>INTERNAL PLUMBING</b> <b>Supply, fix, test and commission the followings:-</b>  <b>CPVC Tubing and fittings with socketed joints including fixing and jointing as described , and following scheme drawings, or an approved equivalent material.</b>				
3.1	<b>PIPE WORK</b>				
	15mm diameter CPVC tubing	80	LM		
3.1.1	20mm diameter CPVC tubing	40	LM		
3.1.2	25mm diameter ditto	40	LM		
3.1.3	32mm diameter ditto	120	LM		
3.1.4	50mm diameter ditto	100	LM		
3.1.5	65mm diameter ditto	36	LM		
3.1.6	80mm diameter ditto	30	LM		
3.2	<b>Extra over tubing for the following Bends/Elbows</b>				
3.2.1	Ditto but for 20mm diameter	100	No		
3.2.2	Ditto but for 25mm diameter	20	No		
3.2.3	Ditto but for 32mm diameter	50	No		
3.2.4	Ditto but for 50mm diameter	40	No		
	Ditto 65mm diameter	10	No		
3.2.5	Ditto but for 80mm diameter	10	No		
3.2.6	15mm diameter elbow with brass threads	44	No		
3.3	<b>Extra over for Tees</b>				
3.3.1	20 x 20 x 20mm diameter equal tee	10	No		
3.3.2	25 x 20 x 25mm diameter tee	10	No		
3.3.3	25 x 15 x 25mm diameter tee	10	No		
3.3.4	32 x 15 x 32mm diameter equal	65	No		
3.3.5	50 x 32 x 50mm diameter tee	40	No		
3.3.6	80 x 50 x 80mm diameter tee	40	No		
3.3.7	80X 65 X 80mm diameter tee	40	No		
<b>Sub-Total Carried Forward to Page BQ - 37</b>					

ITEM	BILL 2: BLOCK C	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
3.4	<b>REDUCERS</b>				
3.4.1	25 x 20mm diameter Ditto	10	No		
3.4.2	32 x 25mm diameter ditto	12	No		
3.4.3	40 x 32 mm diameter ditto	10	No		
3.4.4	50 x 40mm diameter ditto	10	No		
3.4.5	40 x 25mm diameter ditto	10	No		
3.4.6	50 x 25mm diameter ditto	10	No		
3.5	<b>UNIONS</b>				
3.5.1	20mm diameter Union	4	No		
3.5.2	Ditto but 25mm	10	No		
3.5.3	Ditto but 32mm	5	No		
3.5.4	Ditto but 40mm	4	No		
3.5.5	Ditto but 50mm	10	No		
3.5.6	Ditto but 65mm	8	No		
3.5.7	Ditto butt 80mm	8	No		
<b>Sub-Total Carried Forward to Page BQ - 37</b>					

ITEM	BILL 2: BLOCK C	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
3.6	<b>BRASS WORK</b>				
3.6.1	15mm diameter high pressure screw-down full-way non-rising stem gate valve as Peglar.	36	No		
3.6.2	Ditto but 25mm diameter	8	No		
3.6.3	Ditto but 32mm diameter	15	No		
3.6.4	Ditto but 50mm diameter	30	No		
3.6.5	Ditto but 80mm diameter	4	No		
3.6.6	Ball valve 65mm	2	No		
3.7	<b>STERILIZATION</b>				
	Allow for sterilization of the whole of the internal plumbing works by 70% chlorine as described to the satisfaction of the 1 Item Engineer.				
3.8	<b>PIPE SUPPORT FOR PIPES BELOW 100MM DIAMETER</b>				
	The pipe of diameter below 100mm shall be supported using supports as HILTI MPN-SI pipe ring, standard duty, 200 No galvanised with double connection boss thread M8/M10.				
<b>Sub-Total Carried Forward to Page BQ - 36</b>					

ITEM	BILL 2: BLOCK C				AMOUNT (KSHS)
1	INTERNAL PLUMBING				
2	TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 33				
3	TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 34				
3	TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 35				
TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ - 47					

ITEM	BILL 2: BLOCK C	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
4.0	<b>TANKS AND PUMPS</b>				
4.1	<b>Supply, install, test and commission the following:-</b>  Pressed steel water storage tanks consisting of mass produced pressed steel panels bolted together in 1000mm square modules, hydraulically cold pressed in one piece and embossed with a distinctive star pressing at the centre to strengthen the panels. The tanks shall be 3000 x 2000 x 2000mm, high all to BS 4360 Grade 43A, painted with 2 coats of aluminium paint as made by Steel Structures or equivalent. The tank to be complete with the following:-  40mmØ inlet pipe connection 75mmØ outlet pipe connectors 75mmØ tank drain pipe connection 75mm Ø overflow pipe connection Manhole and cover with mosquito proof mesh 75mm diameter plastic-metal coupling 40mm Ø ball valve	2	No		
4.2	<b>LADDER</b>				
	Tanks external ladder	2	No		
	Tank internal ladder	2	No		
	Tank level indicator	2	No		
	Painting of the ladders with primer and final coat same as the tanks.	2	No		
4.3	<b>Pumps</b>				
	Pressure boosting pump as Grundfos Scalar 2 - 50% (electronic Pressure set) with intergrated speed controller, pressure tank, sensors and non return valve incorporated in the compact housing.	2	No		
4.4	<b>CONTROL PANELS</b>				
	Pumps operation is controlled by Control MPC with the following functions:-  Intelligent multi-pump controller, CU 351 PID controller with adjustable PI parameters (KP +Ti) Constant pressure at setpoint, independent of inlet pressure. On/off operation at low flow Automatic cascade control of pumps for optimum efficiency Selection of min. time between start/stop, automatic pump changeover and pump priority.	1	No		
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ - 47</b>					

ITEM	BILL 2: BLOCK C	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
	<p>more Motor Control Panel functions:</p> <ul style="list-style-type: none"> <li>Automatic pump test function to prevent idle pumps from seizing up.</li> <li>Possibility of standby pump allocation</li> <li>Possibility of backup sensor (redundant primary sensor).</li> <li>Manual operation</li> <li>Possibility of external setpoint influence.</li> <li>Possibility of digital remote-control functions:-</li> <li>System on/off</li> <li>up to 6 alternative setpoints</li> <li>Digital inputs and outputs can be configured individually.</li> </ul> <p>Pumps and system monitoring functions:-</p> <ul style="list-style-type: none"> <li>minimum and maximum limits of current value</li> <li>inlet pressure</li> </ul> <p>Motor protection</p> <ul style="list-style-type: none"> <li>Sensors and cables monitored against malfunction</li> <li>Alarm log with the previous 24 warnings/alarms</li> </ul> <p>Display and indication functions</p> <ul style="list-style-type: none"> <li>320 x240 pixels graphical display with backlight</li> <li>green indicator light for operating indications and red indicator light for fault indications.</li> <li>potential-free changeover contacts for operation and fault.</li> </ul> <p>Grundfos bus communication</p>				
<b>Sub-Total Carried Forward to Page BQ - 41</b>					



ITEM	BILL 2: BLOCK C	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
5.0	<b>SANITARY FITTINGS</b>				
5.1	<b>Supply, install test and commission the following sanitary fitting below:-</b>				
5.1.1	Water closet as Twyford's e100 standard round Vitreous China, white to B.S. 3402 comprising the following:-  WC bowl horizontal outlet 11068. Close coupled round cistern & fitting 6/4L BSIO, push button Seat and cover with soft closing mechanism and metal hinges or equal and approved	4	No.		
5.1.2	Water closet as Twyfordalcona BTWV Vitreous China, white to B.S. 3402 comprising the following:- Seat and cover with soft closing mechanism and stainless steel hinges or equal and approved	32	No.		
5.1.3	Water close flushometer for Olympia BTW bowl, as Sloan systems model 150-1.6, with lower water consumption of approximately 6 litres per flush, as manufactured by Sloan company or equal and approved.	32	No		
5.1.4	Sloan Optima Electronic hand washing faucet sensor operated, model ETF -600C (8.4 lpm max) laminar flow spray head, 240 VAC /24 VAC 50/60 Hz (50 VA), or equal and approved.	40	No		
5.1.5	Wash Hand Basin as Twyford entice 570 countertop Vitreous China, white to B.S. 3402 with 1 centre hole, complete with 75 mm chrome plated bottle p-trap chrome plated waste and extension pipe with wall flange chrome plated.	36	No		
5.1.6	Urinal as Twyford Spectrum Comprising urinal bowl complete with fixing kit and outlet connector for one person, white to BS 3402.	12	No		
5.1.7	Sensor operated Urinal Flushometer as Sloan Optima model 195.0.5 WB ES.S complete with electrical accessories.	12	No		
<b>Sub-Total Carried Forward to Page BQ - 41</b>					

ITEM	BILL 2: BLOCK C	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
5.1.8	Surface Mounted Automatic Hand Dryer as Bobrick model B-748, Chrome plated cover single phase motor, as described in Part C.	12	No		
5.2	<b>DISABLED WASHROOM</b>				
5.2.1	Cleaner's sink as Twyford highback sink with high splash back, easy clean stain resistsntt glazed surface and stailless steel hinged bucket grating complete with 75 mm chrome plated bottle p-trap chrome plated waste and extension pipe with wall flange chrome plated and tap, or approved equivalent.	4	No.		
5.2.2	Grab support rail to assist disabled as Twyfords Part No. 58432 PCO.	4	No		
5.2.3	Combined toilet roll holder and grab rail to assist disabled, as Twyfords Part No. 58438 PCO.	4	No		
5.2.4	Hinged support rail for use in disabled toilet facilities as Twyfords Part No. 58441 PCO.	4	No		
5.2.5	Back support with cushions for use in disabled water closets as Twyfords Part No. 58442 PCO.	4	No		
5.2.6	Spacer box to extend WC from wall to dimensions required under Building Regulations 1985 Appv. Doc. M or Dept. of Health Doc. HTM 64 as Twyfords Part No. 58446XXO, to suit Olympian WH WC bowl.	4	No		
	Cleaner's sink as Twyford highback sink with high splash back, easy clean stain resistsntt glazed surface and stailless steel hinged bucket grating complete with 75 mm chrome plated bottle p-trap chrome plated waste and extension pipe with wall flange chrome plated and tap	3	No		
5.4	<b>WASHROOM ACCESSORIES</b>				
5.4.1	Single Jumbo Roll Tissue Dispenser	8	No		
5.4.2	Recessed Toilet Tissue Dispenser	4	No		
5.4.3	Sanitary Napkin Disposal	8	No		
5.4.4	Waste Bin	12	No		
<b>Sub-Total Carried Forward to Page BQ - 41</b>					

ITEM	BILL 2: BLOCK C	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
5.4.1	600 x 800mm	4	No		
5.4.2	2400 x 800mm	8	No		
5.5	Coat Hook with Bumper	28	No.		
5.6	Surface mounted Door Bumper	28	No		
5.7	Soap Dispenser	12	No		
5.7	Workshop Sink coplete with bottle trap and bib tap	2	No		
<p style="text-align: center;"><b>Subtotal above</b></p> <p style="text-align: center;"><b>Subtotal brought forward from Page BQ - 38</b></p> <p style="text-align: center;"><b>Subtotal brought forward from Page BQ - 39</b></p> <p style="text-align: center;"><b>Subtotal brought forward from Page BQ - 40</b></p>					
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ - 47</b>					

ITEM	BILL 2: BLOCK C	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
6.0	<b>FIRE FIGHTING SYSTEMS</b>				
6.1	<b>HOSE REEL SYSTEM</b>				
	<b>Galvanised Mild Steel (GMS) Class 'C' tubing to B.S. EN10255:2004 and fittings with screwed and socketed joints to BS 21</b>				
6.1.1	<b>Pipework:-</b>				
6.1.1.1	25 mm diameter GMS tubing	8	L.M.		
6.1.1.2	50 mm diameter ditto	200	L.M.		
	<b>Extra over tubing for the following:-</b>				
6.1.2	<b>Bends</b>				
6.1.2.1	25 mm diameter bend	16	No.		
6.1.2.2	50mm diameter ditto	10	No		
6.1.2.3	50mm diameter union	15	No		
6.1.2.4	50mm diameter cap	2	No		
6.1.3	<b>Tees</b>				
6.1.3.1	50 x 50 mm diameter equal tee	8	No.		
6.1.3.2	50 x 25 mm diameter ditto	8	No.		
6.1.3.3	Air Vent valve	4	No		
6.1.4	<b>Brass work</b>				
6.1.4.1	50mm non return valves	2	No		
6.1.4.2	25 mm diameter high pressure gate valve as 'Pegler' or equal and approved.	8	No.		
6.1.4.3	50mm diameter ditto	8	No		
<b>Sub-Total Carried Forward to Page BQ - 43</b>					

ITEM	BILL 2: BLOCK C	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
6.1.5	Orifice	8	No		-
6.1.6	<b>Hose Reels</b>  Automatic, recessed swinging type hosereel with 45 meters long, 25 mm diameter reinforced rubber hose with adjustable nozzle. The hose is manufactured to BS EN 671-1 1995 5274 The hosereel shall be complete with fixing brackets and nozzle cradle. The hosereel should be manufactured to BS EN 694-2001 3169/2 1981 and be able to withstand maximum pressure of up to 15 bars.	8	No.		
Subtotal above					
Subtotal brought forward from Page BQ - 42					
TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ - 47					

ITEM	BILL 2: BLOCK C	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
7.0	<b>PORTABLE FIRE EXTINGUISHERS</b>				
7.1	Supply, fix, test and commission of the following:-				
7.1.1	9 Litre polythene lined portable water/CO2 fire extinguisher to B.S 1288 including the appropriate initial charge and mounting brackets.	8	No		
7.1.2	6.0 kg Dry Power fire extinguisher to B.S 3465 and 5423, including the appropriate initial charge and mounting brackets.	8	No		
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ - 47</b>					

ITEM	BILL 2: BLOCK C	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
8.0	<b>DRY RISER INSTALLATION</b>				
	Galvanised mild steel (GMS) Class 'D' tubing to B.S. EN10255:2004 and fittings with screwed and socketed joints to B.S. 21 including fixing and jointing as described.				
8.1	<b>Piping</b>				
	100 mm diameter tubing	120	LM		
8.2	<b>Extra over tubing for the following:-</b>				
8.2.1	<b>Bend</b>				
	100 mm diameter flanged bends	6	No.		
8.2.2	<b>Equal Tees</b>				
8.2.2.1	100 x 100 x 100mm diameter Equal Tee	10	No.		
8.2.2.2	100 x 100 flanges (welded joints)	8	No		
8.2.2.3	100 x 65mm reducer	8	No		
8.2.3	<b>Valves</b>				
8.2.3.1	Non return valves 100mm	2	No		
8.2.3.2	Air release valve as Glenfield No 1260 'Apex' or equal and approved	2	No.		
8.3	Landing valve as Merry-Weather 'equerry' constant pressure outlet with flanged inlet and 1 no. 65mm female instantaneous outlet with a blank cap and chain as described.	8	No		
<b>Sub-Total Carried Forward to Page BQ - 46</b>					

ITEM	BILL 2: BLOCK C	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
8.4	<b>Breeching Inlet</b> Twin 65 mm diameter Fire Bridge breeching inlet with flanged connections and female quick coupling to B.S. 5041 and painted red.	2	No		
8.5	<b>Canvas Hose</b> 65 mm diameter 30 m long canvas hose designed to bust at a pressure of 34 bars. The hose shall have attached an instantaneous hose coupling branch pipe and nozzle to B.S. 336:1965.	8	No.		
8.6	<b>Hose Cradle</b> High quality fitting Hose Cradle designed for use in public buildings. The Cradle shall be made in aluminum throughout and shall be supplied with wall bracket and the finish shall be polished or chrome plated.	8	No		
8.7	<b>Testing and Commissioning</b> Allow for testing and commissioning of the whole of wet riser system to the satisfaction of the Engineer.	1	Item		
8.8	<b>Painting</b> Allow for painting of the pipes with 2 coats of red paint.	48	L.M.		
<b>Subtotal above</b>					
<b>Subtotal brought forward from Page BQ - 45</b>					
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ - 47</b>					



ITEM	BILL 2: BLOCK C - COLLECTION PAGE	AMOUNT (KSHS)
1	INTERNAL FOUL DRAINAGE, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ-31	
2	RAIN WATER DRAINAGE, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 32	
3	INTERNAL PLUMBING, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 36	
4	TANKS AND PUMPS, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 37	
5	SANITARY FITTINGS, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 41	
6	FIRE FIGHTING SYSTEMS, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 43	
7	PORTABLE FIRE EXTINGUISHERS, BROUGHT FORWARD FROM PAGE NO . BQ-44	
8	DRY RISER INSTALATION, BROUGHT FORWARD FROM PAGE NO . BQ - 46	
TOTAL FOR BLOCK C CARRIED FORWARD TO MAIN SUMMARY PAGE MS/1 BQ - 83		

ITEM	BILL 2: BLOCK D	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
1.0	<b>INTERNAL FOUL DRAINAGE</b>  Supply fix , test and commission the following in UPVC and MUPVC. Soil and waste system to BS4514 with fittings fixed to manufactures printed instructions and BS5572-1978. Tenders must allow in their pipe work and also where stated for pipe fixing clips or holder bolts plugged and screwed. Placed at intervals as per schedule in general mechanical specification.				
1.1	<b>FOUL DRAINAGE PIPE WORK</b>				
1.1.1	UPVC soil pipe 150mm diameter	40	LM		
1.1.2	UPVC soil pipe 100mm diameter	21	LM		
1.1.3	UPVC soil pipe 50mm diameter	77	LM		
1.1.4	UPVC soil pipe 40mm diameter	12	LM		
1.1.5	UPVC soil pipe 32mm diameter	25	LM		
1.2	<b>Extra over tubing for the following Bends / Elbows</b>				
1.2.1	150mm bends long 90 <sup>0</sup>	1	LM		
1.2.2	Long radius bends 100mm diameter	5	No		
1.2.3	Access Bend 100mm diameter 90 <sup>0</sup>	11	No		
1.2.4	Access Bend 50mm diameter 90 <sup>0</sup>	20	No		
1.2.5	Access Bend 40mm diameter 90 <sup>0</sup>	5	No		
1.2.6	Access Bend 32mm diameter 90 <sup>0</sup>	8	No		
<b>Sub-Total Carried Forward to Page BQ - 50</b>					

ITEM	BILL 2: BLOCK D	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
1.3	<b>Extra over tubing for the following Tees</b>				
1.3.1	150 x 100 x 150 Tee	6	No		
1.3.2	Single branch Tee 100 x 100 x 100mm	2	No		
1.3.3	Ditto but 50 x 32 x 50 mm dia	15	No		
1.3.4	75 x 50mm Reducers	11	No		
1.3.5	Access caps, Plug 100mm diameter	4	No		
1.3.6	Access caps, Plug 50mm diameter	10	No		
1.3.7	WC connectors 100mm	8	No		
1.3.8	100mm diameter air admittance valves	2	No		
1.3.9	150 x 75 mm diameter Boss Connector	11	No		
1.3.10	100 x 50 x 40 mm diameter 4-way Light Grey floor trap complete with stainless steel grating and cover.	7	No		
1.3.11	Grease trap	1	No		-
1.4	<b>MANHOLES</b> <b>Provide all materials, and construct manholes not exceeding 2000mm deep and not less than 450mm deep comprising the following:-</b> Concrete class 1:3:6 benching 150mm thick solid block wall Manhole finish 12mm water proofed cement and sand 1:2  <b>MANHOLE COVERS</b> Double sealed Access cover 450 x 600mm comprising: (a) Lower frame (GMS) (b) Cover (GMS) (c) Clamping strips (GMS) (d) Cover damping frame and fixing screws, all stainless steel as WADE specification Code No. R112.				
		2	No		
<b>Sub-Total Carried Forward to Page BQ - 50</b>					

ITEM	BILL 2: BLOCK D	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
1.5	<b>TESTING</b> Allow for water test and air test for the whole of internal drainage system as described to the satisfaction of the 1 Item Engineer.				
1.6	<b>EXCAVATION</b> Excavate trench for drainage pipes not exceeding 1000mm but average 600mm deep and return soil and cart away, balance. 40 LM Allow for pipe bedding material				
	<b>Subtotal Above</b>				
	<b>Subtotal brought forward from Page BQ - 48</b>				
	<b>Subtotal brought forward from Page BQ - 49</b>				
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ-66</b>					

ITEM	BILL 2: BLOCK D	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
2.0	<b>RAINWATER DRAINAGE</b>  Supply fix , test and commission the following in UPVC and MUPVC. Soil and waste system to BS4514 with fittings fixed to manufactures printed instructions and BS5572-1978. Tenders must allow in their pipe work and also where stated for pipe fixing clips or holder bolts plugged and screwed. Placed at intervals as per schedule in general mechanical specification.				
2.1	<b>Pipework:-</b>				
2.1.1	UPVC soil pipe 150mm diameter class D	150	LM		
2.2	<b>Extra over tubing for the following:-</b>				
2.2.1	<b>Bend/Tees</b>				
2.2.1.1	150mm diameter bend/elbow	6	No.		
2.2.1.2	150mm Vertical Rainwater Outlet	2	No.		
2.3	<b>MANHOLES</b>  <b>Provide all materials, and construct manholes not exceeding 2000mm and not less than 400mm deep deep comprising the following:-</b> Concrete class 1:3:6 benching 150mm thick solid block wall  Manhole finish 12mm water proofed cement and Sand 1:2  <b>MANHOLE COVERS</b>  Double sealed Access cover 450 x 600mm comprising:  (a) Lower frame (GMS) (b) Cover (GMS) (c) Clamping strips (GMS)  (d) Cover damping frame and fixing screws, all stainless steel as WADE specification Code No. R112.				
		3	No		-
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ-66</b>					

ITEM	BILL 2: BLOCK D	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
3.0	<b>INTERNAL PLUMBING</b>				
	Supply, fix, test and commission the followings:-  Supply and install CPVC water pipes including for hot water, fittings socketed joints, including fixind, and jointing as described, or approved equivalent. All pipe work for hot water circulation to be insulated with prefab styropore 40mm thick.				
3.1	<b>PIPE WORK</b>				
3.1.1	15mm diameter CPVC tubing	75	LM		
3.1.1.1	20mm diameter ditto	30	LM		
3.1.2	25mm diameter ditto	60	LM		
3.1.3	32mm diameter ditto	50	LM		
3.1.4	50mm diameter ditto	50	LM		
3.1.5	65mm diameter ditto	50	LM		
3.2	<b>Extra over tubing for the following Bends/Elbows</b>				
3.2.1	Ditto but for 20mm diameter	15	No		
3.2.2	Ditto but for 25mm diameter	20	No		
3.2.3	Ditto but for 32mm diameter	10	No		
3.2.4	Ditto but for 50mm diameter	10	No		
3.2.5	Ditto but for 65mm diameter	10	No		
3.3	<b>Extra over for Tees</b>				
3.3.1	20 x 20 x 20mm diameter equal tee	10	No		
3.3.2	25 x 20 x 25mm diameter tee	10	No		
<b>Sub-Total Carried Forward to Page BQ - 55</b>					

ITEM	BILL 2: BLOCK D	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
3.3.5	50 x 32 x 50mm diameter tee	20	No		
3.4	<b>REDUCERS</b>				
3.4.1	25 x 20mm diameter Ditto	4	No		
3.4.2	32 x 25mm diameter ditto	10	No		
3.4.3	40 x 32 mm diameter ditto	2	No		
3.4.4	50 x 40mm diameter ditto	4	No		
3.4.5	40 x 25mm diameter ditto	2	No		
3.4.6	50 x 25mm diameter ditto	2	No		
3.5	<b>UNIONS</b>				
3.5.1	20mm diameter Union	2	No		
3.5.2	Ditto but 25mm	2	No		
3.5.3	Ditto but 32mm	3	No		
3.5.4	Ditto but 40mm	2	No		
3.5.5	Ditto but 50mm	5	No		
3.5.6	Ditto but 65mm	1	No		
<b>Sub-Total Carried Forward to Page BQ - 55</b>					

ITEM	BILL 2: BLOCK D	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
3.6	<b>BRASS WORK</b>				
3.6.1	20mm diameter high pressure screw-down full-way non-rising stem gate valve as Peglar.	11	No		
3.6.2	Ditto but 25mm diameter	5	No		
3.6.3	Ditto but 32mm diameter	5	No		
3.6.4	Ditto but 50mm diameter	10	No		
3.6.5	Ditto but 65mm diameter	1	No		
3.6.6	Ball valve 65mm	2	No		
3.7	<b>STERILIZATION</b>				
	Allow for sterilization of the whole of the internal plumbing works by 70% chlorine as described to the satisfaction of the 1 Item Engineer.				
3.8	<b>PIPE SUPPORT FOR PIPES BELOW 100MM DIAMETER</b>				
	The pipe of diameter below 100mm shall be supported using supports as HILTI MPN-SI pipe ring, standard duty, 200 No galvanised with double connection boss thread M8/M10.				
	Supply, deliver to site, install, test and commission the Solar Water Heater with 300litre tank and 2 heating panels, the tank fitted with electric heating element as alternate heating source incase of dim sun light. The main tank shall be able to 2 No withstand working pressure of 10 bar and test pressure of 15bar. The complete set of the solar heater, complete with feed pump, shall be as Solair, or equal and approved.				
<b>Sub-Total Carried Forward to Page BQ - 55</b>					



ITEM	BILL 2: BLOCK D	AMOUNT (KSHS)
	<p><b>INTERNAL PLUMBING - COLLECTION PAGE</b></p> <p><b>Subtotal brought forward from Page BQ - 52</b></p> <p><b>Subtotal brought forward from Page BQ - 53</b></p> <p><b>Subtotal brought forward from Page BQ - 54</b></p>	
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO.</b> <b>BQ-66</b>		

ITEM	BILL 2: BLOCK D	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
4.0	<b>TANKS</b>				
4.1	<b>Supply, install, test and commission the following:-</b>  Pressed steel water storage tanks consisting of mass produced pressed steel panels bolted together in 1000mm square modules, hydraulically cold pressed in one piece and embossed with a distinctive star pressing at the centre to strengthen the panels. The tanks shall be 3000 x 2000 x 2000mm, high all to BS 4360 Grade 43A, painted with 2 coats of aluminium paint as made by Steel Structures or equivalent. The tank to be complete with the following:-  40mmØ inlet pipe connection  75mmØ outlet pipe connectors  75mmØ tank drain pipe connection  75mm Ø overflow pipe connection  Manhole and cover with mosquito proof mesh  75mm diameter plastic-metal coupling  40mm Ø ball valve				
4.2	<b>LADDER</b>				
	Tanks external ladder	2	No		
	Tank internal ladder	2	No		
	Tank level indicator	2	No		
	Painting of the ladders with primer and final coat same as the tanks.	2	No		
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ-66</b>					

ITEM	BILL 2: BLOCK D	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
5.0	<b>SANITARY FITTINGS</b>				
5.1	<b>Supply, install test and commission the following sanitary fitting below:-</b>				
5.1.1	Water closet as Twyford e100 standard round Vitreous China, white to B.S. 3402 comprising the following:-  WC bowl horizontal outlet 11068. Close coupled round cistern & fitting 6/4L BSIO, push button Seat and cover with soft closing mechanism and metal hinges or equal and approved	3	No.		
5.1.2	Water closet as Twyfordalcona btwv Vitreous China, white to B.S. 3402 comprising the following:- Seat and cover with soft closing mechanism and stainless steel hinges or equal and approved	5	No.		
5.1.3	Water close flushometer for Olympia BTW bowl, as Sloan systems model 150-1.6, with lower water consumption of approximately 6 litres per flush, as manufactured by Sloan company or equal and approved.	5	No		
5.1.4	Sloan Optima Electronic hand washing faucet sensor operated, model ETF -600C (8.4 lpm max) laminar flow spray head, 240 VAC /24 VAC 50/60 Hz (50 VA), or equal and approved.	8	No		
5.1.5	Wash Hand Basin as Twyford entice 570 countertop Vitreous China, white to B.S. 3402 with 1 centre hole, complete with 75 mm chrome plated bottle p-trap chrome plated waste and extension pipe with wall flange chrome plated.	8	No		
5.1.6	Urinal as Twyford Spectrum Comprising urinal bowl complete with fixing kit and outlet connector for one person, white to BS 3402.	3	No		
5.1.7	Sensor operated Urinal Flushometer as Sloan Optima model 195.0.5 WB ES.S complete with electrical accessories.	3	No		
5.1.8	Surface Mounted Automatic Hand Dryer as Bobrick model B-748, Chrome plated cover single phase motor, as described in Part C.	5	No		
<b>Sub-Total Carried Forward to Page BQ - 60</b>					

ITEM	BILL 2: BLOCK D	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
5.1.9	Wash Hand Basin as Twyford Sola 600 wall mounted Vitreous China, white to B.S. 3402 with 1 centre hole, complete with 75 mm chrome plated bottle p-trap chrome plated waste and extension pipe with wall flange chrome plated.	2	No.		
5.1.10	Tap as Twyford Sola 1/2" non concussive taps chrome plated CP to BSEN816	2	No.		
5.2	<b>DISABLED WASHROOM</b>				
5.2.1	Wash Hand Basin as Kohler Morning Side White, Vitreous China Wheelchair Lavatory with single hole drilling and soap dispenser on the right, Part No. K-12638-R.	1	No.		
5.2.2	Grab support rail to assist disabled as Twyford's Part No. 58432 PCO.	1	No		
5.2.3	Combined toilet roll holder and grab rail to assist disabled, as Twyford's Part No. 58438 PCO.	1	No		
5.2.4	Hinged support rail for use in disabled toilet facilities as Twyford's Part No. 58441 PCO.	1	No		
5.2.5	Back support with cushions for use in disabled water closets as Twyford's Part No. 58442 PCO.	1	No		
5.2.6	Spacer box to extend WC from wall to dimensions required under Building Regulations 1985 Appv. Doc. M or Dept. of Health Doc. HTM 64 as Twyford's Part No. 58446XXO, to suit Olympian WH WC bowl.	1	No		
5.3	<b>CLEANER'S SINK</b>				
	Cleaner's sink as Twyford highback sink with high splash back, easy clean stain resistsntt glazed surface and stailless steel hinged bucket grating complete with 75 mm chrome plated bottle p-trap chrome plated waste and extension pipe with wall flange chrome plated and tap	1	No		
Sub-Total Carried Forward to Page BQ - 60					

ITEM	BILL 2: BLOCK D	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
5.4	<b><u>WASHROOM ACCESSORIES</u></b>				
5.4.1	Single Jumbo Roll Tissue Dispenser	4	No		
5.4.2	Recessed Toilet Tissue Dispenser	1	No		
5.4.3	Sanitary Napkin Disposal	3	No		
5.4.4	Waste bin	5	No		
5.4	<b>Framed Mirror 6mm thick</b>				
5.4.1	600 x 800mm	3	No		
5.4.2	2400 x 800mm	2	No		
5.5	Towel Bar	2	No.		
5.6	Coat Hook with Bumper	8	No.		
5.7	Surface mounted Door Bumper	5	No		
5.8	Shower curtains and shower tray complete to form shower cubicles	2	No		
5.90	Concealed shower mixer complete with wall mounted high flow rate chrome plated shower head and chrome plated taps, as ROCCA Trijet Ref: No. 506300314, or equal and approved.	2	No		
5.1	Kitchen mixer as close holed shrivel mixer model S10106 from Hindustan sanitary ware, or equal and approved.	1	No		
5.11	Soap Dispenser	5	No		
5.12	Soap Dish	2	No		
<b>Sub-Total Carried Forward to Page BQ - 60</b>					

ITEM	BILL 2: BLOCK D	AMOUNT (KSHS)
	<p><b>SANITARY FITTINGS - COLLECTION PAGE</b></p> <p><b>Subtotal brought forward from Page BQ - 57</b></p> <p><b>Subtotal brought forward from Page BQ - 58</b></p> <p><b>Subtotal brought forward from Page BQ - 59</b></p>	
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ-66</b>		

ITEM	BILL 2: BLOCK D	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
6.0	<b>FIRE FIGHTING SYSTEMS</b>				
6.1	<b>HOSE REEL SYSTEM</b>				
	Galvanised Mild Steel (GMS) Class 'C' tubing to B.S. EN10255:2004 and fittings with screwed and socketed joints to BS 21				
6.1.1	<b>Pipework:-</b>				
6.1.1.1	25 mm diameter GMS tubing	4	L.M.		
6.1.1.2	50 mm diameter ditto	150	L.M.		
	<b>Extra over tubing for the following:-</b>				
6.1.2	<b>Bends</b>				
6.1.2.1	25 mm diameter bend	6	No.		
6.1.2.2	50mm diameter ditto	10	No		
6.1.2.3	50mm diameter union	8	No		
6.1.2.4	50mm diameter cap	2	No		
6.1.3	<b>Tees</b>				
6.1.3.1	50 x 50 mm diameter equal tee	2	No.		
6.1.3.2	50 x 25 mm diameter ditto	3	No.		
6.1.3.3	Air Vent valve	2	No		
6.1.4	<b>Brass work</b>				
6.1.4.1	50mm non return valves	2	No		
6.1.4.2	25 mm diameter high pressure gate valve as `Pegler' or equal and approved.	3	No.		
6.1.4.3	50mm diameter ditto	4	No		
6.1.5	<b>Orifice</b>	3	No		
<b>Sub-Total Carried Forward to Page BQ - 65</b>					

ITEM	BILL 2: BLOCK D	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
6.1.6	<b>Hose Reels</b>  Automatic, recessed swinging type hosereel with 45 meters long, 25 mm diameter reinforced rubber hose with adjustable nozzle. The hose is manufactured to BS EN 671-1 1995 5274 The hosereel shall be complete with fixing brackets and nozzle cradle. The hosereel should be manufactured to BS EN 694-2001 3169/2 1981 and be able to withstand maximum pressure of up to 15 bars.	4	No.		
<b>Sub-Total Carried Forward to Page BQ - 65</b>					



ITEM	BILL 2: BLOCK D	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
7.0	<b>PORTABLE FIRE EXTINGUISHERS</b>				
7.1	Supply, fix, test and commission of the following:-				
7.1.1	9 Litre polythene lined portable water/CO2 fire extinguisher to B.S 1288 including the appropriate initial charge and mounting brackets.	5	No		
7.1.2	6.0 Kg CO2 gas fire extinguisher to BS 5423 including the appropriate initial charge and mounting brackets.	1	No		
7.1.3	6.0 kg Dry Power fire extinguisher to B.S 3465 and 5423, including the appropriate initial charge and mounting brackets.	5	No		
<b>Sub-Total Carried Forward to Page BQ - 65</b>					

ITEM	BILL 2: BLOCK D	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
8.0	<b>DRY RISER INSTALLATION</b>  Galvanised mild steel (GMS) Class 'D' tubing to B.S. EN10255:2004 and fittings with screwed and socketed joints to B.S. 21 including fixing and jointing as described.				
8.1	<b>Piping</b>  100 mm diameter tubing	50	LM		
8.2	<b>Extra over tubing for the following:-</b>				
8.2.1	<b>Bend</b>  100 mm diameter flanged bends	4	No.		
8.2.2	<b>Equal Tees</b>				
8.2.2.1	100 x 100 x 100mm diameter Equal Tee	3	No.		
8.2.2.2	100 x 100 flanges (welded joints)	3	No		
8.2.2.3	100 x 65mm reducer	3	No		
8.2.3	<b>Valves</b>				
8.2.3.1	Non return valves 100mm	1	No		
8.2.3.2	Air release valve as Glenfield No 1260 'Apex' or equal and approved	1	No.		
8.3	Landing valve as Merry-Weather 'equerry' constant pressure outlet with flanged inlet and 1 no. 65mm female instantaneous outlet with a blank cap and chain as described.	3	No		
<b>Sub-Total Carried Forward to Page BQ - 65</b>					

ITEM	BILL 2: BLOCK D	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
8.4	<b>Breeching Inlet</b> Twin 65 mm diameter Fire Bridge breeching inlet with flanged connections and female quick coupling to B.S. 5041 and painted red.	1	No		
8.5	<b>Canvas Hose</b>  65 mm diameter 30 m long canvas hose designed to bust at a pressure of 34 bars. The hose shall have attached an instantaneous hose coupling branch pipe and nozzle to B.S. 336:1965.	3	No.		
8.6	<b>Hose Cradle</b>  High quality fitting Hose Cradle designed for use in public buildings. The Cradle shall be made in aluminum throughout and shall be supplied with wall bracket and the finish shall be polished or chrome plated.	3	No		
8.7	<b>Testing and Commissioning</b>  Allow for testing and commissioning of the whole of wet riser system to the satisfaction of the Engineer.	1	Item		
8.8	<b>Painting</b>  Allow for painting of the pipes with 2 coats of red paint.	20	L.M.		
	Supply, deliver to site, install, test and commission the Inert gas Inergen fire suppression system, to a server room 5m X 4m X 2.8m	1	Item		
<p style="text-align: center;"><b>Subtotal above</b></p> <p style="text-align: center;"><b>Subtotal brought forward from Page BQ - 61</b></p> <p style="text-align: center;"><b>Subtotal brought forward from Page BQ - 62</b></p> <p style="text-align: center;"><b>Subtotal brought forward from Page BQ - 63</b></p> <p style="text-align: center;"><b>Subtotal brought forward from Page BQ - 64</b></p>					
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ-66</b>					

ITEM	BILL 2: BLOCK D - COLLECTION PAGE	AMOUNT (KSHS)
1	INTERNAL FOUL DRAINAGE, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ-50	
2	RAIN WATER DRAINAGE, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 51	
3	INTERNAL PLUMBING, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 55	
4	TANKS AND PUMPS, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 56	
5	SANITARY FITTINGS, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 60	
6	FIRE FIGHTING SYSTEMS, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 65	
TOTAL FOR BLOCK D CARRIED FORWARD TO MAIN SUMMARY PAGE MS/1 BQ - 83		

ITEM	BILL 3: COMMON SERVICES	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
1.0	<b>FOUL DRAINAGE</b>  Supply fix , test and commission the following in UPVC and MUPVC. Soil and waste system to BS4514 with fittings fixed to manufactures printed instructions and BS5572-1978. Tenderers must allow in their pipe work and also where stated for pipe fixing clips or holder bolts plugged and screwed. Placed at intervals as per schedule in general mechanical specification.				
1.1	<b>FOUL DRAINAGE PIPE WORK</b>				
1.1.2	UPVC soil pipe 100mm diameter	100	LM		
1.1.3	UPVC soil pipe 50mm diameter	5	LM		
1.1.4	UPVC soil pipe 32mm diameter	2	LM		
1.2	<b>Extra over tubing for the following Bends / Elbows</b>				
1.2.1	Long radius bends 100mm diameter	3	No		
1.2.2	Access Bend 32mm diameter 90 <sup>0</sup>	3	No		
1.2.3	Access caps, Plug 32mm diameter	1	No		
1.3	WC connectors 100mm	1	No		
1.4	100 x 50 x 40 mm diameter 4-way Light Grey floor trap complete with stainless steel grating and cover.	1	No		
1.5	300x300x200mm deep masonry gulley trap complete with 100mm u-PVC P-trap gully with grating of mild steel	1	No		
1.6	<b>MANHOLES</b>  <b>Provide all materials, and construct manholes not exceeding 2000mm deep comprising the following:-</b>  Concrete class 1:3:6 benching 150mm thick solid block wall  Manhole finish 12mm water proofed cement and Sand 1:0				
<b>Sub-Total Carried Forward to Page BQ - 68</b>					

ITEM	BILL 3: COMMON SERVICES	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
	<b>MANHOLE COVERS</b> Double sealed Access cover 450 x 600mm comprising: (a) Lower frame (GMS) (b) Cover (GMS) (c) Clamping strips (GMS) (d) Cover damping frame and fixing screws, all stainless steel as WADE specification Code No. R112.	6	No		
1.5	<b>TESTING</b> Allow for water test and air test for the whole of internal drainage system as described to the satisfaction of the Engineer.	1	Item		
1.6	<b>EXCAVATION</b> Excavate trench for drainage pipes not exceeding 1000mm but average 600mm deep and return soil and cart away, balance. Allow for pipe bedding material	90	LM		
1.7	<b>TANKS</b> <b>Supply, install, test and commission the following:-</b>  Pressed steel water storage tanks consisting of mass produced pressed steel panels bolted together in 1000mm square modules, hydraulically cold pressed in one piece and embossed with a distinctive star pressing at the centre to strengthen the panels. The tanks shall be 5000 x 5000 x 4000mm, high all to BS 4360 Grade 43A, painted with 2 coats of aluminum paint as made by Steel Structures or equivalent one for rain water, (one for treated water and one for portable water). The tank to be complete with the following:-  40mmØ inlet pipe connection 75mmØ outlet pipe connectors 75mmØ tank drain pipe connection 75mm Ø overflow pipe connection Manhole and cover with mosquito proof mesh 75mm diameter plastic-metal coupling 40mm Ø ball valve	3	No		
1.8	<b>LADDER</b> Tanks external ladder Tank internal ladder Tank level indicator Painting of the ladders with primer and final coat same as the tank	3 3 3 3	No No No No		
<p style="text-align: center;"><b>Subtotal above</b> <b>Subtotal brought forward from Page BQ - 67</b></p>					
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ-78</b>					

ITEM	BILL 3: COMMON SERVICES	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
2.0	<b>RAINWATER DRAINAGE</b>  Supply fix , test and commission the following in UPVC and MUPVC. Soil and waste system to BS4514 with fittings fixed to manufactures printed instructions and BS5572-1978. Tenders must allow in their pipe work and also where stated for pipe fixing clips or holder bolts plugged and screwed. Placed at intervals as per schedule in general mechanical specification.				
2.1	<b>Pipework:-</b>				
2.1.1	UPVC soil pipe 100mm diameter class D	24	LM		
2.2	<b>Extra over tubing for the following:-</b>				
2.2.1	<b>Bend/Tees</b>				
2.2.1.1	100mm diameter bend/elbow	6	No.		
2.2.1.2	100mm Vertical Rainwater Outlet	6	No.		
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ - 78</b>					

ITEM	BILL 3: COMMON SERVICES	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
3.0	<b>EXTERNAL PLUMBING</b>				
	<b>Supply, fix, test and commission the followings:-</b>				
	CPVC Tubing and fittings with socketed joints including fixing and jointing as described , and following scheme drawings, or an approved equivalent material.				
3.1	<b>PIPE WORK</b>				
3.1.1	25 mm diameter CPVC tubing	200	LM		
3.1.2	40 mm diameter CPVC tubing	350	LM		
3.1.3	50 mm diameter CPVC tubing	30	LM		
3.2	<b>Extra over tubing for the following Bends/Elbows</b>				
3.2.1	25 mm diameter	18	No		
3.2.2	Ditto but for 40mm diameter	25	No		
3.2.3	Ditto but for 50mm diameter	20	No		
3.2	<b>Tees</b>				
3.2.1	40mm equal	10	No		
3.2.2	50mm equal tee	8	No		
3.2.3	50X25X50MM Tee	5	No		
	50x20x50mm Tee	7	No		
	50x15x50mm Tee	3	No		
	25x15x25mm Tee	5	No		
3.3	<b>UNIONS</b>				
	15mm	5	No		
	20mm	5	No		
3.3.1	25mm	10	No		
3.3.2	Ditto but 40mm	10	No		
3.3.3	Ditto but 50mm	12	No		
<b>Sub-Total Carried Forward to Page BQ - 72</b>					



ITEM	BILL 3: COMMON SERVICES	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
3.3	<b>UNIONS</b>				
	15mm	5	No		
	20mm	5	No		
3.3.1	25mm	10	No		
3.3.2	Ditto but 40mm	10	No		
3.3.3	Ditto but 50mm	12	No		
3.4	<b>BRASS WORK</b>				
3.4.1	40 mm diameter high pressure screw-down full-way non-rising stem gate valve as Peglar.	20	No		
	Ditto but 15mm	4	No		
	Ditto but 20mm	5	No		
3.4.2	Ditto But 25 mm	20	No		
3.4.3	Ditto but 50 mm	10	No		
3.4.3	Non Return 40 mm diameter	11	No		
3.5	<b>STERILIZATION</b>				
	Allow for sterilization of the whole of the internal plumbing works by 70% chlorine as described to the satisfaction of the Engineer.	1	Item		
3.6	<b>EXCAVATION</b>				
	Excavate trench for drainage pipes not exceeding 1000mm but average 600mm deep and return soil and cart away, balance. Allow for pipe bedding material	450	LM		
3.7	<b>CONCRETE PROTECTION</b>				
	Allow for concrete protection when passing under roads and slab	1	Item		
3.8	Supply and install chlorine dozer complete with carbon and sand filters	1	No		
<b>Sub-Total Carried Forward to Page BQ - 72</b>					

ITEM	BILL 3: COMMON SERVICES	AMOUNT (KSHS)
	<p><b>EXTERNAL PLUMBING - COLLECTION PAGE</b></p> <p><b>Subtotal brought forward from Page BQ - 70</b></p> <p><b>Subtotal brought forward from Page BQ - 71</b></p>	
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ - 78</b>		

ITEM	BILL 3: COMMON SERVICES	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
4.0	<b>SANITARY FITTINGS</b>				
4.1	<b>Supply, install test and commission the following sanitary fittings for Gate House as below:-</b>				
4.1.1	Water closet as Twyford's e100 standard round Vitreous China, white to B.S. 3402 comprising the following:-  WC bowl horizontal outlet 11068. Close coupled round cistern & fitting 6/4L BSIO, push button Seat and cover with soft closing mechanism and metal hinges or equal and approved	1	No.		
4.1.2	Wash Hand Basin as Twyford Sola 600 wall mounted Vitreous China, white to B.S. 3402 with 1 centre hole, complete with 75 mm chrome plated bottle p-trap chrome plated waste and extension pipe with wall flange chrome plated.	1	No.		
4.1.3	Tap as Twyford Sola 1/2" non concussive taps chrome plated CP to BSEN816	1	No		
4.1.4	Recessed Toilet Tissue Dispenser	1	No		
4.1.5	Sanitary Napkin Disposal	1	No		
4.1.6	Waste bin	1	No		
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ - 78</b>					

ITEM	BILL 3: COMMON SERVICES	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
5.0	<b>PUMPS</b>				
5.1	<p>Transfer pumps as Dayliff Pressure set complete as Dailiff DB 12 - 50 horizontal multistage centrifugal pump, ONE DUTY THE OTHER STANDBY complete with a 2.82kW 3 ph 2900rpm squirrel cage motor. The pump shall be complete with GWS60 pressure vessel. Each pump is capable of delivering up to 7cu.m/hr at 45m or equal and approved. The pump shall be complete with control panel and be BMS compatible.</p> <p><b>CONTROL PANELS</b></p> <p>The control panel is to be located in the position indicated on the contract drawings.</p> <p>The control panel shall be constructed of mild steel, be moisture ,insect and rodent proof and shall be provided complete with spare fuses and wiring diagram enclosed in plastic laminate.</p> <p>The pump shall be controlled by a flow switch therefore the control panel shall include the following:</p> <p>On push button for setting control panels</p> <p>Green indicator light for indicating control panel live.</p> <p>Duty/standby, auto changeover</p> <p>Duty pump, run green indicator light</p> <p>Standby pump, run green indicator light.</p> <p>Duty pump fail red indicator light</p> <p>Standby pump, fail red indicator light.</p> <p>Low water condition pump cut-out with red indicator light.</p> <p>The pumps are to be protected by a low level cut-out switch to prevent dry pump run when low-level water conditions occur.</p>	4	No		
		Item	1		
5.2	<p>Transfer pumps for rain water shall be DAB EBS 800 automatic pressure pump. The unit shall be a 3 stage centrifugal booster pump with ware cooled motor. The motor is rated 0.8KW at 2900rpm. The unit shall be supplied complete with a pressure vessel, on a common base plate,or equivalent.</p>	2	No		
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ - 78</b>					

ITEM	BILL 3: COMMON SERVICES	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
<b>6.0</b>	<b>WASTE WATER TREATMENT PLANT</b>  Supply, deliver, install and commission a packaged Black Water Treatment Plant of capacity 75 cubic metres per day. The plant is a Moving Bed Bio Reactor (MBBR) type as specified in the Tender Document.  The plant shall incorporate sludge, filtration pumps (duty/standby), bar screen coarse, oil and grease separator, fine screen, air blowers, suction pumps, disinfection dosing system etc.  Unit to be complete with interconnecting pipes, fittings, valves and all the necessary controls.				
6.1.1	<b>Pre-treatment:-</b> Bar Screen Manual bar screen of 5mm Internals for oil and grease tank	1 1	No No		
6.1.2	<b>Biological Treatment</b> Bio media shall be of high quality. MBBR Tank shall consist of Aeration Tank, Settling Tank and Chlorination Tank in Mild Steel FRP lined.	1	No		
6.1.3	<b>Chlorine Dosing System</b>  Plant associated piping and fittings including all the valves, nipples, couplings, connectors, joints etc as required in the running lengths of pipework and also where necessary, for pipe fixing clips, holder bats plugged and screwed	1 1	No Item		
6.2	<b>Diffusers</b> Coarse bubble diffusers:- Pressed PVC pipe with holes on the surface for air ejection with necessary accessories etc complete (for equalisation tank and final tank) Size - Equalisation tank, sludge holding tank - 90mmdia x 800mm long Fine pore diffusers:- Long membrane of EPDM supported on PVC pipe secured at the ends by SS clamps and construction with necessary accessories etc. Size - 90mm dia x 1,000mm long				
6.2.1		10	N0		
6.2.2		8	No		
6.3	<b>Raw effluent pumpset</b> Duty 6 m <sup>3</sup> /h @ 12m head with level switch in sump size 600 x 600 x 600mm with perforated stainless steel grating. Power: 240V 50Hz. 1Ph. 1.0kW (grating & sump by MC). To transfer raw effluent from the equalization tank to Aeration / FMR tank				
6.3.1		2	Set		
<b>Sub-Total Carried Forward to Page BQ - 77</b>					

ITEM	BILL 3: COMMON SERVICES	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
	<b>Control panel</b> Control panel for the plant consisting of power on, pump run and trip indicator lights, lights; ammeter; relays with over and under voltage protection; float switch for low water level cut-out, pressure switches	1	No		
6.3.2	<b>Electrical wiring</b> Associated electrical wiring from Control panels to the pumps motor terminals. (2 sets)	1	Item		
6.3.3	Air Blowers within two metres of equipment	1	Item		
6.3.4	<b>6.4 Water Tanks</b> <b>Note:</b> Each bidder should give the capacities that they require for the below water tanks to be in RCC or Plastic				
6.4.1	Collection / Equalization tank RCC	1	No		
6.4.2	Final treated water tank plastic	1	No		
6.4.3	Sludge holding tank RCC	1	No		
6.4.4	Pressure gauges, to be fitted as instructed by the Engineer	3	No		
	<b>6.5 Pipework</b>				
6.5.1	Air pipework:- Allow for air pipework installation (uPVC or HDPE Pipes) complete with all the couplings, connectors, joints etc as required in the running lengths of pipework and also where necessary, for pipe fixing clips, holderbats plugged and screwed.	1	Item		
6.5.2	Inter-connecting pipework:- Allow for air pipework installation (uPVC or HDPE Pipes) complete with all the couplings, connectors, joints etc as required in the running lengths of pipework and also where necessary, for pipe fixing clips, holderbats plugged and screwed.	1	Item		
	<b>6.6 Instruments:-</b> Level Switches for the Tanks and Pressure gauges	1	Item		
	<b>6.7 Testing and Commissioning</b>				
6.7.1	Allow for setting to work, testing and commissioning	1	Item		
6.7.2	Instruction and Maintenance Allow for instruction to the client staff the operation and maintenance of the Grey waste water treatment plant system and initial maintenance during the six months defects liability period.	1	Item		
6.7.3	Record Drawings Allow for preparation of record (as installed) drawings, operation and maintenance manuals	1	Item		
<b>Sub-Total Carried Forward to Page BQ - 77</b>					

ITEM	BILL 3: COMMON SERVICES	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
<b>6.80</b>	<p><b>Electrical Connections</b> Allow for all the electrical wiring, cables, cable trays as required to be a part of the supply and to be done by a licensed electrician</p> <p>Connections</p> <p>Allow for liasing with main contractor, plumbing and electrical sub-contractors in all areas that involve services to be connected to the black water treatment plant services.</p> <p>Co-ordination:- Allow for co-ordination/liasing with the main contractor, plumbing and electrical sub-contractors, project manager, client, Architect and Consultants to establish the plant and to run the plant successfully</p> <p>Plant Commissioning Commissioning by the supplier will be deemed complete only when the Black water treatment plants inspected and certified by a Certified Authorised Black water treatment plant Inspector</p> <p><b>Guarantee and Maintenance</b> Allow for 1 year guarantee and six months maintenance including spares but excluding fuel for the Black water treatment plant system</p> <p><b>Testing</b> Allow for testing the pipework and equipment supplied under this contract to the satisfaction of the Engineers.</p> <p>Any item not specified but necessary for the satisfactory installation and operation of the entire Black water treatment plant system within Specify.....</p>	1	Set		
		1	Item		
		1	Item		
		1	Item		
		1	Item		
		1	Item		
		1	Item		
<p style="text-align: center;"><b>Subtotal above</b></p> <p style="text-align: center;"><b>Subtotal brought forward from Page BQ - 75</b></p> <p style="text-align: center;"><b>Subtotal brought forward from Page BQ - 76</b></p>					
<b>TOTAL CARRIED FORWARD TO COLLECTION PAGE NO. BQ-78</b>					

ITEM	BILL 3: COMMON SERVICES - COLLECTION PAGE	AMOUNT (KSHS)
1	FOUL DRAINAGE, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 68	
2	RAIN WATER DRAINAGE, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 69	
3	EXTERNAL DRAINAGE, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 72	
4	SANITARY FITTINGS, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 73	
5	PUMPS, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 74	
6	WASTE WATER TREATMENT PLANT, TOTAL BROUGHT FORWARD FROM PAGE NO. BQ - 77	
TOTAL FOR BLOCK D CARRIED FORWARD TO MAIN SUMMARY PAGE MS/1 BQ - 83		



ITEM	BILL 4: EXTERNAL WATER SUPPLY	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
<b>1</b>	<b>GENERAL</b>				
<b>1.1</b>	Allow for pipeline testing, including all necessary equipment, materials and works necessary for testing, such as transportation and use of water, pipe fittings, disposal of used water.	m	1400		
<b>1.2</b>	Allow for disinfection of pipeline by flushing with clear water and filling with water containing 0.05 g/l calcium hypochlorite, left for 24 hours. This includes supply of all necessary equipment, materials, chemicals and water, measurement of residual chlorine all as specified.	m	1400		
<b>1.3</b>	Provisional Sum for connection of water to Achego campus including application and payment of connection fee	PS	1		
<b>1.4</b>	Provisional Sum for organising logistics, notice for interruption and facilitation of SIBOWASCO while making connection to existing operational pipe	PS	1		
<b>2</b>	<b>SITE CLEARANCE</b>				
<b>2.1</b>	General bush clearance along pipe line wayleave 2 m wide to remove under growth, grass, roots, etc	m	1400		
<b>2.2</b>	Remove trees and stumps, girth n.e. 300mm (provisional)	nr	10		
<b>3</b>	<b>EXCAVATION AND BACKFILLING</b> excavation includes stripping top soil, laying aside, preparation of surfaces, disposal of excavated material, shoring sides of excavation and keeping excavations water free. Backfilling entails transporting, spreading and ramming approved backfill material in layers to the satisfaction of project Engineer				
<b>3.1</b>	Excavation to maximum depth of 1.0m in soft material	m <sup>3</sup>	300		
<b>3.2</b>	Excavation in hard material upto a maximum depth of 1.0m	m <sup>3</sup>	480		
<b>3.3</b>	Excavation in rock material, all depths	m <sup>3</sup>	60		
<b>3.4</b>	Backfill with in-situ excavated material <i>Extras over backfilling</i>	m <sup>3</sup>	678		
<b>3.5</b>	Sand surround to pipe, 150mm all round the pipe	m <sup>3</sup>	14.063		
<b>3.6</b>	Imported granular fill material, approved, compacted in layers to 300mm above crown of the pipe	m <sup>3</sup>	72		
<b>3.7</b>	Selected fill material from excavated soil compacted in layers to 300mm above crown of the pipe	m <sup>3</sup>	90		
<b>Sub-Total Carried Forward to Page BQ - 82</b>					

ITEM	BILL 4: EXTERNAL WATER SUPPLY	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
3.8	Pipe haunching with class 15 concrete	m <sup>3</sup>	25		
4	<b>PIPELAYING</b> Supply and transport to site. Transport from site store, lay and join pipes in trench				
4.1	75mm diameter uPVC pipe class 'C' (PN10)	m	1000		
4.2	32mm diameter uPVC pipe class 'C' (PN10)	m	300		
4.3	DN65 GI pipe class 'B' - provisional <i>Extras over pipelaying</i>	m	100		
4.4	Cast in place thrust and anchor blocks, less than 0.5m <sup>3</sup> Tarmarc road crossing by tunnelling, n.e 100mm diameter,	nr	5		
4.5	through single carriageway, 2 lanes road. Include for pipe sleeving	nr	1		
4.6	Murram road crossing by cutting, approximately 15m wide	nr	2		
4.7	Supply and join 75mm diameter class 'C' elbows	nr	10		
4.8	Supply and join 75mm diameter class 'C' 45deg bends	nr	5		
4.9	Supply and install 1nr DN25 air valve, small orifice – provisional <i>Chambers and other ancillaries</i>	nr	1		
4.10	Construction of standard 1.2m x 1.2m n.e. 2.0m deep masonry valve chamber with lockable covers – provisional Construction of DN50 washout complete with standard 1.2m x 1.2m n.e. 2.0m deep masonry chamber, isolating valve, 50m	nr	2		
4.11	DN50 uPVC pipe to outfall, flap valve and outfall protection works – provisional	nr	1		
4.12	Precast concrete marker post of class 25 concrete, rate to include cost for excavations and mass concrete to post surround	nr	3		
5	<b>TIE-IN WORKS</b> <i>Supply and installation of fittings (NP16 rating)</i>				
5.1	DN250 flange adaptor	nr	1		
5.20	DN250 flexible coupling	nr	1		
5.3	DN250 single flanged pipe piece, L=0.50m	nr	1		
<b>Sub-Total Carried Forward to Page BQ - 82</b>					

ITEM	BILL 4: EXTERNAL WATER SUPPLY	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
5.4	DN250-DN100 all-flanged steel reducing tee, epoxy coated internally and externally	nr	1		
5.5	DN100-DN80 double flanged steel taper, epoxy coated internally and externally	nr	1		
5.6	DN80-DN65 all flanged GI concentric taper	nr	1		
5.7	DN65 ranger flexible coupling, epoxy coated internally and externally	nr	1		
5.8	DN65 gate valve	nr	1		
	<i>Chambers and other ancillaries</i>				
5.9	Standard masonry valve chamber 1.5m x 1.5m internal dimensions n.e. 2.5m deep complete with lockable cover	nr	1		
5.1	Precast concrete marker post of class 25 concrete, rate to include cost for excavations and mass concrete to post surround	nr	1		
6	<b>TERMINATION OF PIPE</b>				
	<i>Supply and installation of fittings</i>				
6.1	DN65 PVC-GI adaptor, female threaded, PN10	nr	1		
6.20	DN65-DN50 GI adaptor, class 'B'	nr	1		
6.3	DN50 gate valve, 'Pegler' or better	nr	2		
6.4	DN25 gate valve, 'Pegler' or better	nr	1		
6.5	DN50 GI pipe class 'B'	m	6		
6.6	DN25 GI pipe class 'B'	m	6		
6.7	DN50 x 50 GI equal tee, female threaded on all ends	nr	2		
6.8	DN50 GI plug	nr	1		
6.9	DN50 bulk water meter	nr	1		
6.10	DN25 consumer water meter	nr	1		
6.11	Lump Sum for connection and jointing fittings	LS	1		
	<i>Chambers and other ancillaries</i>				
6.12	Standard 1.2m x 1.2m n.e. 2m deep masonry valve chamber complete with lockable covers	nr	1		
<b>Sub-Total Carried Forward to Page BQ - 82</b>					

ITEM	BILL 4: EXTERNAL WATER SUPPLY - COLLECTION PAGE	AMOUNT (KSHS)
1	Subtotal brought forward from Page BQ - 79	
2	Subtotal brought forward from Page BQ - 80	
3	Subtotal brought forward from Page BQ - 81	
	SUB-TOTAL 1	
4	ADD 10% PHYSICAL CONTIGENCIES	
	SUBTOTAL 2	
5	ADD 14% VAT	
TOTAL FOR BLOCK D CARRIED FORWARD TO MAIN SUMMARY PAGE MS/1 BQ - 83		

ITEM	MAIN SUMMARY PAGE MS/1	AMOUNT (KSHS)																								
	<table> <tr> <th>ITEM</th><th>BROUGHT FORWARD FROM</th><th>PAGE</th></tr> <tr> <td>1</td><td>BILL 1: PRELIMINARIES</td><td>3</td></tr> <tr> <td>2</td><td>BILL 2: BLOCK A</td><td>8</td></tr> <tr> <td>3</td><td>BILL 2: BLOCK B</td><td>27</td></tr> <tr> <td>4</td><td>BILL 2: BLOCK C</td><td>47</td></tr> <tr> <td>5</td><td>BILL 2: BLOCK D</td><td>66</td></tr> <tr> <td>6</td><td>BILL 3: COMMON SERVICES</td><td>78</td></tr> <tr> <td>7</td><td>BILL 4: EXTERNAL WATER SUPPLY</td><td>82</td></tr> </table>	ITEM	BROUGHT FORWARD FROM	PAGE	1	BILL 1: PRELIMINARIES	3	2	BILL 2: BLOCK A	8	3	BILL 2: BLOCK B	27	4	BILL 2: BLOCK C	47	5	BILL 2: BLOCK D	66	6	BILL 3: COMMON SERVICES	78	7	BILL 4: EXTERNAL WATER SUPPLY	82	
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7	BILL 4: EXTERNAL WATER SUPPLY	82																								
GRAND TOTAL CARRIED TO FORM OF TENDER																										

## **SECTION XII: TECHNICAL SCHEDULE OF ITEMS TO BE SUPPLIED**

### **TECHNICAL SCHEDULE**

- 1.0. The technical schedule shall be submitted by tenderers to facilitate and enable the Project Manager to evaluate the tenders.
- 2.0. The filling of this schedule forms part of Technical Evaluation of the tenders, and tenderers shall therefore be required to indicate the type/make and country of origin of all the materials and equipment they intend to offer to the employer in this schedule.
- 3.0. Any bid returned with unfilled Technical Schedule shall be considered technically non-responsive, and the tenderer shall automatically be disqualified.

TECHNICAL SCHEDULE OF ITEMS TO BE SUPPLIED

(To be Completed by the Tenderer as a Mandatory Requirement)

SECTION:.....TITLE:.....

EQUIPMENT.....

ITEM	DESCRIPTION	TYPE/MAKE	COUNTRY OF ORIGIN
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

### **SECTION XIII**

#### **SCHEDULE OF SUB-CONTRACT DRAWINGS**

DRAWING NO.	DRAWING TITLE



#### SECTION XIV – STANDARD FORMS

- i. Letter of Acceptance
- ii. Form of Agreement
- iii. Performance Bank Guarantee
- iv. Qualification Information
- v. Tender Questionnaire
- vi. Confidential Business Questionnaire
- vii. Details of Sub-Contractors
- viii. Letter of Notification of Award
- ix. Request for Review
- x. Anti-Corruption Declaration Commitment/Pledge
- xi. Non-Debarment Statement
- xii. Statement of Compliance
- xiii. Details of Litigations or Arbitration Proceedings

## LETTER OF ACCEPTANCE

[Letterhead paper of the Employer]

\_\_\_\_\_ [Date]

To: \_\_\_\_\_  
[Name of the Sub-contractor]

\_\_\_\_\_  
[Address of the Sub-contractor]

Dear Sir,

This is to notify you that your Tender dated .....for the execution  
of.....

[name of the Sub-contract and identification number, as given in the Tender documents] for the

Sub-contract Price of Kshs..... [amount in figures][Kenya

Shillings]..... (amount in words) in

accordance with Instructions to Tenderers is hereby accepted

You are hereby instructed to proceed with the execution of the said Works in accordance with the  
Sub-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 Sub-contractor”) of the other part.

WHEREAS THE Employer is desirous that the Sub-contractor executes ..... (Name and identification number of Sub-contract) (Hereinafter called “the Works”) located at ..... [Place/location of the Works] and the Employer has accepted the tender submitted by the Sub-contractor for the execution and completion of such Works and the remedying of any defects therein for the Sub-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 Sub-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 Sub-contract Part I
  - (iv) Conditions of Sub-contract Part II and Appendix to Conditions of Sub-contract
  - (v) Specifications
  - (vi) Drawings
  - (vii) Priced Bills of Quantities
3. In consideration of the payments to be made by the Employer to the Sub-contractor as hereinafter mentioned, the Sub-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 Sub-contract.
4. The Employer hereby covenants to pay the Sub-contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Sub-contract Price or such other sum as may become payable under the provisions of the Sub-contract at the times and in the manner prescribed by the Sub-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 Sub-contractor-----

In the presence of (i) Name -----

Address -----

Signature -----

[ii] Name -----

Address -----

Signature -----

## PERFORMANCE BANK GUARANTEE

To: .....

.....(Name of Employer.....(Date)

.....(Address of Employer)

Dear Sir,

WHERE AS .....(hereinafter called “the Sub-contractor”) has undertaken, in pursuance of Sub-contract No.....dated.....to execute ..... (hereinafter called “the Works”

AND WHEREAS it has been stipulated by you in the said Sub-contract that the Sub-contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligations in accordance with the Sub-contract;

AND WHEREAS we have agreed to give the Sub-contractor such a Bank Guarantee:  
NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Sub-contractor, up to a total of Ksh------(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 cavil 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 Sub-contractor before presenting us with the demand.

We further agree that no change, addition or other modification of the terms of the Sub-contract or of the Works to be performed thereunder or of any of the Sub-contract documents which may be made between you and the Sub-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 -----

## 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 Tenderer .....

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

Year	Volume	
	Currency	Value

#### 1.3 Schedule of completed projects of similar nature and volume over the last five years.

Project name	Name of client and contact person	Type of work performed and year of completion	Value of sub-contract

1.4 Schedule of on-going projects of similar nature and volume.

Project name	Name of client and contact person	Type of work performed	Value of sub-contract

1.5 Major items of Sub-contractor's Equipment proposed for carrying out the Works. List all information requested below.

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

1.6 Qualifications and experience of key personnel proposed for administration and execution of the Sub-contract. Attach biographical data.

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

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

- a) .....
- b) .....
- c) .....

1.8 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. .\_\_\_\_\_.
- 2. .\_\_\_\_\_.
- 3. .\_\_\_\_\_.
- 4. .\_\_\_\_\_.
- 5. .\_\_\_\_\_.
- 6. .\_\_\_\_\_.
- 7. .\_\_\_\_\_.
- 8. .\_\_\_\_\_.
- 9. .\_\_\_\_\_.
- 10. .\_\_\_\_\_.

1.9 Tenderer's Bank Information

NAME OF BANK	BANK BRANCH	ADDRESS	TELEPHONE

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



## 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 address 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 2 (c) and 2 (d) 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:

Name in full	Nationality	Citizenship Details	Shares
1.....			
2.....			
3.....			

### Part 2(c) – Registered Company:

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

## 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 Sub-contract value:

.....

.....

(iii) Sub-contractor's experience of similar works carried out in the last 3 years with Sub-contract value:

.....

.....

2) 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 Sub-contract value:

.....

.....

(iii) Sub-contractor's experience of similar works carried out in the last 3 years with Sub-contract value:

.....

.....

[Signature of Tenderer)

Date

## LETTER OF NOTIFICATION OF AWARD

To:

Name and Address of Sub-Contractor

RE: Tender No. \_\_\_\_\_

Tender Name \_\_\_\_\_

This is to notify that the sub-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 sub-contract/sub-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 OFFICE

## REQUEST FOR REVIEW

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) of  
.....dated the.....day of ..... 20 ..... in the matter of Tender  
No.....of .....20...

### 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 of  
.....20.....

SIGNED

Board Secretary

## **ANTI – CORRUPTION POLICY IN THE PROCUREMENT PROCESS**

### **UNDERTAKING BY BIDDER ON ANTI – CORRUPTION POLICY / CODE OF CONDUCT AND COMPLIANCE PROGRAMME**

The governments of Kenya is committed to fighting corruption in all its forms and in all its institutions to ensure that all the government earned revenues are utilized prudently and for the purpose intended with a view to promoting economic development as the country work towards actualizing Vision 2030.

Here at Jaramogi Oginga Odinga University of Science and Technology and also being one of the government entities mandated under the government to provide quality education and transforming lives, on behalf of the government, we are highly committed to fighting any form of corruption in our organization to ensure that all the monies that the government entrust with us, is optimally and prudently utilized for the benefits of all the people we serve.

**The following is a requirement that every Bidder wishing to do business with JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY must comply with:**

- (1) Each bidder must submit a statement, as part of the tender documents, in the format given and which must be signed personally by the Chief Executive Officer or other appropriate senior corporate officer of the bidding company and, where relevant, of its subsidiary in Kenya. If a tender is submitted by a subsidiary, a statement to this effect will also be required of the parent company, signed by its Chief Executive Officer or other appropriate senior corporate officer.
- (2) Bidders will also be required to submit similar No-bribery commitments from their subcontractors and consortium partners; the bidder may cover the subcontractors and consortium partners in its own statement, provided the bidder assumes full responsibility.
- (3)
  - a) Payment to agents and other third parties shall be limited to appropriate compensation for legitimate services.
  - b) Each bidder will make full disclosure in the tender documentation of the beneficiaries and amounts of all payments made, or intended to be made, to agents or other third parties (including political parties or electoral candidates) relating to the tender and, if successful, the implementation of the contract.
  - c) The successful bidder will also make full disclosure [quarterly or semi- annually] of all payments to agents and other third parties during the execution of the contract.
  - d) Within six months of the completion of the performance of the contract, the successful bidder will formally certify that no bribes or other illicit commissions have been paid. The final accounting shall include brief details of the goods and services provided that are sufficient to establish the legitimacy of the payments made.
  - e) Statements required according to subparagraphs (b) and (d) of this paragraph will have to be certified by the company's Chief Executive Officer, or other appropriate senior corporate officer.

- (4) Tenders which do not conform to these requirements shall not be considered.
- (5) If the successful bidder fails to comply with its No-bribery commitment, significant sanctions will apply. The sanctions may include all or any of the following:
  - a) Cancellation of the contract;
  - b) Liability for damages to the public authority and/or the unsuccessful competitors in the bidding possibly in the form of a lump sum representing a pre-set percentage of the contract value (liquidated).
- (6) Bidders shall make available, as part of their tender, copies of their anti-Bribery Policy/Code of Conduct, if any, and of their-general or project - specific - Compliance Program.
- (7) The Government of Kenya through Ethics and Anti-Corruption Commission has made special arrangements for adequate oversight of the procurement process and the execution of the contract. Those charged with the oversight responsibility will have full access if need be to all documentation submitted by Bidders for this contract, and to which in turn all Bidders and other parties involved or affected by the project shall have full access (provided, however, that no proprietary information concerning a bidder may be disclosed to another bidder or to the public).

## 1. MEMORANDUM ( FORMAT )

### (Clause 46 of Kenya Public Procurement and Asset Disposal Act 2015)

This company \_\_\_\_\_(*name of company*) has issued, for the purposes of this tender, a Compliance Program copy attached -which includes all reasonable steps necessary to assure that the No-bribery commitment given in this statement will be complied with by its managers and employees, as well as by all third parties working with this company on the public sector projects or contract including agents, consultants, consortium partners, subcontractors and suppliers)"

Authorized Signature: \_\_\_\_\_

Name and Title of Signatory: \_\_\_\_\_

Name of Bidder: \_\_\_\_\_

Address: \_\_\_\_\_

### NON-DEBARMENT STATEMENT

I/We/Messrs..... of

.....Street/avenue, .....Building, P. O. Box.....Code ....., of ..... (Town),

..... (Nationality), Phone: ..... E-mail .....

declare that I/We /Messrs .....



are not debarred from participating in public procurement by the Public Procurement Oversight Authority pursuant to section 115 of the Public Procurement and Disposal Act, 2005.

Dated this .....day of ..... 20.....

Authorized Signature.....Official Stamp .....

Name and Title of Signatory.....

## STATEMENT OF COMPLIANCE

- a) I confirm compliance of all clauses of the General Conditions, General Specifications and Particular Specifications in this tender.
- b) I confirm I have not made and will not make any payment to any person, who can be perceived as an inducement to win this tender.

Signed: .....for and on behalf of the Tenderer

Date: .....

Official Rubber Stamp: .....

**DETAILS OF LITIGATIONS OR ARBITRATION PROCEEDINGS  
IN WHICH THE TENDERER IS INVOLVED AS ONE OF THE PARTIES**

1. \_\_\_\_\_.
2. \_\_\_\_\_.
3. \_\_\_\_\_.
4. \_\_\_\_\_.
5. \_\_\_\_\_.
6. \_\_\_\_\_.
7. \_\_\_\_\_.
8. \_\_\_\_\_.
9. \_\_\_\_\_.
10. \_\_\_\_\_.