



REPUBLIC OF KENYA

DEPARTMENT OF ROADS, TRANSPORT AND PUBLIC WORKS

PROPOSED CONSTRUCTION AND COMPLETION OF SCHOOL OF HUMANITIES COMPLEX BLOCK PHASE-1-PWANI UNIVERSITY:

W.P. ITEM No.

TENDER NO.

TENDER SPECIFICATIONS AND BILLS OF QUANTITIES

FOR

SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF INTERNAL PLUMBING, SANITARY FITTINGS, DRAINAGE, AIR CONDITIONING, ROOF TOP WATER TANKS, BOOSTER PUMPS, WATER RETICULATION AND FIRE FIGHTING EQUIPMENT INSTALLATIONS.
(SUB-CONTRACT)

CLIENT
THE COUNTY GOVERNMENT OF KILIFI
P.O. BOX 519
KILIFI

MECHANICAL ENGINEER
SENIOR SUPERINTENDENT MMECHANICAL
P.O. BOX 409
KILIFI

ARCHITECT
COUNTY ARCHITECT
P.O. BOX 409
KILIFI

QUANTITY SURVEYOR
COUNTY QUANTITY SURVEYOR
P.O. BOX 409
KILIFI

STRUCTURAL ENGINEER
COUNTY STRUCTURAL ENGINEER
P.O. BOX 409
KILIFI

Closing Date 29th January, 2019

JANUARY - 2019

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DEFINITIONS

The following terms and expressions used in the contract document shall have the following meanings:

The Employer: The Republic of Kenya,
Represented by: **The Vice Chancellor,**
Pwani University
:
P.O. Box 195, KILIFI

Architect: County Architect,
Department of Public Works,
P.O. Box 409,
KILIFI

Engineer: Senior Superintendent Mechanical (BS),
Department of Public Works,
P.O. Box 409,
KILIFI

Quantity Surveyor: County Quantity Surveyor,
Department of Public Works,
P.O. Box 409,
KILIFI

Structural Engineer: County Structural Engineer,
Department of Public Works,
P.O. Box 409,
KILIFI

Employer's representative: This shall mean the Vice Chancellor
The Vice Chancellor,
Pwani University,
P.O. Box 195,
KILIFI

Main contractor The firm appointed to carry out **Builders and civil Works**

Contractor The firm appointed to carry out
SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF INTERNAL PLUMBING,
SANITARY FITTINGS, DRAINAGE, AIR CONDITIONING, ROOF TOP WATER TANKS, BOOSTER
PUMPS, WATER RETICULATION AND FIRE FIGHTING EQUIPMENT INSTALLATIONS.

(SUB-CONTRACT)

(ii)

SPECIAL NOTES

1. These notes shall form part of the Instructions to Tenderers and Conditions of Contract.
2. The tenderer is required to check the number of pages in this document and should he find any missing, or in duplicate, or indistinct he should inform the Chief Electrical and Mechanical Engineer (BS), Ministry of Roads and Public Works.
3. Should the tenderer be in any doubt about the precise meaning of any item or figure, for any reason whatsoever, he must inform the Chief Electrical and Mechanical Engineer (BS), Ministry of Roads and Public Works, in order that the correct meaning may be decided before the date of submission of tender.
4. No liability will be admitted nor claim allowed, in respect of errors in the tender due to mistakes in the specification, which should have been rectified in the manner, described above.
5. All tenderers must make a declaration that they have not and will not make any payment to any person which can be perceived as an inducement to enable them to win this tender.
6. Any tenderer whose firm uses the titles “Engineer” and “Engineers” must produce evidence of registration of at least one of the directors by the Engineers Registration Board of Kenya to avoid disqualification.

FORM OF TENDER

To: The Vice Chancellor,
Pwani University,
P.O. BOX 195,
KILIFI

Dear Sir,

**SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING
OF INTERNAL PLUMBING, SANITARY FITTINGS, DRAINAGE, AIR
CONDITIONING, ROOF TOP WATER TANKS, BOOSTER PUMPS, WATER
RETICULATION AND FIRE FIGHTING EQUIPMENT INSTALLATIONS.
(SUB-CONTRACT)**

Kshs..... *[Amount in figures]*

Kenya Shillings.....

..... *[Amount in words]*

1. We undertake, if our tender is accepted, to commence the Works as soon as is reasonably possible after the receipt of the Employer’s Representative’s notice to commence, and to complete the whole of the Works comprised in the Contract within the time stated in the Appendix to Conditions of Contract.
2. We agree to abide by this tender for a **period of 120 days from the date of tender opening** and shall remain binding upon us and may be accepted at any time before that date.
3. 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.
4. Understand that you are not bound to accept the lowest or any tender you may receive.

Dated this Day of 20.....

Signaturein the capacity of

Duly authorized to sign tenders for and on behalf of:

..... *[Name of Tenderer]*

Of..... *[Address of Tenderer]*

PIN No.

VAT CERTIFICATE No.

Witness: Name
Address
Signature

FORM OF TENDER SECURITY

WHEREAS (Hereinafter called “the Tenderer”) has submitted his tender dated For **SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF INTERNAL PLUMBING, SANITARY FITTINGS, DRAINAGE, AIR CONDITIONING, ROOF TOP WATER TANKS, BOOSTER PUMPS, WATER RETICULATION AND FIRE FIGHTING EQUIPMENT INSTALLATIONS. (SUB-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 his 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)

[v]

(Seal)

SECTION A:
INSTRUCTIONS TO TENDERERS.

INSTRUCTIONS TO TENDERERS

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INSTRUCTION TO TENDERERS

Note: The tenderer must comply with the following conditions and instructions and failure to do so is liable to result in rejection of the tender.

GENERAL

1. Definitions

- (a) **“Tenderer”** means any person or persons partnership firm or company submitting a sum or sums in the Bills of Quantities in accordance with the Instructions to Tenderers, Conditions of Contract Parts I and II, Specifications, Drawings and Bills of Quantities for the work contemplated, acting directly or through a legally appointed representative.
- (b) **“Approved tenderer”** means the tenderer who is approved by the Employer.
- (c) Any noun or adjective derived from the word **“tender”** shall be read and construed to mean the corresponding form of the noun or adjective **“bid”**. Any conjugation of the verb “tender” shall be read and construed to mean the corresponding form of the verb “bid.”
- (d) **“Employer”** means a Central Government Ministry, Local Authority, State Corporation or any other Public Institution.

2. Eligibility and Qualification Requirements

- 2.1 This invitation to tender is open to all tenderers who have been prequalified.
- 2.2 To be eligible for award of Contract, the tenderer shall provide evidence satisfactory to the Employer of their eligibility under Sub clause 2.1 above and of their capability and adequacy of resources to effectively carry out the subject Contract. To this end, the tenderer shall be required to update the following information already submitted during prequalification:-
 - (a) Details of experience and past performance of the tenderer on the works of a similar nature within the past five years and details of current work on hand and other contractual commitments.
 - (b) The qualifications and experience of key personnel proposed for administration and execution of the contract, both on and off site.

Major items of construction plant and equipment proposed for use in carrying out the Contract. Only reliable plant in good working order and suitable for the work required of it shall be shown on this schedule. The tenderer will also indicate on this schedule when each item will be available on the Works. Included also should be a schedule of plant, equipment and material to be imported for the purpose of the Contract, giving details of make, type, origin and CIF value as appropriate.

- (c) Details of subcontractors to whom it is proposed to sublet any portion of the Contract and for whom authority will be requested for such subletting in accordance with clause 4 of the Conditions of Contract.
- (d) A draft Program of Works in the form of a bar chart and Schedule of Payment which shall form part of the Contract if the tender is accepted. Any change in the Program or Schedule shall be subjected to the approval of the Engineer.
- (e) Details of any current litigation or arbitration proceedings in which the Tenderer is involved as one of the parties.

2.3 Joint Ventures

Tenders submitted by a joint venture of two or more firms as partners shall comply with the following requirements:-

- (a) The tender, and in case of a successful tender, the Form of Agreement, shall be signed so as to be legally binding on all partners.
- (b) One of the partners shall be nominated as being in charge; and this authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the partners.
- (c) The partner in charge shall be authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the joint venture and the entire execution of the Contract including payment shall be done exclusively with the partner in charge.
- (d) All partners of the joint venture shall be liable jointly and severally for the execution of the Contract in accordance with the Contract terms, and a relevant statement to this effect shall be included in the authorization mentioned under (b) above as well as in the Form of Tender and the Form of Agreement (in case of a successful tender).
- (e) A copy of the agreement entered into by the joint venture partners shall be submitted with the tender.

3. Cost of Tendering

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, regardless of the conduct or outcome of the tendering process.

4. Site Visit

4.1 The tenderer is advised to visit and examine the Site and its surroundings and obtain for himself on his own responsibility, all information that may be necessary for preparing the tender and entering into a contract. The costs of visiting the Site shall be the tenderer's own responsibility.

4.2 The tenderer and any of his personnel or agents will be granted permission by the Employer to enter upon premises and lands for the purpose of such inspection, but only upon the express condition that the tenderer, his personnel or agents, will release and indemnify the Employer from and against all liability in respect of, and will be responsible for personal injury (whether fatal or otherwise), loss of or damage to property and any other loss, damage, costs and expenses however caused, which but for the exercise of such permission, would not have arisen.

4.3 The Employer shall organize a site visit at a date to be notified. A representative of the Employer will be available to meet the intending tenderers at the Site.

Tenderers must provide their own transport. The representative will not be available at any other time for site inspection visits.

Each tenderer shall complete the Certificate of Tenderer's Visit to the Site, whether he in fact visits the Site at the time of the organized site visit or by himself at some other time.

TENDER DOCUMENTS

5. Tender Documents

5.1 The Tender documents comprise the documents listed herebelow and should be read together with any Addenda issued in accordance with Clause 7 of these instructions to tenderers.

- a. Form of Invitation for Tenders
- b. Instructions to Tenderers

- c. Form of Tender
- d. Appendix to Form of Tender
- e. Form of Tender Surety
- f. Statement of Foreign Currency Requirements
- g. Form of Performance Security
- h. Form of Agreement
- i. Form of Advance payment Bank Guarantee
- j. Schedules of Supplementary Information
- k. General Conditions of Contract – Part I
- l. Conditions of Particular Application – Part II
- m. Specifications
- n. Bills of Quantities
- o. Drawings

5.2 The tenderer is expected to examine carefully all instructions, conditions, forms, terms, specifications and drawings in the tender documents. Failure to comply with the requirements for tender submission will be at the tenderer's own risk. Pursuant to clause 22 of Instructions to Tenderers, tenders which are not substantially responsive to the requirements of the tender documents will be rejected.

5.3 All recipients of the documents for the proposed Contract for the purpose of submitting a tender (whether they submit a tender or not) shall treat the details of the documents as "private and confidential".

6. Clarification of Tender Documents

6.1 A prospective tenderer requiring any clarification of the tender documents may notify the Employer in writing or by telex, cable or facsimile at the Employer's mailing address indicated in the Invitation to Tender. The Employer will respond in writing to any request for clarification which he receives earlier than 28 days prior to the deadline for the submission of tenders. Written copies of the Employer's response (including the query but without identifying the source of the inquiry) will be sent to all prospective tenderers who have purchased the tender documents.

7. Amendment of Tender Documents

7.1 At any time prior to the deadline for submission of tenders the Employer may, for any reason, whether at his own initiative or in response to a clarification requested by a prospective tenderer, modify the tender documents by issuing Addenda.

- 7.2 Any Addendum will be notified in writing or by cable, telex or facsimile to all prospective tenderers who have purchased the tender documents and will be binding upon them.
- 7.3 If during the period of tendering, any circular letters (tender notices) shall be issued to tenderers by, or on behalf of, the Employer setting forth the interpretation to be placed on a part of the tender documents or to make any change in them, such circular letters will form part of the tender documents and it will be assumed that the tenderer has taken account of them in preparing his tender. The tenderer must promptly acknowledge any circular letters he may receive.
- 7.4 In order to allow prospective tenderers reasonable time in which to take the Addendum into account in preparing their tenders, the Employer may, at his discretion, extend the deadline for the submission of tenders.

PREPARATION OF TENDERS

8. Language of Tender

- 8.1 The tender and all correspondence and documents relating to the tender exchanged between the tenderer and the Employer shall be written in the English language. Supporting documents and printed literature furnished by the tenderer with the tender may be in another language provided they are accompanied by an appropriate translation of pertinent passages in the above stated language. For the purpose of interpretation of the tender, the English language shall prevail.

9. Documents Comprising the Tender

- 9.1 The tender to be prepared by the tenderer shall comprise: the Form of Tender and Appendix thereto, a Tender Surety, the Priced Bills of Quantities and Schedules, the information on eligibility and qualification, and any other materials required to be completed and submitted in accordance with the Instructions to Tenderers embodied in these tender documents. The Forms, Bills of Quantities and Schedules provided in the tender documents shall be used without exception (subject to extensions of the schedules in the same format and to the provisions of clause 13.2 regarding the alternative forms of Tender Surety].

10. Tender Prices

- 10.1 All the insertions made by the tenderer shall be made in INK and the tenderer shall clearly form the figures. The relevant space in the Form of Tender and Bills of Quantities shall be completed accordingly

without interlineations or erasures except those necessary to correct errors made by the tenderer in which case the erasures and interlineations shall be initialed by the person or persons signing the tender.

- 10.2 A price or rate shall be inserted by the tenderer for every item in the Bills of Quantities whether the quantities are stated or not items against which no rate or price is entered by the tenderer will not be paid for by the Employer when executed and shall be deemed covered by the rates for other items and prices in the Bills of Quantities.

The prices and unit rates in the Bills of Quantities are to be the full [all-inclusive] value of the work described under the items, including all costs and expenses which may be necessary and all general risks, liabilities and obligations set forth or implied in the documents on which the tender is based. All duties and taxes and other levies payable by the Contractor under the Contract or for any other cause as of the date 28 days prior to the deadline for the submission of tenders, shall be included in the rates and prices and the total tender prices submitted by the Tenderer.

Each price or unit rate inserted in the Bills of Quantities should be a realistic estimate for completing the activity or activities described under that particular item and the tenderer is advised against inserting a price or rate against any item contrary to this instruction.

Every rate entered in the Bills of Quantities, whether or not such rate be associated with a quantity, shall form part of the Contract. The Employer shall have the right to call for any item of work contained in the Bills of Quantities, and such items of work to be paid for at the rate entered by the tenderer and it is the intention of the Employer to take full advantage of unbalanced low rates.

- 10.3 Unless otherwise specified the tenderer must enter the amounts representing 10% of the sub-total of the summary of the Bills of Quantities for Contingencies and Variation of Prices [V.O.P.] payments in the summary sheet and add them to the sub-total to arrive at the tender amount.
- 10.4 The tenderer shall furnish with his tender written confirmation from his suppliers or manufacturers of unit rates for the supply of items listed in the Conditions of Contract clause 47 where appropriate.
- 10.5 The rates and prices quoted by the tenderer are subject to adjustment during the performance of the Contract only in accordance with the provisions of the Conditions of Contract. The tenderer shall complete the schedule of basic rates and shall submit with his tender such other supporting information as required under clause 47 of the Conditions of Contract Part II.

11. Currencies of Tender and Payment

- 11.1 Tenders shall be priced in Kenya Shillings and the tender sum shall be in Kenya Shillings.
- 11.2 Tenderers are required to indicate in the Statement of Foreign Currency Requirements, which forms part of the tender, the foreign currency required by them. Such currency should generally be the currency of the country of the tenderer's main office. However, if a substantial portion of the tenderer's expenditure under the Contract is expected to be in countries other than his country of origin, then he may state a corresponding portion of the contract price in the currency of those other countries. However, the foreign currency element is to be limited to two (2) different currencies and a maximum of 30% (thirty percent) of the Contract Price.
- 11.3 The rate of rates of exchange used for pricing the tender shall be selling rate or rates of the Central Bank ruling on the date thirty (30) days before the final date for the submission of tenders.
- 11.4 Tenderers must enclose with their tenders, a brief justification of the foreign currency requirements stated in their tenders.

12. Tender Validity

- 12.1 The tender shall remain valid and open for acceptance for a period of one hundred and twenty (120) days from the specified date of tender opening or from the extended date of tender opening (in accordance with clause 7.4 here above) whichever is the later.
- 12.2 In exceptional circumstances prior to expiry of the original tender validity period, the Employer may request the tenderer for a specified extension of the period of validity. The request and the responses thereto shall be made in writing or by cable, telex or facsimile. A tenderer may refuse the request without forfeiting his Tender Surety. A tenderer agreeing to the request will not be required nor permitted to modify his tender, but will be required to extend the validity of his Tender Surety correspondingly.

13. Tender Surety

- 13.1 The tenderer shall furnish as part of his tender, a Tender Surety in the amount stated in the Appendix to Instructions to Tenderers.
- 13.2 The unconditional Tender Surety shall be in Kenya Shillings and be in form of a certified cheque, a bank draft, an irrevocable letter of credit or a guarantee from a reputable Bank approved by the Employer located in the Republic of Kenya.

The format of the Surety shall be in accordance with the sample form of Tender Surety included in these tender documents; other formats may be permitted subject to the prior approval of the Employer. The Tender Surety shall be valid for twenty eight (28) days beyond the tender validity period.

- 13.3 Any tender not accompanied by an acceptable Tender Surety will be rejected by the Employer as non-responsive.
- 13.4 The Tender Sureties of unsuccessful tenderers will be returned as promptly as possible but not later than twenty eight (28) days after concluding the Contract execution and after a Performance Security has been furnished by the successful tenderer. The Tender Surety of the successful tenderer will be returned upon the tenderer executing the Contract and furnishing the required Performance Security.
- 13.5 The Tender Surety may be forfeited:
- (a) if a tenderer withdraws his tender during the period of tender validity: or
 - (b) in the case of a successful tenderer, if he fails
 - (i) to sign the Agreement, or
 - (ii) to furnish the necessary Performance Security
 - (c) if a tenderer does not accept the correction of his tender price pursuant to clause 23.

14. No Alternative Offers

- 14.1 The tenderer shall submit an offer which complies fully with the requirements of the tender documents.

Only one tender may be submitted by each tenderer either by himself or as partner in a joint venture.

- 14.2 The tenderer shall not attach any conditions of his own to his tender. The tender price must be based on the tender documents. The tenderer is not required to present alternative construction options and he shall use without exception, the Bills of Quantities as provided, with the amendments as notified in tender notices, if any, for the calculation of his tender price.

Any tenderer who fails to comply with this clause will be disqualified.

15. Pre-Tender Meeting

- 15.1 The tenderer's designated representative is invited to attend a pre-

tender meeting, which if convened, will take place at the venue and time stated in the Invitation to Tender. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

- 15.2 The tenderer is requested as far as possible to submit any questions in writing or by cable, to reach the Employer not later than seven days before the meeting. It may not be practicable at the meeting to answer questions received late, but questions and responses will be transmitted in accordance with the following:
- (a) Minutes of the meeting, including the text of the questions raised and the responses given together with any responses prepared after the meeting will be transmitted without delay to all purchasers of the tender documents. Any modification of the tender documents listed in --Clause 9 which may become necessary as a result of the pre-tender meeting shall be made by the Employer exclusively through the issue of a tender notice pursuant to Clause 7 and not through the minutes of the pre-tender meeting.
 - (b) Non-attendance at the pre-tender meeting will not be cause for disqualification of a bidder.

16. Format and Signing of Tenders

- 16.1 The tenderer shall prepare his tender as outlined in clause 9 above and mark appropriately one set "ORIGINAL" and the other "COPY".
- 16.2 The copy of the tender and Bills of Quantities shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the tenderer. Proof of authorization shall be furnished in the form of the written power of attorney which shall accompany the tender. All pages of the tender where amendments have been made shall be initialed by the person or persons signing the tender.
- 16.3 The complete tender shall be without alterations, interlineations or erasures, except as necessary to correct errors made by the tenderer, in which case such corrections shall be initialed by the person or persons signing the tender.

SUBMISSION OF TENDERS

17. Sealing and Marking of Tenders

- 17.1 The tenderer shall seal the original and copy of the tender in separated envelopes, duly marking the envelopes as "ORIGINAL" and "COPY". The envelopes shall then be sealed in an outer envelope.

- 17.2 The inner and outer envelopes shall be addressed to the Employer at the address stated in the Appendix to Instructions to Tenderers and bear the name and identification of the Contract stated in the said Appendix with a warning not to open before the date and time for opening of tenders stated in the said Appendix.
- 17.3 The inner envelopes shall each indicated the name and address of the tenderer to enable the tender to be returned unopened in case it is declared “late”, while the outer envelope shall bear no mark indicating the identity of the tenderer.
- 17.4 If the outer envelope is not sealed and marked as instructed above, the Employer will assume no responsibility for the misplacement or premature opening of the tender. A tender opened prematurely for this cause will be rejected by the Employer and returned to the tenderer.

18 Deadline for Submission of Tenders

- 18.1 Tenders must be received by the Employer at the address specified in clause 17.2 and on the date and time specified in the Letter of Invitation, subject to the provisions of clause 7.4, 18.2 and 18.3.

Tenders delivered by hand must be placed in the “tender box” provided in the office of the Employer.

Proof of posting will not be accepted as proof of delivery and any tender delivered after the above stipulated time, from whatever cause arising will not be considered.

- 18.2 The Employer may, at his discretion, extend the deadline for the submission of tenders through the issue of an Addendum in accordance with clause 7, in which case all rights and obligations of the Employer and the tenderers previously subject to the original deadline shall thereafter be subject to the new deadline as extended.
- 18.3 Any tender received by the Employer after the prescribed deadline for submission of tender will be returned unopened to the tenderer.

19 Modification and Withdrawal of Tenders

- 19.1 The tenderer may modify or withdraw his tender after tender submission, provided that written notice of the modification or withdrawal is received by the Employer prior to prescribed deadline for submission of tenders.
- 19.2 The tenderer’s modification or withdrawal notice shall be prepared, sealed, marked and dispatched in accordance with the provisions for

the submission of tenders, with the inner and outer envelopes additionally marked “MODIFICATION” or “WITHDRAWAL” as appropriate.

- 19.3 No tender may be modified subsequent to the deadline for submission of tenders.
- 19.4 No tender may be withdrawn in the interval between the deadline for submission of tenders and the period of tender validity specified on the tender form. Withdrawal of a tender during this interval will result in the forfeiture of the Tender Surety.
- 19.5 Subsequent to the expiration of the period of tender validity prescribed by the Employer, and the tenderer having not been notified by the Employer of the award of the Contract or the tenderer does not intend to conform with the request of the Employer to extend the prior of tender validity, the tenderer may withdraw his tender without risk of forfeiture of the Tender Surety.

TENDER OPENING AND EVALUATION

20 Tender Opening

- 20.1 The Employer will open the tenders in the presence of the tenderers’ representatives who choose to attend at the time and location indicated in the Letter of Invitation to Tender. The tenderers’ representatives who are present shall sign a register evidencing their attendance.
- 20.2 Tenders for which an acceptable notice of withdrawal has been submitted, pursuant to clause 19, will not be opened. The Employer will examine the tenders to determine whether they are complete, whether the requisite Tender Sureties have been furnished, whether the documents have been properly signed and whether the tenders are generally in order.
- 20.3 At the tender opening, the Employer will announce the tenderer’s names, total tender price, tender price modifications and tender withdrawals, if any, the presence of the requisite Tender Surety and such other details as the Employer, at his discretion, may consider appropriate. No tender shall be rejected at the tender opening except for late tenders.
- 20.4 The Employer shall prepare minutes of the tender opening including the information disclosed to those present.
- 20.5 Tenders not opened and read out a tender opening shall not be considered further for evaluation, irrespective of the circumstances.

21 Process to be Confidential

- 21.1 After the public opening of tenders, information relating to the examination, clarification, evaluation and comparisons of tenders and recommendations concerning the award of Contract shall not be disclosed to tenderers or other persons not officially concerned with such process until the award of Contract is announced.
- 21.2 Any effort by a tenderer to influence the Employer in the process of examination, evaluation and comparison of tenders and decisions concerning award of Contract may result in the rejection of the tenderer's tender.

22 Clarification of Tenders

- 22.1 To assist in the examination, evaluation and comparison of tenders, the Employer may ask tenderers individually for clarification of their tenders, including breakdown of unit prices. The request for clarification and the response shall be in writing or by cable, facsimile or telex, 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 arithmetical errors discovered by the employer during the evaluation of the tenders in accordance with clause 24.
- 22.2 No Tenderer shall contact the Employer on any matter relating to his tender from the time of the tender opening to the time the Contract is awarded. If the tenderer wishes to bring additional information to the notice of the Employer, he shall do so in writing.

23 Determination of Responsiveness

- 23.1 Prior to the detailed evaluation of tenders, the Employer will determine whether each tender is substantially responsive to the requirements of the tender documents.
- 23.2 For the purpose of this clause, a substantially responsive tender is one which conforms to all the terms, conditions and specifications of the tender documents without material deviation or reservation and has a valid bank guarantee. A material deviation or reservation is one which affects in any substantial way the scope, quality, completion timing or administration of the Works to be undertaken by the tenderer under the Contract, or which limits in any substantial way, inconsistent with the tender documents, the Employer's rights or the tenderers obligations under the Contract and the rectification of which would affect unfairly the competitive position of other tenderers who have presented substantially responsive tenders.
- 23.3 Each price or unit rate inserted in the Bills of Quantities shall be a realistic estimate of the cost of completing the works described under the particular item including allowance for overheads, profits and the like. Should a tender be seriously unbalanced in relation to the Employer's estimate of the works to be performed under any item or groups of items, the tender shall be deemed not responsive.

- 23.4 A tender determined to be not substantially responsive will be rejected by the Employer and may not subsequently be made responsive by the tenderer by correction of the non-conforming deviation or reservation.

24 Correction of Errors

Tenders determined to be substantially responsive shall be checked by the Employer for any arithmetic errors in the computations and summations. Errors will be corrected by the Employer as follows:

- (a) Where there is a discrepancy between the amount in figures and the amount in words, the amount in words will govern.
- (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 adjustment will be made to the entry containing that error.
- (c) 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 tenderer, 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 13.

25 Conversion to Single Currency

- 25.1 For compensation of tenders, the tender price shall first be broken down into the respective amounts payable in various currencies by using the selling rate or rates of the Central Bank of Kenya ruling on the date twenty eight (28) days before the final date for the submission of tenders.
- 25.2 The Employer will convert the amounts in various currencies in which the tender is payable (excluding provisional sums but including Day works where priced competitively) to Kenya Shillings at the selling rates stated in clause 25.1.

26 Evaluation and Comparison of Tenders

- 26.1 The Employer will evaluate only tenders determined to be substantially responsive to the requirements of the tender documents in accordance with clause 23.
- 26.2 In evaluating 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 24.
 - (b) Excluding Provisional Sums and provision, if any, for Contingencies in the Bills of Quantities, but including Day works where priced competitively.
- 26.3 The Employer reserves the right to accept any variation, deviation or alternative offer. Variations, deviations, alternative offers and other factors which are in excess of the requirements of the tender documents or otherwise result in the accrual of unsolicited benefits to the Employer, shall not be taken into account in tender evaluation.
- 26.4 Price adjustment provisions in the Conditions of Contract applied over the period of execution of the Contract shall not be taken into account in tender evaluation.
- 26.5 If the lowest evaluated tender is seriously unbalanced or front loaded in relation to the Employer's estimate of the items of work to be performed under the Contract, the Employer may require the tenderer to produce detailed price analyses for any or all items of the Bills of Quantities, to demonstrate the relationship between those prices, proposed construction methods and schedules. After evaluation of the price analyses, the Employer may require that the amount of the Performance Security set forth in clause 29 be increased at the expense of the successful tenderer to a level sufficient to protect the Employer against financial loss in the event of subsequent default of the successful tenderer under the Contract.
- 26.6 Firms incorporated in Kenya where indigenous Kenyans own 51% or more of the share capital shall be allowed a 10% preferential bias provided that they do not sub-contract work valued at more than 50% of the Contract Price excluding Provisional Sums to a non-indigenous sub-contractor.

AWARD OF CONTRACT

27 Award

- 27.1 Subject to clause 27.2, the Employer will award the Contract to the tenderer whose tender is determined to be substantially responsive to the tender documents and who has offered the lowest evaluated tender price subject to possessing the capability and resources to effectively carry out the Contract Works.
- 27.2 The Employer reserves the right to accept or reject any tender, and to annul the tendering process and reject all tenders, at any time prior to award of Contract, without thereby incurring any liability to the affected tenderers or any obligation to inform the affected tenderers of the grounds for the Employer's action.

28 Notification of Award

- 28.1 Prior to the expiration of the period of tender validity prescribed by the Employer, the Employer will notify the successful tenderer by cable, telefax or telex and confirmed in writing by registered letter that his tender has been accepted. This letter (hereinafter and in all Contract documents called “Letter of Acceptance”) shall name the sum (hereinafter and in all Contract documents called “the Contract Price”) which the Employer will pay to the Contractor in consideration of the execution and completion of the Works as prescribed by the Contract.
- 28.2 Notification of award will constitute the formation of the Contract.
- 28.3 Upon the furnishing of a Performance Security by the successful tenderer, the unsuccessful tenderers will promptly be notified that their tenders have been unsuccessful.
- 28.4 Within twenty eight [28] days of receipt of the form of Contract Agreement from the Employer, the successful tenderer shall sign the form and return it to the Employer together with the required Performance Security.

29 Performance Guarantee

- 29.1 Within twenty eight [28] days of receipt of the notification of award from the Employer, the successful tenderer shall furnish the Employer with a Performance Security in an amount stated in the Appendix to Instructions to Tenderers.
- 29.2 The Performance Security to be provided by the successful tenderer shall be an unconditional Bank Guarantee issued at the tenderer’s option by an established and a reputable Bank approved by the Employer and located in the Republic of Kenya and shall be divided into two elements namely, a performance security payable in foreign currencies (based upon the exchange rates determined in accordance with clause 35.4 of the Conditions of Contract) and a performance security payable in Kenya Shillings. The value of the two securities shall be in the same proportions of foreign and local currencies as requested in the form of foreign currency requirements.
- 29.3 Failure of the successful tenderer to lodge the required Performance Security shall constitute a breach of Contract and sufficient grounds for the annulment of the award and forfeiture of the Tender Security and any other remedy under the Contract the Employer may award the Contract to the next ranked tenderer.

APPENDIX TO INSTRUCTIONS TO TENDERERS

1. CLAUSE 2.1

Change to read "This tender is open to all eligible tenderers "

2. OMIT

Clauses 4.3, 5.1 (a), (d), (f), (j), 10.3, 10.4, 11.2, 11.4,15, 25, 26.6,30

3. MODIFY CLAUSE 5.1(h)

Form of agreement shall be as the Kenya Association of Building and Civil Engineering Contractors (KABCEC)

4. ADD TO CLAUSE 13.1

Amount of tender surety shall be **Kshs**.....

5. ADD TO CLAUSE 13.2

The tender surety can also be an insurance bond from an insurance company in the current list of authorised insurance companies' issued by the Public Procurement Oversight Authority (PPOA).Tender surety shall be valid for 150 days from the date of tender opening; the tender surety expiry date and the tender opening date all being inclusive.

6. MODIFY CLAUSE 16.1 AND 17.

Only original tender document shall be submitted.

7. MODIFY CLAUSE 17.2

The name and address of the Employer's representative for the purpose of submission of tenders shall be as per the tender invitation notice.

8. ADD TO CLAUSE 20

The tender opening date and time is as stated in the tender invitation notice.

9. MODIFY CLAUSE 28.4

Replace "twenty eight (28)" with twenty one (21)

10. MODIFY CLAUSE 29.1

Replace "twenty eight (28) with twenty one (21). Amount of performance security shall be five per cent (5%).

11. ADD TO CLAUSE 29.2

Performance security shall not be divided in two elements and shall be payable in Kenya Shillings Only.

12. ADD TO CLAUSE 24

- a) 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 Bills of Quantities, the amount as stated in the Form of Tender shall prevail
- b) The Error correction factor shall be computed by expressing the difference between the amount and the corrected tender sum as a percentage of the corrected contract works (i.e. corrected tender sum less P.C; and Provisional Sums)
- c) The Error correction factor shall be applied to all contract works (as a rebate or addition as the case may be) for the purposes of valuations for Interim Certificates and valuation of variations.

13. MODIFY CLAUSE 10.5

Clause 47 is not part of the Conditions of Contract Part II

14. ADD TO CLAUSE 26

The evaluation criteria in pages A-13 to A-20 shall form part of the evaluation.

SECTION B

PART I

CONDITIONS OF CONTRACT

SECTION B:

CONDITIONS OF CONTRACT (MAIN WORKS)

CONDITIONS OF CONTRACT (MAIN WORKS)

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CONDITIONS OF CONTRACT (MAIN WORKS)

1. Definitions

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

“Bills of Quantities” means the priced and completed Bill of Quantities forming part of the tender [where applicable].

“Schedule of Rates” means the priced Schedule of Rates forming part of the tender [where applicable].

“The Completion Date” means the date of completion of the Works as certified by the Employer’s Representative.

“The Contract” means the agreement entered into by the Employer and the Contractor as recorded in the Agreement Form and signed by the parties.

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

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

“The Contract Price” is the price stated in the Letter of Acceptance.

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

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

“The Defects Liability Certificate” is the certificate issued by Employer’s Representative upon correction of defects by the Contractor.

“The Defects Liability Period” is the period named in the Appendix to Conditions of Contract and calculated from the Completion Date.

“Drawings” include calculations and other information provided or approved by the Employer’s Representative for the execution of the Contract.

“Employer” includes Central or Local Government administration, Universities, Public Institutions and Corporations and is the party who employs the Contractor to carry out the Works.

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

“Site” means the place or places where the permanent Works are to be carried out including workshops where the same is being prepared.

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

“Employer’s Representative” is the person appointed by the Employer and notified to the Contractor for the purpose of supervision of the Works.

“Specification” means the Specification of the Works included in the Contract.

“Start Date” is the date when the Contractor shall commence execution of the Works.

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

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

“A Variation” is an instruction given by the Employer’s Representative which varies the Works.

“The Works” are what the Contract requires the Contractor to construct, install, and turnover to the Employer.

2. Contract Documents

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

- (1) Agreement,
- (2) Letter of Acceptance,
- (3) Contractor’s Tender,
- (4) Conditions of Contract,
- (5) Specifications,
- (6) Drawings,
- (7) Bills of Quantities or Schedule of Rates [whichever is applicable)

3. Employer's Representative's Decisions

- 3.1 Except where otherwise specifically stated, the Employer's Representative will decide contractual matters between the Employer and the Contractor in the role representing the Employer.

4. Works, Language and Law of Contract

- 4.1 The Contractor shall construct and install the Works in accordance with the Contract documents. The Works may commence on the Start Date and shall be carried out in accordance with the Programme submitted by the Contractor, as updated with the approval of the Employer's Representative, and complete them by the Intended Completion Date.
- 4.2 The ruling language of the Contract shall be English language and the law governing the Contract shall be the law of the Republic of Kenya.

5. Safety, Temporary works and Discoveries

- 5.1 The Contractor shall be responsible for design of temporary works and shall obtain approval of third parties to the design of the temporary works where required.
- 5.2 The Contractor shall be responsible for the safety of all activities on the Site.
- 5.3 Any thing of historical or other interest or significant value unexpectedly discovered on the Site shall be the property of the Employer. The Contractor shall notify the Employer's Representative of such discoveries and carry out the Employer's Representative's instructions for dealing with them.

6. Work Programme and Sub-contracting

- 6.1 Within seven days after Site possession date, the Contractor shall submit to the Employer's Representative for approval a programme showing the general methods, arrangements, order and timing for all the activities in the Works.
- 6.2 The Contractor may sub-contract the Works (but only to a maximum of 25 percent of the Contract Price) with the approval of the Employer's Representative. However, he shall not assign the Contract without the approval of the Employer in writing. Sub-contracting shall not alter the Contractor's obligations.

7. The site

- 7.1 The Employer shall give possession of all parts of the Site to the Contractor.
- 7.2 The Contractor shall allow the Employer's Representative and any other person authorized by the Employer's Representative, access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.

8. Instructions

- 8.1 The Contractor shall carry out all instructions of the Employer's Representative which are in accordance with the Contract.

9. Extension of Completion Date

- 9.1 The Employer's Representative shall extend the Completion Date if an occurrence arises which makes it impossible for completion to be achieved by the Intended Completion Date. The Employer's Representative shall decide whether and by how much to extend the Completion Date.
- 9.2 For the purposes of this Clause, the following occurrences shall be valid for consideration;

Delay by:-

- (a) force majeure, or
- (b) reason of any exceptionally adverse weather conditions, or
- (c) reason of civil commotion, strike or lockout affecting any of the trades employed upon the Works or any of the trades engaged in the preparation, manufacture or transportation of any of the goods or materials required for the Works, or
- (d) reason of the Employer's Representative's instructions issued under these Conditions, or
- (e) reason of the contractor not having received in due time necessary instructions, drawings, details or levels from the Employer's Representative for which he specifically applied in writing on a date which having regard to the date for Completion stated in the appendix to these Conditions or to any extension of time then fixed under this Clause was neither unreasonably distant from nor unreasonably close to the date on which it was necessary for him to receive the same, or

- (f) delay on the part of artists, tradesmen or others engaged by the Employer in executing work not forming part of this Contract, or
- (g) reason of delay by statutory or other services providers or similar bodies engaged directly by the Employer, or
- (h) reason of opening up for inspection of any Work covered up or of the testing or any of the Work, materials or goods in accordance with these conditions unless the inspection or test showed that the Work, materials or goods were not in accordance with this Contract, or
- (i) reason of delay in appointing a replacement Employer's Representative, or
- (j) reason of delay caused by the late supply of goods or materials or in executing Work for which the Employer or his agents are contractually obliged to supply or to execute as the case may be, or
- (k) delay in receiving possession of or access to the Site.

10. Management Meetings

- 10.1 A Contract management meeting shall be held regularly and attended by the Employer's Representative and the Contractor. Its business shall be to review the plans for the remaining Work. The Employer's Representative shall record the business of management meetings and provide copies of the record to those attending the meeting and the Employer. The responsibility of the parties for actions to be taken shall be decided by the Employer's Representative either at the management meeting or after the management meeting and stated in writing to all who attend the meeting.
- 10.2 Communication between parties shall be effective only when in writing.

11. Defects

- 11.1 The Employer's Representative shall inspect the Contractor's work and notify the Contractor of any defects that are found. Such inspection shall not affect the Contractor's responsibilities. The Employer's Representative may instruct the Contractor to search for a defect and to uncover and test any Work that the Employer's Representative considers may have a defect. Should the defect be found, the cost of uncovering and making good shall be borne by the Contractor. However, if there is no defect found, the cost of uncovering and making good shall be treated as a variation and added to the Contract Price.

- 11.2 The Employer's Representative shall give notice to the Contractor of any defects before the end of the Defects Liability Period, which begins at Completion, and is defined in the Appendix to Conditions of Contract.
- 11.3 Every time notice of a defect is given, the Contractor shall correct the notified defect within the length of time specified by the Employer's Representative's notice. If the Contractor has not corrected a defect within the time specified in the Employer's Representative's notice, the Employer's Representative will assess the cost of having the defect corrected by other parties and such cost shall be treated as a variation and be deducted from the Contract Price.

12. Bills of Quantities/Schedule of Rates

- 12.1 The Bills of Quantities/Schedule of Rates shall contain items for the construction, installation, testing and commissioning of the Work to be done by the Contractor. The Contractor will be paid for the quantity of the Work done at the rates in the Bills of Quantities/Schedule of Rates for each item. Items against which the Tenderer enters no rate will not be paid for when executed and shall be deemed covered by the rates for other items in the Bills of Quantities/Schedule of Rates.
- 12.2 Where Bills of Quantities do not form part of the Contract, the Contract Price shall be a lump sum (which shall be deemed to have been based on the rates in the Schedule of Rates forming part of the tender) and shall be subject to re-measurement after each stage.

13. Variations

- 13.1 The Contractor shall provide the Employer's Representative with a quotation for carrying out the variations when requested to do so. The Employer's Representative shall assess the quotation and shall obtain the necessary authority from the Employer before the variation is ordered.
- 13.2 If the Work in the variation corresponds with an item description in the Bill of Quantities/Schedule of Rates, the rate in the Bill of Quantities/Schedule of Rates shall be used to calculate the value of the variation. If the nature of the Work in the variation does not correspond with items in the Bill of Quantities/Schedule of Rates, the quotation by the Contractor shall be in the form of new rates for the relevant items of Work.
- 13.3 If the Contractor's quotation is unreasonable, the Employer's Representative may order the variation and make a change to the Contract Price, which shall be based on the Employer's Representative's own forecast of the effects of the variation on the Contractor's costs.

14. Payment Certificates and Final Account

- 14.1 The Contractor shall be paid after each of the following stages of Work listed herebelow (subject to re-measurement by the Employer's Representative of the Work done in each stage before payment is made). In case of lump-sum Contracts, the valuation for each stage shall be based on the quantities so obtained in the re-measurement and the rates in the Schedule of Rates.
- (i) Advance payment **NIL** (*percent of Contract Price, [after Contract execution] to be inserted by the Employer*).
 - (ii) First stage (*define stage*) **AS PER PROGRESS**
 - (iii) Second stage (*define stage*) **AS PER PROGRESS**
 - (iv) Third stage (*define stage*) **AS PER PROGRESS**
 - (v) After defects liability period.
- 14.2 Upon deciding that Works included in a particular stage are complete, the Contractor shall submit to the Employer's Representative his application for payment. The Employer's Representative shall check, adjust if necessary and certify the amount to be paid to the Contractor within 21 days of receipt of the Contractor's application. The Employer shall pay the Contractor the amounts so certified within 30 days of the date of issue of each Interim Certificate.
- 14.3 The Contractor shall supply the Employer's Representative with a detailed final account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Employer's Representative shall issue a Defect Liability Certificate and certify any final payment that is due to the Contractor within 30 days of receiving the Contractor's account if it is correct and complete. If it is not, the Employer's Representative shall issue within 21 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 Employer's Representative shall decide on the amount payable to the Contractor and issue a Final Payment Certificate. The Employer shall pay the Contractor the amount so certified within 60 days of the issue of the Final Payment Certificate.
- 14.4 If the period laid down for payment to the Contractor upon each of the Employer's Representative's Certificate by the Employer has been exceeded, the Contractor shall be entitled to claim simple interest calculated pro-rata on the basis of the number of days delayed at the

Central Bank of Kenya's average base lending rate prevailing on the first day the payment becomes overdue. The Contractor will be required to notify the Employer within 15 days of receipt of delayed payments of his intentions to claim interest.

15. Insurance

15.1 The Contractor shall be responsible for and shall take out appropriate cover against, among other risks, personal injury; loss of or damage to the Works, materials and plant; and loss of or damage to property.

16. Liquidated Damages

16.1 The Contractor shall pay liquidated damages to the Employer at the rate 0.001 per cent of the Contract price per day for each day that the actual Completion Date is later than the Intended Completion Date except in the case of any of the occurrences listed under Clause 9.2. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's liabilities.

17. Completion and Taking Over

17.1 Upon deciding that the Work is complete the Contractor shall request the Employer's Representative to issue a Certificate of Completion of the Works, upon deciding that the Work is completed.

The Employer shall take over the Site and the Works within seven days of the Employer's Representative issuing a Certificate of Completion.

18. Termination

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

- (a) the Contractor stops Work for 30 days continuously without reasonable cause or authority from the Employer's Representative;
- (b) the Contractor is declared bankrupt or goes into liquidation other than for a reconstruction or amalgamation;
- (c) a payment certified by the Employer's Representative is not paid by the Employer to the Contractor within 30 days after the expiry of the payment periods stated in Sub-Clauses 14.2 and 14.3 hereabove.

- (d) the Employer's Representative gives notice that failure to correct a particular defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time.

18.2 If the Contract is terminated, the Contractor shall stop Work immediately, and leave the Site as soon as reasonably possible. The Employer's Representative 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.

19. Payment Upon Termination

19.1 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 Site, plant, equipment and temporary works.

19.2 The Contractor shall, during the execution or after the completion of the Works under this Clause, remove from the Site as and when required within such reasonable time as the Employer's Representative may in writing specify, any temporary buildings, plant, machinery, appliances, goods or materials belonging to him, and in default thereof, the Employer may (without being responsible for any loss or damage) remove and sell any such property of the Contractor, holding the proceeds less all costs incurred to the credit of the Contractor.

19.3 Until after completion of the Works under this Clause, the Employer shall not be bound by any other provision of this Contract to make any payment to the Contractor, but upon such completion as aforesaid and the verification within a reasonable time of the accounts therefore the Employer's Representative shall certify the amount of expenses properly incurred by the Employer and, if such amount added to the money paid to the Contractor before such determination exceeds the total amount which would have been payable on due completion in accordance with this Contract, the difference shall be a debt payable to the Employer by the Contractor; and if the said amount added to the said money be less than the said total amount, the difference shall be a debt payable by the Employer to the Contractor.

20. Corrupt Gifts and Payments of Commission

20.1 The Contractor shall not:

- (a) Offer or give or agree to give to any person in the service of the Employer any gifts or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract with the Employer or for showing or forbearing to show favour or disfavour to any person in relation to this or any other contract with the Employer.
- (b) Any breach of this Condition by the Contractor or by anyone employed by him or acting on his behalf (whether with or without the knowledge of the Contractor) shall be an offence under the Laws of Kenya.

21. Settlement of Disputes

21.1 Any dispute arising out of the Contract which cannot be amicably settled between the parties shall be referred by either party 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 of the Chartered Institute of Arbitrators, Kenya branch, on the request of the applying party.

APPENDIX TO CONDITIONS OF CONTRACT

THE EMPLOYER IS

Name: **Republic of Kenya,
Represented By:
The Vice Chancellor,
Pwani University College,**

Address: **P.O. Box 195, KILIFI**

Name of Employer's Representative: **The County Works Officer, Ministry of Public
Works, Kilifi County. Address: P.O. Box 409, KILIFI**

**The name (and identification number) of the Contract is
SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING
OF INTERNAL PLUMBING, SANITARY FITTINGS, DRAINAGE, AIR
CONDITIONING, ROOF TOP WATER TANKS, BOOSTER PUMPS, WATER
RETICULATION AND FIRE FIGHTING EQUIPMENT INSTALLATIONS.
(SUB-CONTRACT).**

**The Works consist SUPPLY, DELIVERY, INSTALLATION, TESTING AND
COMMISSIONING
OF INTERNAL PLUMBING, SANITARY FITTINGS, DRAINAGE, AIR
CONDITIONING, ROOF TOP WATER TANKS, BOOSTER PUMPS, WATER
RETICULATION AND FIRE FIGHTING EQUIPMENT INSTALLATIONS.
(SUB-CONTRACT)**

The Start Date shall be as in agreement with the main contractor

The Intended contract period for the whole of the Works shall be as in agreement with the main contractor

The following documents also form part of the Contract:

- a. **As listed in Clause 2**
- b. **The latest agreement and conditions of sub contract for building works by the Kenya Association of Building and Civil Engineering Contractors (KABCEC)**

The Site Possession Date shall be as in agreement with the main contractor.

The Site is located within **Kilifi Town-Kilifi County**

The Defects Liability Period is **6 Months**

Amount of Tender Security is Kshs.

The name and Address of the Employer's representative for the purposes of submission of tenders
Is **The County Works Officer, Ministry of Public
Works, Kilifi County**

The tender opening date and time is **as stated in the invitation to tender letter.**

The amount of performance security is **5 percent** bank guarantee of the Contract Price.

Period of final measurement : **3 months from practical completion**

Liquidated and Ascertained damages: **At the rate of Kshs. 5000.00 per week or part there of**

Prime cost sums for which the Contractor desires to tender : **Nil**

Period of interim certificate: **Monthly**

Period of honouring certificate: **45 days**

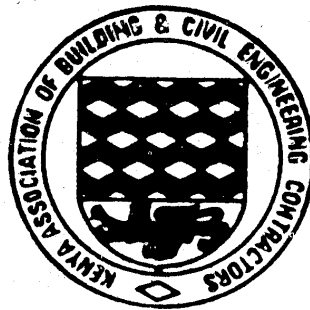
Percentage of certified value retained: **10%**

Limit of retention fund: **5%**

PART B

II. SUB-CONTRACT AGREEMENT (KABCEC)

**AGREEMENT AND CONDITIONS
OF SUB-CONTRACT FOR
BUILDING WORKS**



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Civil Engineering Contractors**
with the sanction of:
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and
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ORIGINAL
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1.0 AGREEMENT

1.1 This agreement is made on
between
of (or whose registered office is situated at)
.....
(hereinafter called “the Contractor”) of the one part
and
of (or whole registered office is situated at)
.....
(hereinafter called “the Sub-Contractor”) of the other part:

1.2 SUPPLEMENTAL to an agreement(hereinafter referred to as the “the main contract”)
made on
Between
.....
(hereinafter called “the Employer”) of the one part and the Contractor of the other part based on the Agreement and Conditions of Contract for Building Works, published by the Joint Building Council, Kenya
..... edition.

1.3 WHEREAS the contractor is desirous of sub-letting to the Sub-Contractor
.....
.....
.....

hereinafter called “the sub-contractor works” at.....

on Land Reference No.....being part of the main contract works.

1.4 And whereas the Sub-Contractor has supplied the Contractor with a priced copy of the bills of quantities (hereinafter referred to as “the sub-contractor bills”), where applicable, which together with the drawings numbered.....

.....
(hereinafter referred to as “the sub-contract drawings), the specifications and the conditions of sub-contract have been signed by or on behalf of the parties thereto.

And whereas the Sub-Contractor has had reasonable opportunity of inspecting the main contract or a copy thereof except the detailed prices of the Contractor included in the bills of quantities or schedule of rates.

1.5 And whereas the Architect, with the approval of the Employer, has nominated the Sub-Contractor to carry out the works described at clause 1.3 herein:

NOW IT IS HEREBY AGREED AS FOLLOWS:

1.6 For the consideration herein stated, the Sub-Contractor shall upon and subject to the conditions annexed hereto carry out and complete the sub-contract works shown upon the sub-contract drawings and described by or referred to in the sub-contract bills, specifications and in the said conditions.

1.7 The Contractor shall pay the Sub-Contractor the sum of the Kshs (in words).....
.....
.....Kshs.....)
(hereinafter referred to as “the sub-contractor price”) or such sum as shall become payable hereinafter at the times and in manner specified in the said conditions.

1.8 The term ‘Architect’, ‘Quantity Surveyor’ and ‘Engineer’, where applicable, shall refer to the persons appointed by the Employer to

- 1.9** administer the sub-contract in accordance with the main contract agreement. Where applicable, reference to the Architect shall be deemed to include reference to the Engineer.
- 1.10** In the event of the need to appoint a replacement Architect, Quantity Surveyor, Engineer or other specialist (whether named in this agreement or not) the Employer shall make such appointment as soon as practicable after the need for such appointment arises and shall communicate the appointment to the Sub-Contractor through the Contract.
- 1.11** Where the sub-contract does not incorporate bills of quantities, the term “sub-contract bills” and “bills of quantities” wherever appearing shall be deemed deleted and replaced with the term “schedule of rates” as applicable.
- 1.12** The terms defined in clause 1.0 of the main contract shall have the same meaning in this sub-contract as that assigned to them therein.
- 1.13** AS WITNESS the hands of the said parties;

Signed by the said.....(Contractor)

In the presence of

Name

Address

Signed by the said.....(Sub-Contractor)

In the presence of

Name

Address

CONDITIONS OF SUB-CONTRACT

2.0 GENERAL OBLIGATIONS OF THE CONTRACTOR

The Contractor shall:

- 2.1** Timeously obtain from the Architect on behalf of the Sub-Contractor all drawings, necessary details, instructions and other information required by the Sub-Contractor for the proper carrying out of the sub-contract works.
- 2.2** Provide all such facilities and attend upon the Sub-Contractor as required and as provided in the specifications, bills of quantities and these conditions to the extent compatible with the provisions of the main contract
- 2.3** Observe, perform and comply with all the provisions of the main contract and of this sub-contract on the part of the Contractor to be observed, performed and complied with to ensure satisfactory completion of the sub-contract works.

3.0 GENERAL OBLIGATIONS OF THE SUB-CONTRACTOR

- 3.1** The Sub-Contractor shall be deemed to have notice of all the provisions of the main contract except the detailed prices of the Contractor included in the bills of quantities or in the schedule of rates.
- 3.2** The Sub-Contractor shall carry out and complete the sub-contract works in accordance with this sub-contract and in all respects to the reasonable satisfaction of the Contractor and of the Architect and in conformity with all reasonable directions and requirements of the Contractor regulating the due carrying out of the contract works.
- 3.3** The Sub-Contractor shall observe, perform and comply with all the provisions of the main contract on the part of the Sub-Contractor to be observed, performed and complied with so far as they relate and apply to the sub-contract works or any portion thereof and are not inconsistent with the expressions of this sub-contract as if all the same were set out herein.
- 3.4** Without prejudice to the generality of the foregoing requirements, the Sub-Contractor shall especially observe, perform and comply with the provisions of clauses 9.0, 18.0, 19.0 22.0, 30.0, 31.0, 34.0 and 36.0 of the main contract as they apply to the sub-contract w

4.0 SUB-CONTRACT DOCUMENTS

- 4.1** The sub-contract documents for use in the carrying out of the sub-contract works shall be:-
 - 4.1.1 The agreement and these conditions
 - 4.1.2 The sub-contract drawings as listed in the agreement
 - 4.1.3 The sub-contract bill of quantities or schedule of rates as applicable
 - 4.1.4 The specifications as separately supplied or as contained in the sub-contract bills.
- 4.2** Upon the execution of the sub-contract, the Contractor shall register the agreement with the relevant statutory authority and pay all fees, charges, taxes, duties and all costs arising therefrom.
- 4.3** The manner of supplying contract documents, their custody, display on site and their interpretation in the event of discrepancies shall be as provided in the main contract in respect of the main contract documents with the necessary amendments made to refer to the sub-contract.

5.0 GENERAL LIABILITY OF THE SUB-CONTRACTOR

- 5.1** The Sub-Contractor shall be liable for and shall indemnify the Contractor against and from:
 - 5.1.1 Any breach, non-observance or non-performance by the Sub-Contractor, his servants or agents of any of the said provisions of the main contract and of this sub-contract.
 - 5.1.2 Any act or omission of the Sub-Contractor, his servants or agents which involve the Contractor in any liability to the Employer under the main contract
 - 5.1.3 Any claim, damage, loss or expense due to or resulting from any negligence or breach of duty on the part of the Sub-Contractor, his servants or agents.
 - 5.1.4 Any loss or damage resulting from any claim under any statute or common law by an employee of the Sub-Contractor in respect of personal injury or death arising out of or in the course of his employment.

5.2 Provided that nothing contained in this sub-contract shall impose any liability on the Sub-Contractor in respect of any negligence or breach of duty on the part of the Employer, the Contractor, other sub-contractors or their respective servants or agents nor create any privity of contract between the Sub-Contractor and the Employer or any other sub-contractor.

6.0 INSURANCE AGAINST INJURY TO PERSONS AND PROPERTY

6.1 Without prejudice to his liability to indemnify the Contractor under clause 5.0 above, the Sub-Contractor shall maintain:-

6.1.1 Such insurances as are necessary to cover the liability of the Sub-Contractor in respect of injury or damage to property including damage to the works arising out of or in the course of or by reason of the carrying out of the sub-contract works except for liability against the contingencies specified at clause 6.3 herein.

6.1.2 The insurances required under sub clause 6.1.1 and 6.1.2 above shall be placed with insurers approved by the Contractor and the Architect.

6.2 Notwithstanding the provisions of clause 23.0 of these conditions, the Contractor shall not be obliged to make payments to the Sub-Contractor before the said policies have been provided.

6.3 Where clause 13.0 of the main contract applies, the sub-contract works, including materials and goods of the sub-Contractor delivered to the works, shall as regards loss or damage by the contingencies stated at clause 13.0 therein, namely, fire, earthquake, fire following earthquake, lightning, explosion, storm, tempest, flood, bursting or overflowing of water tanks, apparatus or pipes, aircraft and other aerial devices or articles dropped there from, riot and civil commotion, be at the sole risk of the contractor. The Contractor shall cover his liability for the works by procuring insurances as required in the said clause.

6.4 Where clause 14.0 or 15.0 of the main contract applies, the sub-contract works, including materials and goods of the Sub-Contractor delivered to the works shall, as regards loss or damage by the contingencies stated therein be at the sole risk of the Employer. The Employer shall cover his liability for the works by procuring insurances as required in the said clause.

- 6.5** The Sub-Contractor shall observe and comply with the conditions contained in the policy or policies of insurance of the Contractor or of the Employer, as the case may be, as regards loss or damage which may be caused by the stated contingencies. For this purpose, the Contractor or the Employer as the case may be, shall avail the said policies to the Sub-Contractor for his perusal.
- 6.6** If any loss or damage affecting the sub-contract works or any part thereof or any unfixed goods or materials is occasioned by any one or more of the said contingencies, then,
- 6.6.1** The occurrence of such loss or damage shall be disregarded in computing any amounts payable to the Sub-Contractor under the sub-contract, and
- 6.6.2** The Sub-Contractor shall, with due diligence, restore the work damaged, replace or repair any unfixed materials or goods which have been destroyed or damaged, remove and dispose of any debris and proceed with the carrying out and completion of the sub-contract works.
- 6.6.3** The restoration of work damaged the replacement and repair of unfixed materials and goods and the removal of debris shall be deemed to be a variation required by the Architect. Such work shall be paid for in accordance with clause 30.0 of the main contract.

7.0 PERFORMANCE BOND

Before commencing the works, the Sub-Contractor shall provide one surety who must be an established bank or insurance company to the approval of the Contractor and who will be bound to the Contractor in the sum equivalent to ten per cent (10 %) of the sub-contract price for the due performance of the sub-contract until the certified date of practical completion. Notwithstanding the provisions of clause 23.0 of these conditions, no payments shall be made to the Sub-Contractor before the said bond is provided.

8.0 POSSESSION OF SITE AND COMMENCEMENT OF WORKS

8.1 Within the period stated in the appendix to these conditions, the Contractor shall give possession of the site works to the Sub-Contractor and such access as may be necessary to enable the Sub-Contractor to commence and proceed with the sub-contract works in accordance with the sub-contract.

8.2 On or before the date for commencement of works stated in the appendix to these conditions, the Sub-Contractor shall commence the carrying out of the sub-contract works and shall proceed regularly and diligently with the same in accordance with the sub-contract programme, the main contract programme and or with the progress of the main contract works and complete on or before the date stated in the appendix to these conditions as the date for practical completion or within any extended time granted under clause 25.0 of these conditions.

9.0 ARCHITECT'S INSTRUCTIONS

9.1 The Sub-Contractor shall forthwith comply with all the instructions issued to him by the Architect, either directly or through the Contractor, in regard to any matter in respect of which the Architect is expressly empowered by the main contract conditions to issue instructions.

9.2 The manner of complying with or querying the validity of an Architect's instruction shall be as provided in clause 22.0 of the main contract. The Sub-Contractor shall not be obliged to carry out instructions not issued in the manner provided therein.

10.0 VARIATIONS

10.1 The term "variation" shall have the meaning assigned to it at clause 30.0 of the main contract.

10.2 The valuation of variations shall be made by the Quantity Surveyor in accordance with sub-clause 30.6 of the main contract.

10.3 Effect shall be given to the measurement and valuation of variations in interim certificates and by the adjustment of the sub-contract price.

11.0 LIABILITY FOR OWN EQUIPMENT

The construction equipment and other property belonging to or provided by the Sub-Contractor and brought onto the site for carrying out the works shall be at the sole risk of the Sub-Contractor. Any loss or damage to the same or caused by the same shall, except for any loss or damage due to any negligence, omission or default of the Contractor, be at the sole risk of the Sub-Contractor who shall indemnify the Contractor against loss, damage or claims in respect thereof. Insurance against any such loss, damage or claims shall be the sole responsibility of the Sub-Contractor.

12.0 PROVISION OF FACILITIES BY THE CONTRACTOR

- 12.1** Where provided in the main contract, the Contractor shall supply at his own cost all necessary water, lighting, electric power, telephones and security required for the sub-contract works. Where not so provided, the Sub-Contractor shall provide the said services at his own cost.
- 12.2** Except as otherwise provided in the main contract, the Sub-Contractor shall construct at his own expense all necessary workshops, stores, offices, workers' accommodation and other temporary buildings required for the carrying out of the works at such places on site as the Contractor shall identify. The Contractor undertakes to give the sub-Contractor the required space and all reasonable facilities for such construction. Upon practical completion of the works, the Sub-contractor shall remove the said facilities and reinstate disturbed surface to the satisfaction of the Contractor.
- 12.3** The Contractor shall provide, without charge, general attendance to the Sub-Contractor to facilitate the carrying out of the works which attendance shall include facilities for access to and movement within the site and sections or parts of the building or buildings where the sub-contract works are being carried out, the use of temporary roads, paths and access ways, sanitary and welfare facilities.
- 12.4** The Contractor shall permit the Sub-Contractor to use, without charge, at all reasonable times, any scaffolding and hoisting equipment belonging to or provided by the Contractor while it remains so erected upon the site. The use by the Sub-Contractor of any other equipment, facilities or services provided by the Contractor for the works shall be subject to private arrangements between the parties hereto and shall not be regulated by these conditions.
- 12.5** Provided that such use of the scaffolding and hoisting equipment shall be on the express condition that no warranty or other liability on the part of the Contractor shall be created or implied in regard to fitness, condition or suitability for the intended purpose except that the Sub-Contractor shall be liable for any damage caused thereto or thereby.
- 12.6** Where required, the Contractor shall provide the facilities, equipment and the like and carry out any necessary builder' works within a reasonable time of the request by the Sub-Contractor to enable timely performance of the sub-contract.

13.0 LIABILITY FOR OWN WORK

- 13.1** The Contractor and the Sub-Contractor shall be liable for the due carrying out of their respective works in accordance with their respective contracts without causing damage or injury to the works of the other sub-contractors, and in particular:
- 13.2** Should the carrying out of the sub-contract works cause injury or damage to the main contract works, or to the work of the other sub-contractors, the Sub-contractor shall rectify the damage so caused at his own cost.
- 13.3** Should the carrying out of the main contract works cause damage or injury to the sub-contract works, the Contractor shall rectify the damage at his own cost.
- 13.4** If in the course of carrying out the sub-contract works, the Sub-Contractor is required to carry out work not included in his sub-contract by reason of any materials or workmanship not being in accordance with the main contract or with other sub-contracts, the Contractor shall reimburse the Sub-Contractor the expenses incurred therein.

14.0 CO-OPERATION IN USE OF FACILITIES

- 14.1** The Contractor and the Sub-Contractor undertake to co-operate with each other and co-ordinate work arrangements and procedures required in carrying preventing interference, disruption or disturbance to the progress of the works or to the activities of other sub-contractors.
- 14.2** The Contractor and the Sub-Contractor undertake not to wrongfully use or interfere with equipment, scaffolding, appliances, ways, temporary works, temporary buildings and other property belonging to or provided by the other part or by other sub-contractors.
- 14.3** Provided that nothing contained in this clause shall prejudice or limit the rights of the Contractor or of the sub-Contractor in carrying out their respective statutory and or contractual duties under this sub-contract or under the main contract.

15.0 ASSIGNMENT AND SUBLETTING

- 15.1** Neither the Contractor nor the Sub-Contractor shall, without the written consent of the other and the Employer, assign this sub-contract.
- 15.2** The Sub-Contractor shall not sub-let the whole of the works without the written consent of the Contractor and the Architect.
- 15.3** Provided that any assignment and any sub-contracts as well as this sub-contract shall terminate immediately upon (for whatever reason) of the main contract.

16.0 WORK PRIOR TO APPOINTMENT OF CONTRACTOR

- 16.1** Where the Sub-Contractor is appointed before the Contractor is appointed, any work done by the Sub-Contractor prior to the said appointment shall be treated as a separate contract between the Employer and the Sub-Contractor and shall be valued by the Quantity Surveyor and paid for directly by the Employer without the involvement of the Contractor.
- 16.2** Where the Sub-Contractor is appointed before the Contractor is appointed, the Sub-Contractor shall be permitted, when the identity of the Contractor is known and within 30 days thereof, to raise objections (on reasonable grounds) against entering into a sub-contract with the Contractor
- 16.3** Where work which is outside the sub-contract is ordered directly by Employer or the Architect, that work shall be treated as a separate contract between the Sub-Contractor and the Employer and shall be valued and paid for directly to the Sub-Contractor in accordance with sub-clause 16.1 herein without the involvement of the Contractor. The cost of equipment, facilities and the like provided by the Contractor to the Sub-contractor and any builder's work carried out by the Contractor with regard to such work shall be paid directly by the Sub-Contractor to the Contractor.

17.0 SUB-CONTRACTOR DESIGN

Where the sub-contract includes a design component by the Sub-Contractor, the design shall be to the approval of the Architect and the Employer. Notwithstanding and approvals, the Sub-Contractor shall be liable directly to the Employer for any consequences of failure of the design to comply with the requirements of the Employer or to be fit or suitable for the purposes for which the sub-contract works or the relevant part thereof were intended.

18.0 SPECIFICATION OF GOODS, MATERIALS AND WORKMANSHIP

18.1 All materials, goods and workmanship shall, so far as procurable, be of the respective kinds and standards described in the sub-contract bills, specifications and drawings.

18.2 The provisions of clause 23.0 of the main contract regulating the procurement, specification and quality assurance of materials, processes and workmanship and the requirements of clause 24.0 therein dealing with the provision of samples and the carrying out of specified tests shall apply to the sub-contract in the same manner as they apply to the main contract.

19.0 COMPLIANCE WITH STATUTORY AND OTHER REGULATION

The Sub-Contract shall comply with all statutory and other regulations of competent authorities regulating the carrying out of the works in accordance with the provisions of clause 17.0 of the main contract, as applicable.

20.0 ROYALTIES AND PATENT RIGHTS

20.1 All royalties or other sums payable in respect of the supply and use of any patented articles, processes or inventions in carrying out the works as described by or referred to in the sub-contract bills, specifications or drawings shall be deemed to have been included in the sub-contract price.

20.2 The provision of clause 25.0 of the main contract dealing with the same shall apply to the sub-contract in the same manner as they apply to the main contract.

21.0 ANTIQUITIES AND OTHER OBJECTS OF VALUE

All fossils, antiquities and other objects of interest or value which may be found on the site or in excavating the same during the progress of the sub-contract shall be dealt with in accordance with the provisions of clause 44.0 of the main contract.

22.0 SUSPENSION OF WORKS

22.1 An instruction by the Architect to postpone or suspend the works under clause 28.0 of the main contract shall have the same effect on the sub-contract works as it has on the main contract works.

22.2 If the suspension arises due to default by the contractor and the sub-contract works are adversely affected by the suspension, the sub-contractor shall be entitled to reimbursement by the contractor of all expenses arising there from.

22.3 If the suspension arises due to default by the sub-contractor, the sub-contractor shall be liable to the contractor for all expenses arising there from.

22.4 A notice by the contractor to suspend the works under clause 29.0 of the main contract shall have the same effect on the sub-contract works as it has on the main contract works.

22.5 Should the sub-contract works be adversely affected by suspension under clause 29.0 of the main contract, the sub-contractor shall be entitled to the remedies provided for at clauses 25.0 and 26.0 of this sub-contract.

23.0 PAYMENTS

23.1 Procedures for originating and processing applications for payments and payment certificates as regards the sub-contract works shall be the same as those prescribed for the Contractor in the main contract at clause 34.0. All references therein to the contractor shall be deemed to include references to the Sub-contractor.

23.2 Before submitting an application for payment to the Quantity Surveyor in accordance with clause 34.1 of the main contract, the Contractor shall give the Sub-Contractor a notice of not less than 7 days to submit the details of the amounts which the Sub-Contractor considers himself entitled to for the relevant period. Such details, when received, shall be annexed to the said Contractor's application.

23.3 Where it is necessary to measure the sub-contract works for purpose of interim valuation or for the preparation of the final account, the Quantity Surveyor shall give the Sub-Contractor a reasonable opportunity to be present at the time of the measurements and to take notes and measurements as he may require.

23.4 Neither the Quantity Surveyor nor the Architect shall be bound to issue a valuation or a payment certificate in respect of the sub-contract works, as the case may be, whose value is less than the amount stated in the appendix to these conditions as the minimum amount of a payment certificate before the issue of the certificate of practical completion of the main contract or of the sub-contract, as applicable.

23.5 Provided that where the minimum amount of a certificate inserted in the appendix to these conditions has been achieved but the corresponding minimum inserted in the appendix to the main contract in respect of the Contractor's work has not been achieved, or the Contractor has not applied for payment within the stated period, the Architect may with the consent of the Contractor, issue a payment certificate directly to the Sub-Contractor for payment by the Employer.

- 23.6** Within 7 days of receipt by the Contractor of payment by the Employer, the Contractor shall notify and pay to the Sub-Contractor the total value certified therein in respect of the sub-contract works less the portion of the retention money attributable to the sub-contract works and less amounts previously paid to the Sub-Contractor.
- 23.7** Where certificates are not paid by the Employer within the prescribed period, the Sub-Contractor shall be entitled to be paid by the Contractor, upon receipt of payment from the Employer, the interest certified for the delay in accordance with sub-clause 34.6 of the main contract in respect of the portion of the sub-contract works included in the certificate.
- 23.8** Where the Contractor has received payment from the Employer but has not released the appropriate amount to the Sub-Contractor within the stated period, the Contractor shall pay to the Sub-Contractor in addition to the amount not paid, simple interest on the unpaid amount for the period it remains unpaid at the commercial bank lending rate in force during the period of default.
- 23.9** If, upon application by the Sub-Contractor and Architect agree, or if the Contractor fails to make payment to the Sub-Contractor in accordance with sub-clause 23.6 herein and continues such default for 14 days thereafter, the Architect may issue a payment certificate directly to the Sub-Contractor for payment by the Employer, where applicable, and deduct the amount from subsequent payment to the Contractor.
- 23.10** Upon the issue of the certificate of practical completion and the release of one half of the total amount of the retention of money to the Contractor, the Contractor shall pay the portion attributable to the sub-contract to the Sub-Contractor within 7 days of receipt of the payment.
- 23.11** Upon the issue of the certificate of rectification of defects and receipt of the balance of the retention money by the Contractor, the Contractor shall pay the balance of the portion of the retention money attributable to the sub-contract to the Sub-Contractor within 7 days of receipt of the payment.
- 23.12** The sub-contract final account shall be agreed between the Sub-Contractor, the Contractor, the Quantity Surveyor and the Architect and shall be annexed to the Contractor's final accounts, which shall be agreed as provided for in the main contract. For purpose of finalizing the accounts, the Quantity Surveyor may request the Sub-Contractor to submit further documents, as he may deem necessary.

23.13 The final certificate issued under sub-clause 34.21 of the main contract shall be final and binding on the Sub-Contractor in the same manner it is binding on the Contractor.

23.14 If the Architect desires to secure final payment to the Sub-Contractor before final payment is due to the Contractor, the provisions of sub-clause 31.10 of the main contract shall apply.

23.15 The Contractor shall be entitled to deduct from or set off against any money due from him to the Sub-Contractor in interim certificates any sum or sums which the Sub-Contractor is liable to pay to the Contractor arising under or in connection with the sub-contract.

24.0 PRACTICAL COMPLETION AND DEFECTS LIABILITY

24.1 The Sub-Contractor shall proceed with the works regularly and diligently and complete the same within the period stated in the appendix to this sub-contract or within such extended period as may be granted under clause 25.0 of this sub-contract.

24.2 Where the sub-contract works are to be completed in sections or where the sub-contract works are to be completed in advance of the main contract works, the provisions of clause 42.0 of the main contract shall apply, as appropriate, to the sub-contractor in the same manner as they apply to the main contract.

24.3 The procedures for certifying practical completion and for dealing with defects in the sub-contract works as well as the main contract works are as prescribed at clause 41.0 of the main contract. Upon the issue of the certificate of practical completion of the whole of the works or of the sub-contract works, as applicable, the Sub-contractor shall be entitled to release of one half of the retention money attributable to the sub-contract works within 7 days after the Contractor has received payment.

24.4 The balance of the retention money shall be released to the Sub-Contractor after the defects appearing in the works have been rectified in accordance with sub-clause 41.6 and 41.7 of the main contract and after the Contractor has received the said payment as provided for in sub-clause 34.16.3 of the main contract.

25.0 EXTENSION OF TIME

- 25.1** Upon it becoming reasonably apparent that the progress of the sub-contract works is or will be delayed, the Sub-Contractor shall forthwith give written notice of the cause of the delay to the Contractor and to the Architect with supporting details showing the extent of delay caused or likely to be caused. Thereafter, the Architect shall evaluate the information supplied by the Sub-Contractor and if in his opinion the completion of the works is likely to be or has been delayed beyond the date for practical completion stated in the appendix to these conditions or beyond any extended time previously fixed under this clause, by any of the reasons entitling the Contractor to extension of time under sub-clause 36.1 of the main contract, then the Architect shall, so soon as he is able estimate the length of the delay beyond the date or time aforesaid, recommend to the Contractor a fair and reasonable extension of time to be granted for the completion of the sub-contract works.
- 25.2** Thereupon, the Contractor shall grant in writing to the Sub-Contractor the recommended time. Provided that the Contractor shall not grant any extension of time to the Sub-Contractor without the written recommendation of the Architect. And provided that the Sub-Contractor shall constantly use his best endeavors to prevent delay and shall do all that may be reasonably required to proceed with the works.
- 25.3** The procedures for dealing with requests for extension of time and the observance of time limits prescribed at clause 36.0 of the main contract shall apply to the sub-contract in the same manner as they apply to the main contract.

26.0 LOSS AND EXPENSE CAUSED BY DISTURBANCE OF REGULAR PROGRESS

- 26.1** If upon written application being made by the Sub-Contractor to the Contractor and to the Architect, the Architect is of the opinion that the Sub-Contractor has been involved in direct loss and or expense, for which he would not be reimbursed by a payment made under any other provision in this sub-contract, by reasons of the regular progress of the sub-contract works or any part thereof having been materially affected by any of the reasons which would entitle the Contractor to reimbursement under clause 37.0 of the main contract, the Quantity Surveyor shall assess the amount of such loss and or expense.
- 26.2** Any amount so assessed shall be added to the sub-contract price and if an interim certificate is issued after the date of assessment, any such amount shall be added to the amount which would otherwise be stated as due in such certificate as regards the Sub-Contractor's entitlement.
- 26.3** The procedures for dealing with loss and or expense claims prescribed at clause 37.0 of the main contract shall apply to the sub-contract in the same manner as they apply to the main contract, as appropriate.

27.0 DAMAGES FOR DELAY IN COMPLETION

- 27.1** If the Sub-Contractor fails to complete the sub-contract works by the date for practical completion stated in the appendix to these conditions or within any extended time fixed under clause 25.0 herein, and the Architect certifies in writing that in his opinion the same ought reasonably so to have been completed, then the Sub-Contractor shall pay or allow to the Contractor a sum calculated at the rate stated in the said appendix as liquidated damages for the period during which the works shall so remain or have remained incomplete.
- 27.2** The Contractor may deduct such sum from any money due or to become due to the Sub-Contractor under the sub-contract or recover the same from the Sub-Contractor as a debt. Provided that the Contractor shall not be entitled to recover any liquidated damages from the Sub-Contractor without first obtaining the Architect's certificate of delay prescribed herein.

28.0 FLUCTATIONS

- 28.1** Unless otherwise stated in the sub-contract bills or specifications, the sub-contract price shall be deemed to have been calculated to include all duties and taxes imposed by statutory and other competent authorities in the country where the works are being carried out, and
- 28.2** The sub-contract price shall be deemed to be based on currency exchange rates current at the date of tender as regards materials or goods to be specifically imported for permanent incorporation in the works.
- 28.3** Should duties, taxes and exchange rates vary during the period of the contract, compensation thereof shall be calculated in accordance with sub-clause 35.1 and 35.2 of the main contract.
- 28.4** Compensation for change in prices of goods and materials incorporated in the works and in the rates of wages provided for at sub-clause 35.3, 35.4 and 35.5 of the main contract shall not apply to the sub-contract unless specifically provided for in the bill of quantities or specifications.

29.0 TERMINATION OF MAIN CONTRACT

- 29.1** If, for any reason, the contractor's employment is terminated either under clause 38.0, 39.0 or 40.0 of the main contract, this sub-contract shall thereupon also terminate.
- 29.2** Upon termination, the sub-contractor shall cease all work and vacate the site. He shall not remove any equipment or any materials brought onto the site for the carrying out of the works without the written approval of the contractor and the Architect
- 29.3** Where the termination of the main contract occurs without the default of the sub-contractor, the sub-contractor shall be paid by the contractor for work done in the like manner as the Contractor is paid at clause 39.5 of the main contract.
- 29.4** Where the termination of main contract arises from the default by the sub-contractor, the adjustment of the sub-contract accounts shall be performed in the like manner as is provided at sub-clause 38.8 of the main contract regarding the main contract accounts.

30.0 TERMINATION OF SUB-CONTRACT.

- 30.1** Without prejudice to any other rights and remedies which the contractor may possess, if the sub-contractor shall make default in any one or more of the respects which would entitle the employer to terminate the main contract under clause 38.0 therein, the contractor shall give the sub-contractor a notice, with a copy to the Architect and to the employer by registered post of recorded delivery specifying the default. Should the sub-contractor continue the default for 14 days after receipt of such notice or at any time thereafter repeat such default and should the Architect certify that the sub-contractor is in default, the contractor may terminate the Sub-contract forthwith after the expiry of the notice provided that the notice is not given unreasonably or vexatiously. The termination letter shall be copied to the Architect and to the Employer.
- 30.2** Where the sub-contract is terminated due to the default of the sub-contractor as in sub-clause 30.1 herein, the adjustment of sub-contract accounts shall be performed in the like manner as is provided at sub-clause 38.8 of the main contract regarding the main contract accounts.
- 30.3** Without prejudice to any other rights and remedies which the Sub-Contractor may possess, if the Contractor shall make default in one or more of the respects which, if committed by the Employer, would entitle the contractor to terminate the main contract under clause 39.0 therein, the Sub-Contractor shall give the Contractor a notice, with a copy to the Architect and to the Employer, by registered post or recorded delivery specifying the default. Should the contractor continue the default for 14 days after receipt of such notice or at any time thereafter repeat such default, and should the Architect certify that the contractor is in default, the Sub-Contractor may terminate the sub-contract forthwith after expiry of the notice, provided that the notice is not given unreasonably or vexatiously. The termination letter shall be copied to the Architect and to the Employer.
- 30.4** If the Sub-Contract is terminated due to the default of the Contractor as in sub-clause 30.3 herein, the Contractor shall pay the sub-contractor for work done in the like manner as the Contractor would be paid at sub-clause 39.5 of the main contract where the termination is done by the Contractor.

30.5 Where the sub-contract is terminated due to the default of the Contractor, all expenses arising from the termination shall be done wholly by the Contractor and the termination shall not create any liability on the Employer.

30.6 Where the sub-contract is terminated due to the default of the Sub-Contractor, the sub-contractor shall be liable to the contractor for all expenses arising there from.

31.0 SETTLEMENT OF DISPUTES

31.1 In case any dispute or difference shall arise between the Contractor and Sub-Contractor, either during the progress or after the completion or abandonment of the sub-contract 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 30 days of the notice.

31.2 The dispute shall be referred to the arbitration and final decision of a person to be agreed by the parties. Failing agreement to concur in the appointment of an Arbitrator, the Arbitrator shall be appointed by the Chairman or Vice Chairman of the Architectural Association of Kenya or the Chairman or Vice Chairman of The Chartered Institute of Arbitrators, Kenya Branch, at the request of the applying party.

31.3 The arbitration may be on the construction of this sub-contract or on any matter or thing of whatsoever nature arising there under or in connection therewith including the rights and liabilities of the parties during the currency of the sub-contract and subsequent to the termination of the sub-contract.

31.4 Where the sub-contractor is aggrieved by the manner in which the Architect has exercised or failed to exercise his powers stipulated in the main contract, or in the sub-contract or by any action or inaction of the Employer, and in particular, if he is aggrieved by:

31.4.1 The failure or refusal of the Architect to recommend to the contractor an extension of sub-contract time, or

31.4.2 The extend of the recommended time, or

- 31.4.3 The amount certified to the sub-contractor either in an interim in a final certificate, or
 - 31.4.4 The issue of an instruction which the sub-contractor contends is not authorized by the main contract or the sub-contract, or
 - 31.4.5. Any other matter left to the discretion of the Architect in the main contract or in the sub-contract, then.
- 31.5** Subject to the Sub-Contractor giving the Contractor such indemnity and security as the Contractor may reasonably require, the Contractor shall allow the Sub-Contractor to use the contractor's name and, if necessary, shall join the Sub-Contractor in arbitration proceeding against the employer to decide the matters in dispute or in difference.
- 31.6** Provided that no arbitration proceedings shall be commenced on any dispute or difference where notice of a dispute or difference where notice of a dispute or difference has not been given by the applying party within 90 days of the occurrence or discovery of the matter or issue giving rise to the dispute or difference.
- 31.7** 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.
- 31.8** In any event, no arbitration shall commence earlier than 90 days after the service of the notice of a dispute or difference, except as provided for at sub-clause 31.9 herein.
- 31.9** 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 without having to comply with sub clause 31.8 herein.

- 31.9.1 Whether or not the issue of an instruction by the Architect is authorized by the main contract or these conditions, and
- 31.9.2 Whether or not a payment certificate has been improperly withheld or is not in accordance with the main contract or these conditions or though issued, it has not been honoured.
- 31.10** All other matters in dispute shall only be referred to arbitration after the practical completion or alleged practical completion of the works or abandonment of the works or termination or alleged termination of the sub-contract, unless the Architect the contractor and the sub-contractor agree otherwise in writing.
- 31.11** The Arbitrator shall, without prejudice to the generality of his powers, have power 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 or included in any payment certificate.
- 31.12** The Arbitrator shall, without prejudice to the generality of his powers, have power 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.
- 31.13** Provided that any decision of the Architect which is final and binding on the contractor under the main contract shall be final and binding between the contractor and the sub-contractor.
- 31.14** The award of such Arbitrator shall be final and binding upon the parties.

SUB CONTRACTOR'S PERFORMANCE BOND

BY THIS AGREEMENT we.....(SURETY)

Of.....

Are bound.....(CONTRACTOR)

in the sum of Kenya shillings.....

(Kshs.....)

to be paid by us to the said

.....(CONTRACTOR)

WHEREAS by an agreement in writing dated

.....

.....(SUB-CONTRACTOR)

entered into a sub

contract with.....(CONTRACTOR)

to carry out and complete the works therein stated in the manner and
by the time therein specified all in accordance with he provisions
of the said sub-contract, namely: (description of works)

.....

.....
NOW the condition of the above written bond is such that if the said sub-
contractor, his executors, administrator, successors or assigns
shall duly perform his obligations under the sub-contract, or if on
default by the sub-contractor the surety shall satisfy and discharge
the damages sustained by the contractor thereby up to the amount
of the above written bond, then this obligation shall be void,
otherwise it shall remain in full force and effect. Upon default, and

without prejudice to his other rights under the sub-contract, the contractor shall be entitled to demand forfeiture of the bond and we undertake to honour the demand in the amount stated above.

PROVIDED always and it is hereby agreed and declared that no alteration in the terms of the said sub-contract or in the extent or nature of the works to be carried out and no extension of time by the contractor under the sub-contract shall in any way release the surety from any liability under the above written bond.

IN WITNESS whereof we have set out hand this..... day of

.....

Surety

Witness

Authorised of Power of Attorney No. 21

APPENDIX

Clause

Name of sub-contractor’s insurers

6.0.....

Name of sub-contractor’s surety

7.0

.....

Amount of surety

7.0

.....

Period of possession of site

8.1

.....

Date of commencement of works

8.2

.....

Date for practical completion

8.2

.....

Interval for application of payment certificates

23.1

.....

Minimum amount of payment certificate

23.4

.....

Percentage of certified value retained

23.6

.....

Limit of retention fund, if any	23.6
Name of the sub-contractor's bank for purposes of interest calculation.	23.7,23.8
Defects liability period	23.11
Period of final measurement and valuation	23.12
Damages of delay in completion at the rate of Kshs	27.1

.....

Signed by the said:

.....
.....

CONTRACTOR

SUB-CONTRACTOR

**1.70 APPENDIX TO THE AGREEMENT AND CONDITIONS OF
SUB- CONTRACT FOR BUILDING WORKS
Kenya Building and Civil Engineering Contractors (KABCEC)
document.**

1. CLAUSE 7.0

Change to read “.....in the sum equivalent to five per cent (5 %) of the subcontract.....”

SECTION C

SUB-CONTRACT PRELIMINARIES

AND

GENERAL CONDITIONS

1.10 **Execution of the Works**

CONTRACT PRELIMINARIES AND GENERAL CONDITIONS

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SECTION C

SUB-CONTRACT PRELIMINARIES AND GENERAL CONDITIONS

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:

Work detailed in the Specification and in the Contract Drawings.

The Republic of Kenya Document “General Conditions of Contract for Electrical and Mechanical Works”.

Other documents to which reference is made:

He shall also be deemed to have included for any expenditure which may be incurred in conforming to the above items (a), (b), (c) and observe this expense as being attached to the 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.

Discrepancies

The Contractor shall include all work either shown on the 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 contract is awarded.

Conditions of Contract Agreement

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

The Conditions of the Contract between the Main Contractor and any 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 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.

1.04 Payment

Payment will be made through certificates to the Main Contractor. All payments will be less retention as specified in the Main Contract. No payment will become due until materials are delivered to site.

1.05 Definition of Terms

Throughout these 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:

Employer: The term “**Employer**” shall mean The **Republic of Kenya**,
Represented By:
The Vice Chancellor,
Pwani University College,

- i) Address: **P.O. Box 195, KILIFI.**
- ii) **Architect:** The term “**Architect**” shall mean **The County Architect, Ministry of Public Works, Kilifi**
- iii) **Quantity Surveyor:** The term “**Quantity Surveyor**” shall mean **The County Quantity Surveyor, Ministry of Public Works, Kilifi**
- iv) **Civil/Structural Engineers:** The term “**Civil/Structural Engineers**” shall mean **The County Engineer (Structural), Ministry of Public Works, Kilifi**
- v) **Engineer:** The term “**Engineer**” shall mean **Senior Superintendent Mechanical (BS), Ministry of Public Works, Kilifi**
- vi) **Contractor:** The term “**Main Contractor**” shall mean the firm or company appointed to carry out the Works as specified in the Bills of Quantities and shall include his or their heir, executors, assigns, administrators, successors, and duly appointed representatives.
- vii) **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 contract agreement with the Contractor for the execution of the Sub-contract Works, and shall include his or their heirs, executors, administrators, assigns, successors and duly appointed representatives.

- viii) **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.

Contract Drawings: The term “**Contract Drawings**” shall mean those drawings required or referred to herein and forming part of the Bills of Quantities.

Working Drawings: The term “**Working Drawings**” shall mean those drawings required to be prepared by the Sub-contractor as hereinafter described.

- xi) **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.

- xii) **Abbreviations:**

CM shall mean **Cubic Metre**

SM shall mean **Square Metre**

LM shall mean **Linear Metre**

LS shall mean **Lump Sum**

mm shall mean **Millimeters**

No. Shall mean **Number**

Kg. shall mean **Kilograms**

KEBS or **KS** 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**

“**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.

1.06 **Site Location**

The site of the Contract Works is situated **at KILIFI TOWN**. 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.

1.07 Duration of Sub-Contract

The Contractor shall be required to phase his work in accordance with the Main contractor's programme (or its revision).

1.08 Scope of Contract Works

The contractor shall supply, deliver, unload, hoist, fix, test, commission and hand-over in satisfactory working order the complete installations specified hereinafter and/or as shown on the Contract Drawings attached hereto, including the provision of labour, transport and plant for unloading material and storage, and handling into position and fixing, also the supply of ladders, scaffolding the other mechanical devices to plant, installation, painting, testing, setting to work, the removal from site from time to time of all superfluous material and rubbish caused by the works.

The contractor shall supply all accessories, whether of items or equipment supplied by the Sub-Contractor but to be fixed and commissioned under this contract.

1.09 Extent of the Sub-contractor's Duties

At the commencement of the works, the 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 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 contractor from supplying the specified materials and equipment in time.

Materials supplied by others for installation and/or connection by the 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 contractor shall be responsible for verifying all dimensions relative to his work by actual measurements taken on site.

The 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 B.S. and C.P. respectively).
- c) General specifications of materials and works Section D of this document

- d) The Contract Drawings.
- e) The Bye-laws of the Local Authority.
- f) The Architect's and/or Engineer's Instructions.

The Contract Drawings and Specifications are to be read and construed together.

1.11 Validity of Tender

The tender shall remain valid for acceptance within 120 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 Contract

Unless specifically stated in the documents or the invitation to tender, this is a firm-price Contract and the contractor must allow in his tender for the increase in the cost of Labour and/or materials during the duration of the 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 contract period.

1.13 Variation

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

Any variation from the contract price in respect of any extra work, alteration or omission requested or sanctioned by the Engineer shall be agreed and confirmed in writing at the same time such variations are decided and shall not affect the validity of the 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 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 Project Manager to supply and/or install any equipment covered by the Prime Cost or Provisional Sums contained within the Contract documents.

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

The whole or any part of these sums utilized by the Contractor shall be deducted from the value of the 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 Government for an amount equal to 5 % of the Contract amount as Clause 28 of the Conditions of Contract.

1.16 Government Legislation and Regulations

The 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 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 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 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

In accordance with Clause 1.08 of this Specification the 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: the Contractor pay for all these services utilized.
- c) Fixing of anchorage and pipe supports in the shuttering, shall be supplied by the Contractor who shall also supply the Project Manager with fully dimensioned drawings detailing the exact locations.
- d)
 - i) Provision of scaffolding, cranes, etc. It shall be the Contractor's responsibility to liaise with the Project Manager to ensure that there is maximum co-operation with other nominated Sub-contractors in the use of scaffolding, cranes, etc.
 - ii) Any specialist scaffolding, cranes, etc. by the Contractor for his own exclusive use shall be paid for by the Sub-contractor.

1.20 Suppliers

The 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 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.

1.22 Administrative Procedure and Contractual Responsibility

Wherever within the Specification it is mentioned or implied that the Contractor shall deal direct with the Employer or Engineer, it shall mean “through the Project Manager 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 Contractor but the value thereof shall be deducted from the Contract Sum and the value of the work ordered by the Engineer and executed there under shall be measured and valued by the Engineer in accordance with the conditions of the Contract.

All work liable to adjustment under this 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 Contractor shall give notice to the Quantity Surveyor or Engineer to carry out measurements before covering up. If the Contractor shall make default in these respects he shall, if the Engineer so directs, uncover the work to enable the necessary measurements to be taken and afterwards reinstate at his own expense.

1.24 Contractor's Office in Kenya

The 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 Contract Works.

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

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

The 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 Contract Works or otherwise.

1.25 Builder's Work

All chasing, cutting away and making good will be done by the Contractor. The Contractor shall mark out in advance and shall be responsible for accuracy of the size and position of all holes and chases required.

The 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 be provided and installed by the Contractor.

1.26 Structural Provision for the Works

Preliminary major structural provision has been made for the 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 Contractor stated otherwise when submitting his tender.

Any major structural provision or alteration to major structural provisions required by the 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 works.

1.27 Position of Services, Plant, Equipment, Fittings and Apparatus

The 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 Contractor.

Services through 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 in this respect, shall be the Sub-contractor's responsibility.

The Sub-contractor shall be deemed to have allowed in his 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 Contract Drawings. Within these limits no variations in the Contract Sum will be made unless the work has already been executed in accordance with previously approved Working Drawings and with the approval of the Engineer.

1.28 Checking of Work

The Contractor shall satisfy himself to the correctness of the connections he makes to all items of equipment supplied under the Contract agreement and equipment supplied under other 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 Contractor shall carry out such tests of the Contract Works as required by British Standard 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 (Contractor's own preliminary and proving tests exempted).

It will be deemed that the Contractor has included in the Contract Sum for the costs of all fuel, power, water and the like, for testing and commissioning as required as part of the 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 Contractor shall commission the Contract Works and provide attendance during the commissioning of all services, plant and apparatus connected under the 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 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 Contract Works.

1.30 Identification of Plant Components

The 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 Contract Drawings

The 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 Contract works.

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

If the Contractor requires any further instructions, details, Contract Drawings or information drawings to enable him to prepare his Working Drawings or proposals, the 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 Contractor to ensure that the installations shown on the Working Drawings have been cleared with the Project Manager and any other Sub-contractors whose installations and works might be affected.

If the Contractor submits his Working Drawings to the Engineer without first liaising and obtaining clearance for his installations from the Project Manager 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, 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 Contractor shall include but not be restricted to the following:

Any drawings required by the 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 pipe work ducting below or above ground or in or outside or below buildings.

General Arrangement Drawings of all plant, control boards, fittings and apparatus or any part thereof and for installation layout arrangement of such plant and apparatus.

Schematic Layout Drawings of services and of control equipment.

Layout Drawings of all embedded and non-embedded pipe work, ducts and electrical conduits.

Complete circuit drawings of the equipment, together with associated circuit description.

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 Contractor indicating approval or amendment therein.

Six copies of the approved Working Drawings shall be given to the Project Manager 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 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 Contractor shall ensure that the Working Drawings are submitted to the Engineer 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 Contractor of his obligation to complete the Contract Works within the agreed Contract Period and in a manner that would receive the approval of the Engineer.

1.33 Record Drawings (As Installed) and Instructions

During the execution of the Contract Works the 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 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 Contractor as a correct record of the installation of the Contract Works.

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

- a. 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.
- b. Fully dimensioned drawings of all plants and apparatus.
- c. General arrangement drawings of equipment, other areas containing plants forming part of the Contract Works and the like, indicating the accurate size and location of the plant and apparatus suitably cross-referenced to the drawings mentioned in (b) above and hereinafter.
- d. Routes, types, sizes and arrangement of all pipe work and duct work including dates of installation of underground pipe work.
- e. Relay adjustment charts and manuals.
- f. Routes, types, sizes and arrangement of all electric cables, conduits, ducts and wiring including the dates of installation of buried works.
- g. System schematic and trunking diagrams showing all salient information relating to control and instrumentation.
- h. Grading Charts.
- i. Valve schedules and locations suitability cross-referenced.

- j. Wiring and piping diagrams of plant and apparatus.
- k. 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.

Operating Instruction

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

Marked-up drawings of the installation of the Contract Works shall be kept to date and completed by the date of practical or section completion. Two copies of the Record Drawings of 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 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 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 Contractor's obligations referred to above, if the Contractor fails to produce to the Engineer's approval, either:-

The Marked-up Drawings during the execution of the Contract Works or

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 Contractor.

1.34 Maintenance Manual

Upon Practical Completion of the Contract Works, the Contractor shall furnish the Engineer four copies of a Maintenance Manual relating to the installation forming part of all of the 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 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 Contract Works the following and any other items listed in the text of the Specifications:

System Description:

Plant

Valve Operation

Switch Operation

Procedure of Fault Finding

Emergency Procedures

Lubrication Requirements

Maintenance and Servicing Periods and Procedures

Colour Coding Legend for all Services

Schematic and Wiring Diagrams of Plant and Apparatus

Record Drawings, true to scale, folded to International A4 size

Lists of Primary and Secondary Spares:

The manual is to be specially prepared for the 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 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 Contract Works shall be considered complete and the Maintenance and Defects Liability Period shall commence only when the 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.

The procedure to be followed will be as follows:

On the completion of the Contract Works to the satisfaction of the Engineer and the Employer, the Contractor shall request the Engineer, at site to arrange for handing over.

The Engineer shall arrange a Hand-over Meeting or a series thereof, at site.

The 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.

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 Contractor allowed for all protective and finish painting in the Contract Sum for the 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 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 Contractor shall give two week's 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 Contractor's own risk and should the test certificate not be approved new tests may be ordered by the Engineer at the 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 -Installation

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

1.40 Labour Camps

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

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

If practicable, W.C. accommodation shall be allocated for the sole use of the 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 Contractor shall provide storerooms and workshop where required. He shall also provide space for storage to nominated sub-contractors who shall be responsible for these lock-up shades or stores provided.

Nominated Sub-contractors are to be made liable for the cost of any storage accommodation provided specially for their use. No materials shall be stored or stacked on suspended slabs without the prior approval of the Project manager.

1.42 Initial Maintenance

The 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 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 Contractor shall allow in the 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 the Initial Maintenance

The 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 1.41 (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 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 Contractor who shall be liable for the cost of any water or electric current used and for any installation provided especially for his own use.

1.46 Protection

The 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 Contract.

1.47 Defects After Completion

The defects liability period will be 6 months from the date of practical completion of the Works in the Contract and certified by the Engineer.

1.48 Damages for Delay

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

1.49 Clear Away on Completion

The 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 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 contract.

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

1.51 Fair Wages

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

The Contractor shall pay rates of the wages and observe hours and conditions of labour not less favorable than those established for the trade or industry in the district where work is carried out.

In the absence of any rates of wages, hours or conditions of labour so established the 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 Contractor is engaged are similar.

1.52 Supervision

During the progress of the works, the Contractor shall provide and keep constantly available for consultation on site 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 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 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 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 Contractor shall provide skilled and unskilled labour as may be necessary for completion of the contract.

1.55 Discount to the Main Contractor

No discount to any Sub-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 six 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 Contracts

Notwithstanding the foregoing conditions, the Government reserves the right to place a "Direct Contract" for any goods or services required in the works which are covered by a P.C Sum in the Bills of Quantities and to pay for the same direct. In any such 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 Contractor shall allow for the attendance of trade upon trade and shall afford any tradesmen or other persons employed for the execution of any work not included in this contract every facility for carrying out their work and also for the use of ordinary scaffolding. The contractor however, shall not be required to erect any special scaffolding for them.

1.59 Trade Unions

The 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 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 Government 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 contract sum or stated by way of provisional sum shall be added to the contract sum.

The contractor before making any variation from the 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 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 contract.

1.61. Assignment or subletting

The contractor shall not without the written consent of the Project Manager assigns this contract or sublet any portion of the works, provided that such consent shall not be unreasonably withheld to the prejudice of the contractor.

1.62 Partial Completion

If the Government shall take over any part or parts works, apparatus, equipment etc. then within seven days from the date on which the Government 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 Defects Liability Period in respect of the relevant part be deemed to have commenced on the date Government shall have taken possession thereof.

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

The contractor shall reduce the value of insurance by the full value of the relevant part

The contractor shall be paid for the part of works taken possession by the Government

1.63 Temporary Works

Where temporary works shall be deemed necessary, such as Temporary lighting, the contractor shall take precaution to prevent damage to such works.

The 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 contract

1.64. Patent Rights

The contractor shall fully indemnify the Government of Kenya; 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 contractor to the Project Manager. In like manner the Government of Kenya shall fully indemnify the 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 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 contractor from liability should he manufacture for supply to other buyers.

1.65 Mobilization and Demobilization

The 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 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 contract period by the Project manager the contractor shall still ensure availability on site, optimum labour, materials, plant and equipment. The contractor shall make provision for extended preliminaries, should the contract period be extended and this shall be in a form of a percentage of the total Contractor works. Where called upon in the Appendix to these Preliminaries the 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 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 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 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 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 contractor.

1.68 Amendment to Scope of 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 contract period and as the works progress the Project Manager may vary the works as per conditions of 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 1.70)

1.69 Contractor Obligation and Employers Obligation

The sub-contractor will finance all activities as part of his obligation to this contract. The employer shall pay interim payment for materials and work completed on site as his obligation in this 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 Contractor, except as relates to late payment as in the conditions of contract clause 23.3. The 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 contract sum in the Appendix to this section.

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

1 ADD TO CLAUSE 1.40

There are no labour camps.

2 ADD TO CLAUSE 1.17

Prices quoted shall include 16% VAT. In accordance with Government policy, the 16% 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).

3. ADD TO CLAUSE 1.66

The amount or percentage that may be inserted in the bills of quantities for this item should not exceed the anticipated Liquidated damages amount for the same period.

4 OMIT CLAUSE 1.12

SECTION D

GENERAL MECHANICAL SPECIFICATIONS

SECTION D

GENERAL MECHANICAL SPECIFICATION

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SECTION D

GENERAL MECHANICAL SPECIFICATION

2.01 General

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

2.02 Quality of Materials

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

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

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

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

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

2.03 Regulations and Standards

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

- a) The Kenya Government Regulations.
- b) The United Kingdom Institution of Electrical Engineers (IEE) Regulations for the Electrical Equipment of Buildings.
- a) 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

2.04 Electrical Requirements

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

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

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

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

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

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

2.05 Transport and Storage

All plant and equipment shall, during transportation be suitably packed, crated and protected to minimise the possibility of damage and to prevent corrosion or other deterioration.

On arrival at site all plant and equipment shall be examined and any damage to parts and protective priming coats made good before storage or installation.

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

Prior to installation all piping and equipment shall be thoroughly cleaned.

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

2.06 Site Supervision

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

2.07 Installation

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

2.08 Testing

2.08.1 General

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

2.08.2 Material Tests

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

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

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

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

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

2.08.3 Manufactured Plant and Equipment – Work Tests

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

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

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

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

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

2.08.4 Pressure Testing

All 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.

2.09 Colour Coding

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

2.10 Welding

2.10.1 Preparation

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

2.10.2 Method

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

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

2.10.3 Welding Code and Construction

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

a) Pipe Welding

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

b) General Welding

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

2.10.4 Welders Qualifications

Any welder employed on this Sub-contractor shall have passed the trade tests as laid down by the Government of Kenya.

The Engineer may require to see the appropriate certificate obtained by any welder and should it be proved that the welder does not have the necessary qualifications the Engineer may instruct the Sub- contractor to replace him by a qualified welder.

SECTION E

PARTICULAR PLUMBING AND DRAINAGE

SPECIFICATIONS

SECTION E

**PARTICULAR PLUMBING AND DRAINAGE
SPECIFICATIONS**

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SECTION E

PARTICULAR PLUMBING AND DRAINAGE SPECIFICATIONS

5.1 GENERAL

This section specifies the general requirements for plant, equipment and materials forming part of the plumbing and drainage installations.

5.2 MATERIALS AND STANDARDS

5.2.1 Pipework and Fittings

Pipework materials are to be used as follows:

a) Galvanized Steel Pipework

Galvanized steel pipe work up to 65mm nominal bore shall be manufactured in accordance with B.S. 1387 Medium Grade, with tapered pipe threads in accordance with B.S. 21. All fittings shall be malleable iron and manufactured in accordance with B.S. 143.

Pipe joints shall be screwed and socketed and sufficient coupling unions shall be allowed so that, fittings can be disconnected without cutting the pipe. Running nipples and long screws shall not be permitted unless exceptionally approved by the Engineer.

Galvanized steel pipe work, 80mm nominal bore up to 150mm nominal bore shall be manufactured to comply in all respects with the specification for 65mm pipe, except that screwed and bolted flanges shall replace unions and couplings for the jointing of pipes to valves and other items of plant. All flanges shall comply with the requirements of B.S. 10 to the relevant classifications contained hereinafter under Section 'C' of the Specification.

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

b) PP -R Pipework

PP-R pipe work up to 63mm nominal bore shall be manufactured in accordance with the current European standards i.e DIN 8077 and DIN 8078 for PN 20 tubing, with metallic joints to DIN 8076, joints and fittings for tubing to DIN 16962. All threaded inserts in the fittings and joints shall be made of nickel brass OT58 and are turned from bars and manufactured in accordance with DVGW 534E.

Pipe joints shall be screwed and socketed and sufficient coupling unions shall be allowed so that, fittings can be disconnected without cutting the pipe. Running nipples and long screws shall not be permitted unless exceptionally approved by the Engineer.

c) Copper Tubing

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

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

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

If, as may occur in certain circumstances, it is not possible to make the connection in any way than the use of copper tubing, then a brass straight connector shall be positioned between the galvanized pipe and the copper tube in order to prevent direct contact.

d) **P.V.C. (Hard) Pressure Pipes and Fittings**

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

Jointing

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

Testing

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

e) **A.B.S. Waste System**

Where indicated on the Drawings and Schedules, the Sub-contractor shall supply and fix A.B.S. waste pipes and fittings.

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

Jointing of pipes shall be carried out by means of solvent welding, the manufacturer's instructions and B.S. 5572: 1978.

Jointing of pipes shall be carried out by means of solvent welding. The manufacturer's recommended method of joint preparation and fixing shall be followed.

Standard brackets, as supplied for use with this system, shall be used wherever possible. Where the building structure renders this impracticable the Sub-contractor shall provide purpose made supports, centers of which shall not exceed one meter.

Expansion joints shall be provided as indicated. Supporting brackets and pipe clips shall be fixed on each side of these joints.

e) **PVC Soil System**

The Sub-contractor shall supply and fix PVC soil pipes and fittings as indicated on the Drawings and Schedules.

Pipes and fittings shall be in accordance with relevant British Standards, including B.S. 4514 and fixed to the manufacturer's instructions and B.S. 5572.

The soil system shall incorporate synthetic rubber gaskets as provided by the manufacturer whose fixing instructions shall be strictly adhere to.

Connections to WC pans shall be effected by the use of a WC connector; gasket and cover fixed to suit pan outlet.

Suitable supporting brackets and pipe clips shall be provided at maximum of one-meter centers.

The Sub-contractor shall be responsible for the joint into the Gully Trap on Drain as indicated on the Drawings.

5.2.2 **Valves**

a) **Draw-off Taps and Stop Valves (Up to 50mm Nominal Bore)**

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

b) **Gate Valves**

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

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

The pressure classification of all valves shall depend upon the pressure conditions pertaining to the site of works.

c) Globe Valves

All globe valves up to and including 65mm nominal bore shall be of bronze construction in accordance with the requirements of B.S.3061.

The pressure classification of all globe valves shall depend upon the pressure conditions pertaining to the site of works.

5.2.3 Waste Fitment Traps

a) Standard and Deep Seal P & S Traps

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

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

b) Anti-Syphon Traps

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

The trade name for traps manufactured by this company is 'Grevak'.

5.2.4 Pipe Supports

a) General

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

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

Consideration shall be given, when designing supports, to the maintenance of desired pipe falls and the restraining of pipe movements to a longitudinal axial direction only.

The Sub-contractor shall supply and install all steelwork forming part of the pipe support assemblies and shall be responsible for making good damage to builders work associated with the pipe support installation.

The Sub-contractor shall submit all his proposals for pipe supports to the Engineer for approval before any erection works commence.

b) Steel and Copper Pipes and Tubes

Pipe runs shall be secured by clips connected to pipe angers, wall brackets, or trapeze type supports. 'U' bolts shall not be used as a substitute for pipe clips without the prior approval of the Engineer.

An approximate guide to the maximum permissible supports spacing in meters for steel and copper pipe and tube is given in the following table for horizontal runs.

Size Nominal Bores	Steel Tube to B.S. 659	Copper Tube to B.S. 1387
15mm	1.25m	2.0m
20mm	2.0m	2.5m
25mm	2.0m	2.5m
32mm	2.5m	3.0m
40mm	2.5m	3.0m
50mm	2.5m	3.0m
65mm	3.0m	3.5m
80mm	3.0m	3.5m
100mm	3.0m	4.0m
125mm	3.0m	4.5m
150mm	3.5m	4.5m

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

c) Expansion Joints and Anchors

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

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

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

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

5.2.5 Sanitary Appliances

All sanitary appliances supplied and installed as part of the Sub-contract works shall comply with the general requirements of B.S. Code of Practice 305 and the particular requirements of the latest B.S. Specifications.

5.2.6 Pipe Sleeves

Main runs of pipework are to be fitted with sleeves where they pass through walls and floors. Generally the sleeves shall be of P.V.C. except where they pass through the structure, where they shall be mild steel. The sleeves shall have 6mm – 12mm clearance all around the pipe or for insulated pipework all around the installation. The sleeve will then be packed with slag wool or similar.

5.3 INSTALLATION

5.3.1 General

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

5.3.2 Above Ground Installation

a) Water Services

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

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

All water systems shall be provided with sufficient drain points and automatic air vents to enable them to function correctly.

Valves and other user equipment shall be installed with adequate access for operation and maintenance. Where valves and other operational equipment are unavoidably installed beyond normal reach or in such position as to be difficult to reach from a small stepladder, extension spindles with floor or wall pedestals shall be provided.

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

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

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

The test pressure shall be maintained by the pump for about one hour and if there is any leakage, it shall be measured by the quantity of water pumped into the main in that time.

A general leakage of 4.5 Litres per 25mm of diameter, per 1.6 kilometers per 24 hours per 30 meters head, may be considered reasonable but any visible individual leak shall be repaired.

b) Sanitary Services

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

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

The Sub-contractor shall provide all necessary rodding and inspection facilities within the draining system in positions where easy accessibility is available.

Where a branch requires rodding facilities in a position to which normal access is unobtainable, then that branch shall be extended so as to provide a suitable purpose made rodding eye in the nearest adjacent wall or floor to which easy access is available.

The vent stacks shall terminate above roof level and where stack passes through roof, a weather skirt shall be provided. The Sub-contractor shall be responsible for sealing the roof after installation of the stacks.

The open end of each stack shall be fitted with a plastic coated or galvanized 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.

5.4 TESTING AND INSPECTION

5.4.1 Site Tests – Pipework Systems

a) Above Ground Internal Water Services Installation

All water service pipe system installed above ground shall be tested hydraulically for a period of one hour to not less than one and half times to design working pressure.

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

During the test, each branch and joint shall be examined carefully for leaks and any defects revealed shall be made good by the Sub-contractor and the section re-tested.

The Sub-contractor shall take all necessary precautions to prevent damage occurring to special valves and fittings during the tests. Any item damaged shall be repaired or replaced at the Sub-contractor's expenses.

b) Above Ground Soil Waste and Ventilation System

All soil, waste and ventilating pipe system forming part of the above ground installation, shall be given appropriate test procedures as described in B.S. 5572, 1972.

Smoke tests on above ground soil, waste and ventilating pipe system shall not be permitted.

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

In all respects, tests shall comply with the requirements of B.S. 5572.

5.4.2 Site Test – Performance

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

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

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

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

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

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

The test pressure shall be applied by means of a manually operated test pump or, in the case of long main or mains of large diameter, by a power driven test pump which shall not be left unattended. In either case precautions shall be taken to ensure that the required pressure is not exceeded.

Pressure gauges should be recalibrated before the tests.

The Sub-contractor shall be deemed to have included in his price for all test pumps, and other equipment required under this specification.

The test pressure shall be one and a half times the maximum working pressure except where a pipe is manufactured from a material for which the relevant B.S. specification designates a maximum test pressure.

5.5 **STERILISATION OF COLD WATER SYSTEM**

All water distribution system 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 in accordance with the requirements of B.S. Code of Practice 301, Clause 409 and to the approval of the Engineer.

SECTION- F

PARTICULAR SPECIFICATION

FOR

PORTABLE FIRE EXTINGUISHER AND

HOSE REEL

INSTALLATIONS

SECTION- F

PARTICULAR SPECIFICATION

FOR

PORTABLE FIRE EXTINGUISHER AND HOSE REEL

INSTALLATIONS

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SECTION- F

PARTICULAR SPECIFICATIONS FOR PORTABLE FIRE EXTINGUISHER

6.1 GENERAL

The particular specification details the requirements for the supply and installation and commissioning of the Portable Fire Extinguishers and Boosted Hose Reel System. The Sub-contractor shall include for all appurtenances and appliances not necessarily called for in this specification or shown on the contract drawings but which are necessary for the completion and satisfactory functioning of the works.

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

6.2 SCOPE OF WORKS

The Sub-contractor shall supply, deliver, erect, test and commission all the portable fire extinguishers and Hose Reel which are called for in these Specifications and as shown on the Contract Drawings.

6.3 WATER/CO₂ EXTINGUISHERS

These shall be 9-litre water filled CO₂ cartridge operated portable fire extinguishers and shall comply with B.S. EN 3/BS 1449 and to the requirements of B.S.1004. Unless manufactured with stainless steel, bodies shall have all internal surfaces completely coated with either a lead tin, lead alloy or zinc applied by hot dipping. There shall be no visibly uncoated areas.

The extinguishers shall be clearly marked with the following:

- a) Method of operation.
- b) The words 'WATER TYPE' (GAS PRESSURE) in prominent letters.
- c) Name and address of the manufacturer or responsible vendor.
- d) The nominal charge of the liquid in imperial gallons and litres.
- e) The liquid level to which the extinguisher is to be charged.
- f) The year of manufacture.
- g) A declaration to the effect that the extinguisher has been tested to a pressure of 24.1 bar (350 p.s.i.).
- h) The number of British Standard 'B.S' 1004 or B.S. 1449.

6.4 PORTABLE CARBON DIOXIDE FIRE EXTINGUISHERS

These shall be portable carbon dioxide fire extinguishers and shall comply with B.S. EN 3/BS 1449 and B.S. 1004.

The body of extinguisher shall be a seamless steel cylinder manufactured to one of the following British Standards; B.S. 401 or B.S. 1288.

The filling ratio shall comply with B.S. 5355 with valve fittings for compressed gas cylinders to B.S.341. Where a hose is fitted it shall be flexible and have a minimum working pressure of 206.85 bar (3000 p.s.i.). The hose is not to be under internal pressure until the extinguisher is operated.

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

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

The following markings shall be applied to the extinguishers:-

- a) The words "Carbon Dioxide Fire Extinguisher" and to include the appropriate nominal gas content.
- b) Method of operation.
- c) The words "Re-charge immediately after use".
- d) Instructions for periodic checking.
- e) The number of the British Standard B.S. 3326: 1960 or B.S. 5423.
- f) The manufacturers name or identification markings

6.5 DRY CHEMICAL POWDER PORTABLE FIRE EXTINGUISHER

The portable dry powder fire extinguishers shall comply with BS EN 3/BS 1449 and BS 1004. The body shall be constructed to steel not less than the requirements of BS 1449 or aluminium to BS 1470: 1972 and shall be suitably protected against corrosion.

The dry powder charge shall be 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 1,060mm and shall be acid and alkali resistant. Provision shall be made for securing the nozzle when not in use.

The extinguisher shall be clearly marked with the following information

- a) The word "Dry Powder Fire Extinguisher"
- b) Method of operation in prominent letters.
- c) The working pressure and the weight of the powder charge in Kilogrammes.
- d) Manufacturers name or identification mark
- e) The words "RECHARGE AFTER USE" if rechargeable type.
- f) Instructions to regularly check the weight of the pressure container (gas Cartridge) or inspect the pressure indicator on stored pressure types when fitted, and remedy any loss indicated by either.
- g) The year of manufacture.
- h) The Pressure to which the extinguisher was tested.
- i) The number of this British Standard BS 3465 or BS 5423: 1977.
- j) When appropriate complete instructions for charging the extinguisher shall be clearly marked on the extinguisher or otherwise be supplied with the refill.

6.6 AIR FOAM FIRE EXTINGUISHER

These shall be of 9 litres capacity complete with refills cartridges and wall fixing brackets and complying with B.S. EN 3/BS 1449 and BS 1004 with the following specifications: -

Cylinder: to **B.S. 1449**

Necking: to be 76mm outside diameter steel EN 3A 2³/₄ X 8TPI female thread.

Head cap: to be plastic moulding acetyl resin.

CO2 Cylinder: to be 75gm P.V.C coated.

Internal Finish: to be polythene lining on phosphate coating.

External finish: to be phosphated - One coat primer paint and one coat stove enamel B.S 381 C.

6.7 FIRE BLANKET

The fire blanket shall be made from cloth woven with pre-asbestos yarn or any other fire proof material and to measure 1800 x 1210 mm and shall be fitted with special tapes folded so as to offer instantaneous single action to release blanket from storing jacket to BS 1721.

6.8 BOOSTED HOSE REEL SYSTEM

6.8.1 General

The Particular Specification details the requirements for the supply, installation and commissioning of the hose reel installation. The hose reel installation shall comply in all respects to the requirements set out in C.O.P 5306 Part 1: 1976, B.S 5041 and B.S 5274. The System shall comprise of a pumped system.

6.8.2 Hose Reel Pumps

The fire hose reel pumps shall consist of a duplicate set of multi-line centrifugal pumps from approved manufacturers. The pumps shall be capable of delivering 0.76 lit/sec at a running pressure of 2 bars.

The pump casing shall be of cast iron construction with the impeller shaft of stainless steel with mechanical seal.

6.8.3 Control Panel

The control panel shall be constructed of mild steel 1.0mm thick sheet, be moisture, insect and rodent proof and shall be provided complete with circuit breakers and a wiring diagram enclosed in plastic laminate.

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

- (a) 'On' push button for setting the control panel to live.
- (b) Green indicator light for indicating control panel live.
- (c) Duty / Stand-by pump auto change over.
- (d) Duty pump runs green indicator light.
- (e) Stand-by pump run green indicator light.
- (f) Duty pump fails red indicator light.
- (g) Stand-by pump fails red indicator light.
- (h) Low water condition pumps cutout with red indicator light.

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

6.8.4 Hose Reel

The hose reel to the installation shall consist of a recessed, swing-type hose reel as Angus Fire Armour Model III or from other approved manufacturers.

The hose reel shall comply with B.S. 5274: 1975 and B.S 3161: 1970 and is to be installed to the requirements of C.P. 5306 Part 1: 1976.

The hose reel shall be supplied and installed complete with a first-aid non-kinking hose 30 meters long with a nylon spray / jet / shut-off nozzle fitted. A screw down chrome - plated globe valve to B.S 1010 to the inlet to the reel is to be supplied.

The orifice to the nozzle is to be not less than 4.8mm to maintain a minimum flow of 0.4 lit / sec to jet.

The hose reels shall be installed at 1.5 meters centre above the finished floor level in locations shown in the contract drawings.

6.8.5 Pipe Work

The pipe work for the hose reel installation shall be galvanized wrought steel tubing heavy grade Class C to B.S 1387: 1967 with pipe threads to B.S 21.

6.8.6 Pipe Fittings

The pipe fittings shall be wrought steel pipe fittings, welded or seamless fittings conforming to B.S. 1740 or malleable iron fittings to B.S 143.

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

6.8.7 Non-return Valves

The non-return valves up to and including 80mm diameter shall be to B.S. 5153: 1974.

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

6.8.8 Gate Valves

The gate valves up to and including 80mm diameter shall be non-rising stem and wedge disc to B.S 5154: 1974 with screwed threads to B.S. 21 tapes thread

6.8.9 Sleeves

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

6.8.10 Earthing

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

6.8.11 Finish Painting

Upon completion of testing and commissioning the hose reel installation, the pipe work shall be primed and finish painted with 2 No. coats of paints to the Engineer's requirements.

6.8.12 Testing and Commissioning

The hose reel installation shall be flushed out before testing to ensure that no builder's debris has entered the system. The installation is to be then tested to one and half times the working pressure of the installation to the approval of the Engineer. Simulated fault conditions of the pumping equipment are to be carried out before acceptance of the System by the Engineer.

6.8.13 Instruction Period

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

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

4.08 FIRE HYDRANT DETAILS

(a) Hydrant body

The body of the hydrant shall be made of grey cast iron complying with the requirements of BS 750 having a tensile strength not less than that given for grade 14.

(b) Hydrant Valve

The valve shall be faced with suitable resilient material. The threaded part of the valve, which engages with the spindle, shall be of bronze.

Body seating for the valves shall be of copper alloy complying with the requirements of BS 750, or high tensile brass complying with the requirements

of BS 2872 or BS 2874.

Turning the spindle cap in a clockwise direction when viewed from above shall

close valves and the direction of opening shall be permanently marked on the gland.

(c) Spindle & Spindle Cap

The spindle nut shall be either of the same material as the spindle, or of copper alloy complying with the requirements of BS/1400 either type LG 2 or type LG 4. It shall have a squared top formed to receive either a cast iron spindle cap.

The spindle shall be made of copper alloy complying with the requirements of BS 2874, either type CZ114 or type CZ115, and it shall have a threaded machined of trapezoidal form.

The spindle cap shall be of a cast iron secured to the spindle by one M12 hexagon socket set screw conforming to BS 4168.

(d) Hydrant outlet

The outlet flange of the hydrant shall have a nominal diameter 65mm, and shall be fitted with a screwed outlet – Both flanges shall be 50 mm conforming to BS 750

The screwed outlet shall be provided with a cap of cast iron or other suitable material.

The cap shall cover the outlet thread completely and shall be attached to the hydrant by a chain

The distance between the axis of the outlet and the nearest point on the spindle

fitting shall be not less than 100 mm. The screwed outlet shall be made of Copper alloy to BS 1400, type LG2G or DC BIC or Copper alloy to BS 2872, type CZ114 or CZ115, or Suitable spheroidal graphite iron to BS 2789 protected against corrosion accordance with CP 2008.

(e) Drain Boss

Each shall be provided with a suitable drain boss on the outlet side. This shall be located at the lowest practical point, which will permit the filling of self-operating a drilled drip plug.

(f) Jointing

The hydrants shall have machined joint faces through out and the fitting of adjoining parts shall be Such as to make sound joints, corresponding parts of hydrants of the same design and manufacture shall be interchangeable.

(g) Hydrant coating

The hydrant shall be coated in accordance to BS. 4164.

(h) Surface Box.

The clear opening of hydrant surface boxes at ground level shall not be less than 250mm x 380mm

The depth of frame shall normally be for boxes located on footpaths: 100mm for boxes located in roads: 125mm

(i) Markings

Surface box covers shall be clearly marked by having the words FIRE HYDRANT'

in letter not less than 30mm high, or the initials F.H.' in letters not less than 75mm high high cost into the cover.

(j) Surface Box Covers & Frames.

The surface box frames and covers shall be graded in accordance with 2.1. of BS 497:1967 and shall meet the loading test requirement also given in BS 497

(k) Testing

The hydrants shall be deemed to have undergone the necessary hydrostatic and flow test at time of manufacture Necessary test certificates from the manufacturer shall be needed. The test, to conform to BS 750: 1977: Appendix a.1

4.09 STAND PIPES

One end of these shall have internal threads to couple with the 80mm diameter external threads of the screw down type fire Hydrant (BS750 type 2 hydrants) outlet. The other shall have 65mm diameter internal threads to couple with the interconnect or hose of the pump set

4.11 HOSE PIPE

Each cotton synthetic fibre rubberised fire hosepipe to be 25 metres long with 65mm diameter female instantaneous type connector.

SECTION G:
STANDARD SPECIFICATIONS FOR MECHANICAL
VENTILATION AND AIR CONDITIONING SYSTEMS

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GENERAL SPECIFICATION FOR MECHANICAL VENTILATION SYSTEM

1.SCOPE OF WORK

The scope of the works comprises Installation, Testing and Commissioning of Mechanical Ventilation and Air Conditioning systems in accordance with Specifications and drawings. All the necessary elements and details for complete system are to be included.

Excluded from the specifications are the following:-

A) All concrete works

B) All block work

c) Electrical wiring, isolators and switch boards, except internal wiring for control system from a local isolator

2. SYSTEM COMPONENTS

Dimensions and capacities of ducts and fans are calculated and based on a specific requirements of air, and on an assumed resistance through grilles, silencers, etc. However the installer shall be responsible for the correct functioning of the system. Subsequently it is therefore his duty to size the systems' components with consideration to his offered equipment

3. DRAWINGS

The Engineer's drawings show the main layout and principles for the ventilation and Air Conditioning Systems. If need for further detailing is required in order to carry out the work, working drawings and details shall be produced for approval by the Engineer before the work is executed.

In preparation of the working drawings care should be taken to coordinate the Ventilation and Air Conditioning works with other services involved and avoid any interference with these.

4. MATERIALS AND GENERAL WORKMANSHIP

In the specification, equipment is generally described according to capacities and a given standard in order to aid in identification of the particular equipment to satisfy specifications. The equipment selected shall be of reputable manufacture with adequate Back-Up service.

If the Engineer finds it necessary, samples of the materials will be submitted for approval before placing an order. The Engineer shall reject any materials which he finds to be of unsatisfactory quality.

Works shall be carried out by competent workmen under experienced supervision

The Engineer shall have the authority to have any substandard work or equipment redone and/or equipment replaced

5. GENERAL DUCTWORK

5.1 Ductwork

All seams, joints and connections to plant shall be so made as to reduced air leakage to a minimum. Internal roughness and obstructions to airflow will not be accepted. Sharp edges or corners on the outside of ductwork, flanges, supports, etc will not be accepted. Any part of galvanized ductwork where the galvanizing is damaged during manufacture or erection shall be painted with two coats of aluminium, zinc or other erosion-resisting paint to the approval of the Engineer.

Where ducts pass through roofs (and external walls where applicable) these shall be fitted with angle flanges and weather cravats to ensure a weather-proof fitting to the building structure.

Connections to equipment shall be made with angle flanged joints. Ductwork which may have to be moved to enable plant to be removed shall incorporate angle flanged joints. For long duct runs, angle flanged shall be included at intervals to facilitate any subsequent alternations.

Bends and offsets shall have a minimum throat radius equal to the width of duct. Where short radius elbows are indicated or agreed by the Engineer as necessary due to site limitations the dimensions and internal vane(s) shall be in accordance with HVAC publication DW/121

Ductwork shall be constructed by galvanized, cold rolled, close annealed patent flattened sheets. Test holes shall be provided in branch ducts from grilles and there shall be three or four tests holes on size of duct according to duct depth at each test position. At branch positions shall be one test hole. Air tight swivel type metal covers shall be fitted over the test holes in such a manner that they shall be readily removed as required.

5.2 Rectangular ductwork

Construction of ductwork shall be as per the following Guidelines:

- i) Up to 300mm longer side-22 S.W.G
- ii) Over 300mm and up to 460mm longer size-20 S.W.G
- iii) Over 460mm and up to 900mm longer side 18 S.W.G(stiffening to be 25mm x 25mm x 3mm.M.S. angle at slip joints at 180mm spacing)
- iv) Over 900mm and up to 1370mm longer side 16 S.W.G(stiffening to be 30mm x 30mm x 3mm M.S.angle at 900mm spacing)
- v) Over 1370mm longer side-14 S.W.G(Stiffening to be 40mm x 40mm x 5mm M.S.angle at 900mm spacing)

Ductwork constructed from 22 and 20 S.W.G. sheet shall have folded locked seams and ductwork constructed from 18,16 and 14 S.W.G. sheets shall have a riveted seam with 8 S.W.G. rivets at 2'' pinch.

Joints for ductwork having a side greater in width than 610mm shall be flanged by means of 30mm x 30mm x 3mm mild steel angles.

Airtight access doors shall be provided on the ductwork wherever indicated on the drawings.The access door, of sufficiently heavy construction to avoid distortion,complete with handles,shall be secured by brass wing nuts screwed into studs provided,on galvanized mild steel stiffening frames riveted,or bolted to the ductwork.The access doors shall be provided with felt or rubber gaskets to ensure that when closed they are perfectly tight.

The ductwork shall be installed with all joints air tight and adequately stiffened and braced shall have the radius possible with a minimum throat radius of one diameter if possible.Square or miter elbows will only be allowed where shown on the drawings.Turning vanes shall be fitted in square or miter elbows.

Transformer pieces except where situated on fan section shall be constructed so that the angle on any side does not exceed 15degrees celcius to the axis of duct where possible

Branch ducts shall enter main ducts expansion sections where possible.Where branch ducts occur,at taper or transformation pieces,the length of such pieces in the main duct shall be systematically about the axis of the branch.

5.3 Brackets and supports

Supports and brackets for duct works shall be made adjustable for height, specified to ensure support and where practicable shall be fitted at each joint of the ductwork. Vertical ductwork shall be supported at each floor level, horizontal ducts at intervals not exceeding 2280mm and adjacent to fans, canvas joints and other equipment. All members of supports in contact with metal ductwork shall be galvanized after fabrication.

Socketed joints shall have a minimum overlap of 50mm in the direction of flow. The joint shall be made with an approved type jointing compound with bolts or rivets at centres not exceeding 50mm. Wherever access cannot be made for riveting or bolting self tapping screw of the shortest length which will give a satisfactory joint shall be used in lieu of the rivets or bolts, on size or diameters up to 530mm.

All slip joints on circular ductwork are to have a spigot carefully swaged damper leaves shall be multi leaf type. The quadrants shall be of robust construction and securely fixed to the ductwork. The leaves shall be linked with a connecting rod and the ends of the spindle shall be housed in bearings. Dampers are to indicate the full and the closed positions and are to be marked and then locked after air volume has been set.

5.4 Joints

5.4.1 Flexible Joints

Flexible joints shall be provided on fan inlet and outlet connections and elsewhere on the ductwork where indicated. They shall be over full cross-sectional area of the mating fan inlet or outlet section. The ends of the duct and fan connections shall be in line.

Flexible joints shall consist of, or be protected by, material having a fire penetrating time of at least fifteen minutes when tested in accordance with BS 476 Part 1 Section 3. The material shall be of the grass fire cloth type, canvas or other approved material. The width of joints from metal edge shall not be less than 80mm or more than 250mm.

All flexible joints other than fan inlet connections shall be between flanged ends. The flexible material flange shall be backed by an angle or flat iron flange and the flexible joint flat iron bar used with fan inlets shall not be less than 5mm thick.

5.4.2 Flexible connections

Where flexible connections are indicated or required between rigid ductwork and particular components or items of equipments, the internal diameter of the flexible duct shall be equal to the external diameter of the rigid ductwork and the spigot type. The use of flexible duct between rigid sections of sheet metal ductwork to change direction or plane will not be permitted except where indicated or expressly authorized by the Engineer.

The flexible duct shall have a liner a cover of tough tear-resistant fabric equal in durability and flexibility to glass fibre shall be impregnated and coated with plastics. It shall be reinforced with a bonded galvanized spring steel wire helix or glass fibre cord or equal and shall be bonded to cover to ensure regular convolutions.

Alternatively the flexible duct shall consist of flexible corrugated metal tubing of stainless steel, aluminium, tinplated steel or aluminium coated steel. The metal may be lined on the inside or the outside or both with plastic materials.

The joints to rigid spigots shall be sealed with a brush coat of pipe jointing paste or mastic compound. Ducts up to 150mm diameter shall be secured with a worm drive type hose clip complying with BS 3628. Ducts over 150mm diameter shall be secured with band clip.

The frictional resistance to air flow per unit length of the flexible duct shall not exceed 50% more than frictional resistance per unit length of the galvanized steel ducts of equivalent diameter. The radius ratio R/D for bends shall not be less than 2 where R is the centre line radius and D is the diameter of the flexible duct.

Flexible ducts shall be suitable for an opening temperature range of 18 degrees Celcius to 120 degree Celcius and shall comply with BS 476 Part 1, Section 2, Clause 7 (Clause 1; surface of very low flame spread).

5.5 Finish Painting

Upon completion of the installation and after all tests have been carried out to the satisfaction of the Engineer, the plant, equipment, supports etc. shall be examined and all priming coats damaged during erection made good.

Any plant or equipment, ductwork, etc., which is to be insulated, shall have had the priming paint protection made good before the application of the insulation. After the above procedures have been carried out to the satisfaction of the Engineer, the various surface shall be given the necessary preparation as recommended by the paint and insulation manufacturers and finish painted in colours to be agreed between the Contractor and Engineer, at a later date.

For the purposes of the specification, however, it shall be deemed that the contractor's tender price was based on the identification requirements for the various services detailed in Code of Practice DW/161 Identification of Ductwork as published by the HVAC.

6. AIR INTAKES AND OUTLETS

Unless otherwise indicated fixed louvers on external walls will be fitted at air intake and outlet positions. A galvanized steel wire mesh screen of 20mm diamond mesh at 2mm diameter wire and complete with a frame of galvanized steel rod with securing lugs or of flat iron shall also be fitted on the inner side of the louvers

7. FANS

7.1 General

Fans shall be capable of giving the specified performance when tested in accordance with BS 848. Although estimated values of the resistance to airflow of items of equipment may be indicated, this does not relieve the Contractor of the responsibility for providing fans capable of delivering the required air volume flow through the system.

The make and design of fans shall be approved by the Engineer and evidence supporting noise levels and fan efficiencies shall be provided. Where fans are supplied with noise attenuations, full details of the attenuations shall be given.

Belt driven fans shall be fitted with pulleys suitable for V-belts; pulleys of the taper locktype may be used for drivers upto 30KW output. Alternatively, and in any case above 30KW output, pulleys shall be secured to the fan and the motor shafts by keys fitted into machined keyways. Pulleys shall be keyed to the fan shaft in the overhung position. Keys shall be easily accessible so that they can be withdrawn or tightened and they shall be accurately fitted so that the gib head does not protrude beyond the end of shaft.

Machined bolts, nuts and washers only shall be used for the assembly of fans; all bearing surfaces for the heads of bolts or washers shall be count faced. Holding down bolts for fans and meters shall be square section under the head or be fitted with snugs to prevent them from turning in the fan base plate when the nuts are tightened.

Any fan which is too large or too heavy for safe manhandling shall be provided with eyebolts or other lifting facilities to enable mechanical lifting equipment to be used.

7.2 Axial Flow Fans

Axial flow fans shall be of either the single stage type or the multi-stage contra-rotating type with each impeller mounted on an independent motor. Casing shall be rigidly constructed of mild steel stiffened and braced to obviate drumming and vibration. Cast iron or fabricated steel feet shall be provided where necessary for bolting to the base or supports. Inlet and outlet ducts shall terminate in flanged rings for easy removal.

The length of the fan(s) and motor(s) shall also terminate in flanges in order that the complete section may be removed without disturbing adjacent ductwork. Electrical connections to the motor(s) shall be through an external terminal box secured to the casing. Impellers shall be of steel or aluminium, the blades shall be secured to the hub or the blades and the hub shall be formed in one piece. The hub shall be keyed to a substantial mild steel shaft and the whole statically balanced. Blades shall be of aerofoil section. Shafts shall be carried in two bearings which may be backroller or sleeve type. Lubricators shall be extended to the outside of the casing.

Where axial flow fans are driven by a motor external to the casing the requirements for pulleys and for V-belt drives and guards shall be met. Unless otherwise indicated a guard is not required for any part of a drive which is within the fan casing. An access door of adequate size shall be provided.

Where axial flow fans of the bifurcated type are indicated the motors shall be out of the air stream. Motors may be placed between the two halves of the casing in the external air or may be placed within the fan casing provided that effective ventilation is given to the motor. Where hot gases or vapours are being handled the motor and bearings shall be suitable for operation at the temperature they may experience.

8. DAMPERS

8.1 General

Sufficient dampers shall be provided to regulate and balance the system. Dampers on grills or diffusers shall be used for fine or secondary control. All dampers shall be sufficiently rigid to prevent fluttering. Unless otherwise indicated, the air leakage past dampers in the fully-closed position shall not exceed 5% of maximum design air flow in the duct. All duct dampers except fire dampers and self-closing flaps shall be fitted with locking devices and position indicators. Dampers shall be generally in accordance with the appropriate HVAC Specification.

Each primary control damper shall be fitted with a non-corrodible label stating the actual air flow in metres cubed per second and the cross-sectional area. Alternatively, these figures shall be painted in a visible position on the adjoining ductwork or insulation. The position of the damper as set after final regulation and balancing be indelibly marked on the damper quadrant.

8.2 Butterfly dampers

Butterfly dampers shall each consist of two plate edge seamed, and of the same thickness of material as that from which the associated duct is made, and rigidly fixed to each side of a mild steel operating spindle, the ends of which shall be turned and housed in non-ferrous bearings.

8.3 Bifurcating dampers

Bifurcating dampers shall be of 2mm thick sheet of sizes for sizes up to 450mm square. For larger sizes the thickness shall be as indicated. Damper plates shall be rigidly fixed to square section mild steel spindles the ends of which shall be turned and housed in non-ferrous bearings.

8.4 Multi-leaf dampers

Multi-leaf dampers shall consist of two plates of material of the same thickness as the associated duct and rigidly fixed to each side of an operating spindle, the ends of which shall be housed in brass, nylon, oil impregnated sintered metal, PTFE impregnated or ball bearings. The ends of the spindle shall be linked such that one movement of the operating handle shall move each leaf an equal amount. An inspection door shall be provided adjacent to each multi-leaf damper.

On low velocity systems only, multi-leaf damper blades may be of a single plate, at least 1.6mm thick and suitably stiffened, and the blade linkages may be within the duct. Those dampers shall have bearings and inspection doors as specified above.

8.5 Damper Quadrants and Operating Handles.

Quadrants and operating handles shall be of die-cast aluminium with the words 'OPEN' and 'SHUT' cast on the quadrants. Quadrants shall be securely fixed to the damper spindles and shall be close-fitted in the quadrant hubs to prevent any damper movement when the damper levers are locked.

8.6 Self-closing dampers

Self-closing dampers shall be designed so as to prevent the minimum of resistance to airflow under running conditions, to take up a firm, non-fluctuating position under running condition and to give the tight shut-off when closed. They shall incorporate rubber stops to prevent rattling and to give a tight shut-off when closed. They shall incorporate rubber stops to prevent rattling.

8.7 Sliding dampers

Sliding dampers shall be provided only where indicated. They shall be of 2mm thick sheet steel for size up to 450mm square. For larger sizes the thickness shall be as indicated. They shall run in guides lined with felt.

8.8 Irish type dampers

Irish type dampers may be used in ducting up to 600mm, dia. Or 450mm square. The control shall be on the outside of the damper. The design shall be such that the leaves of the damper can be easily moved for adjustment.

9. GRILLES

9.1 Supply & Return Registers

Supply registers shall be manufactured from high grade, extruded Aluminium sections with lacquered finish and finishing shall be 32mm with beveled edges.

The registers shall have a front set of blades parallel to the short dimension, the blades being at 17mm centres and individually adjustable with opposed blade dampers.

9.2 Extract grilles

Extract grilles shall be similar to the Supply & Registers as described above with the exception that they have only one set of blades parallel to the long dimension.

9.3 Fresh Air Grilles

These shall be manufactured from sheet steel with steel fixing flanges and shall be galvanized after manufacture. An insect screen shall be fixed down stream

9.4 Diffusers

These shall be manufactured from high grade extruded sections with lacquered finish, beveled flanges and removable core. Fixing shall be by self-tapping screws through the duct into the neck of the diffuser.

9.5 Louvres

Discharge and Fresh air Intake louvers shall be manufactured from milds steel and be galvanized after manufacture. A screen shall be fixed to the back louvres.

10. ATTENUATION

10.1 General

Purpose made attenuators and sound absorbing material shall be designed to air flow, have adequate strength and cohesion to resist erosion by air flow and do not produce dust. They shall be free of odour and proof against rot, damp and vermin and shall comply with the requirements as to fire and smoke hazards. Adhesives shall be compatible with the sound absorbent material and should preferably be non-flamable.

Where sound absorbent material and/or special attenuators are indicated they shall either reduce the sound level to the space, due to the equipmen, to the specified value or shall give the specified sound level attenuation over the specified range of frequencies. Purpose made attenuators shall be tested in accordance with HVRA Laboratory Reort No.55 (Code for the measurement of the performance of unit silencers). The insertion loss and generated noise level for each octave band and the pressure loss of the silencer shall b e stated.

Attenuators shall be suitable for internal air pressure of 100N/Meters squared,air stream temps of upto 40 degrees celcius and free from air steam erosion for velocities upto 25m/s.The mineral wool lining shall be rot,vermin and fire proof.Attenuator casing shall be pre-galvanized sheet steel with galvanized pre-drilled flanges.

10.2 Rectangular attenuators

These shall be rectangular in section with splitters forming air passages in parallel.The mineral wool lining shall be resin bonded.

10.3 Circular attenuators

Circular section attenuators will have acentral pod.The mineral wool lining shall be retained by expanded steel.The end flanges shall be match drilled to suit the fan which they are fixed to.

10.4 Acoustic lining

Where indicated on the contract drawings,the ductwork shall be acoustically lined.The lining shall consist of resin bonded mineral wool 25mm,thick fixed to the ductwork by a suitable adhesive.

11.INSTRUMENTS

11.1 General

The instruments,gauges etc ,detailed in this section shall be provided in addition to those associated with specific items of plate and detailed elsewhere,they shall be mounted in accessible positions and shall be easily read.

11.2 System Static Pressure Gauge

A system static pressure gauge shall be provided for the system.It shall consist of a small inclined manometer gauge similar to a filter gauge.The edge of the gauge shall be connected to the system and the other end shall be left open to the plant room but where fluctuation of the static pressure in the plant room may occur the gauge shall be connected across the main fan.Such fluctuations may be caused by wind pressure affecting large open air intakesto the plant room.

12 VIBRATION,NOISE AND SOUND INSULATION

12.1 Anti-Vibration Mountings

Fans,compressors,motors and any other vibraton-inducing equipment shall be isolated from the building structure by anti-vibration mountings which shall be compressed machinery cork,spring or rubber dampers or rubber/metal bearers as indicated.

12.2 Noise

The noise produced by the installation in the spaces served,in any adjacent buildings and in the air surrounding plant rooms shall be kept as low as possible.This shall be specially considered in the selection of fan motors,grilles and the internal finish and arrangements of extraction ducting.

Noise level information for fans based on octave analysis data,shall be stated.The reference level and the testing technique shall be stated.

The sound level in the spaces served ,due to the equipment shall comply with the recommended design criteria given in the IHVE Guide (Table 13.1 of 1965 Edition).The maximum sound pressure level due to ventilation system must not exceed value mentioned below measured by a reference value of 2×10^5 N/meter squared transferred to a logarithm scale,and measured at any point 1.5 meters above the floor and 1.0meters from the walls.

The maximum sound pressure level measured at any point 4 meters from the extract point must not exceed 55Db

The maximum sound pressure level measured at any point 4 meters from fans must not exceed 60dB.

13 THERMAL INSULATION

13.1 General Description

All heated, cooled, and recirculated air ductwork shall be insulated.

Insulation shall be of 25mm thick expanded polystyrene sheet, or spray applied polyurethane foam to a uniform thickness of 25mm. Polystyrene shall be fixed so that the edges butt closely without gap and the insulation shall overlap at corners by the thickness of the insulation. The sheet shall be fixed by means of a suitable adhesive and plastic impingement pins attached to the ductwork.

13.2 Ductwork in Plant Room

The insulation described above in Clause 5.1 above shall be finished by the application of a 15mm thick layer of hard setting finish. Insulation shall bevelled thick to angle of 45 degrees at all connecting, access hatches and all other places where operation or maintenance is likely to cause the breaking of the insulation.

The insulation shall then be given a vapour sealing by the application of two coats of anti-condensation paint.

13.3 Ductwork External to Plant rooms

The insulation described in Clause 5.1 above shall finish by the application of two coats of bitumen paint..

14 ELECTRICAL EQUIPMENT AND WIRING

14.1 Scopes

The responsibility for electrical equipment and wiring shall be as defined as below:-

An on-off starter shall be provided and placed in the appropriate position for connection of the fans required the installation and within a time agreed with the Engineer fully detailed wiring diagrams for all connections to them shall be availed.

The installer shall be responsible for the accuracy of all wiring diagrams provided by him and for the correct internal wiring of all pre-wired equipment supplied. The installer shall reimburse the full cost of abortive or remedial work arising from any error in these aspects.

14.2 General

Unless otherwise indicated all electrical equipment and installation shall be suitable for use in ambient temperatures up to 40 degrees celsius and relative humidities up to 90%. For tropical climates, electrical equipment shall be suitable for use in the temperature and humidity as indicated; it shall be proof against atmospheric corrosion, including that of saline air where relevant, and materials shall not be susceptible to mould growth or attack by termite and similar hazards.

14.3 Electrical Motors

Electrical motors shall comply with BS 170 2048 or with BS 2613 and BS 3979 as appropriate. All motors shall have Class E insulation (BS2757) and can be continuously rated.

They shall be screen protected (BS2817) unless otherwise indicated. Under all normal conditions without being overloaded. All motors larger than 0.75kw output shall be three phase, for motors above 15kw output the type of motor and method of starting shall be such as to limit the starting and run-up currents to three times the rated full load current unless otherwise indicated. No motor shall run faster than 25 rev/s unless otherwise indicated.

15 INSPECTION, COMMISSION AND TESTING

15.1 General

Unless otherwise indicated tests shall be carried out in accordance with the appropriate BS or CP. Test certificates for works tests, site tests and tests required by BS shall be submitted in duplicate to the Engineer.

15.2 Testing

When an individual inspection or tests take place at outside the site of the works representatives of the Engineer will be required to present.

Unless otherwise indicated the contract shall include the cost of all tests, necessary instruments, plant supervision and labour both at work and on site. The accuracy of the instruments shall be demonstrated where so directed by the Engineer.

The site test shall be of at least six hours duration. Any defects of workmanship, materials and performance maladjustments or other irregularities which become apparent during the tests shall be rectified by the supplier at his expense and the tests shall be repeated at his expense to the satisfaction of the Engineer.

The supplier, installer's representative present at the sites tests shall be fully conversant with the operation of the thermostat controls and shall be expected to explain the operation and safety controls forming part of the installation to the employer's representatives.

15.2.1 Site Tests

The installer shall supply all instruments and equipment necessary to carry out tests and shall arrange with other parties for the testing of associated equipment which may affect the performance of the plants installed under these works.

15.2.2 Testing Fans

All fans shall be charged with suitable lubricant and shall be tested upon completion of the auxiliary system erection to ascertain that the performance of each fan complies with the requirements of the specification.

15.2.3 Completion of Works-Balancing and Commissioning

Following the site tests and prior to handover ,Mechanical Ventilation or Air-Conditioning systems shall be balanced by means of grills ,dampers and other special controls installs so to give the required air flow rates and where applicable the required temperatures ,pressures and humidity conditions in all areas served by the said systems.

The complete system shall be balanced and commissioned as a whole.Sectional balancing and commissioning on any part of the system where this excludes final complete system balancing and commissioning shall not be accepted.

Tests volumes within ducts shall be within +5% of the design volumes ,and volumes at grills and diffusers shall be within +10% of the design volumes.

When the system has been balanced to the satisfaction of Engineer ,it shall be run under complete automatic control for 72 hours continuous operation to ascertain any faults in operation before acceptance and handover .Any faults discovered during this time shall be corrected and another test or tests of 72 hours duration shall be carried out to ensure satisfactory operation ,all at the expense of the Contractor.

During this phase ,particular attention shall be paid to:

(i) The maintenance of cleanliness of all plant and extraction systems during construction and ensuring that extraction systems are cleaned through as part of commissioning.

(ii)The protection of plant ,particularly sensitive or fragile items ,from the activities of other trades during construction and from dirt and mal operation during commissioning.

(iii)The protection of electrical equipment from damp during construction and commissioning.

19.0 CONTROL SYSTEM

Particular attention shall be paid to the following features:

(i) Satisfactory operation of any automatic or manually operated sequence to be used in the event of fire.

(ii) Safety in the event of failure and of sudden resumption of electricity supply.

(iii) Satisfactory operation of safety interlocks designed for the protection of personnel, such as those associated with the high voltage electrically operated plant.

The following items shall be checked and/or tested and recorded on the site Test Certificate:-

- (i) Set devised value of all control devices
- (ii) Satisfactory operation of equipment protection devices
- (iii) Satisfactory operation of all sequencing operations and alternate working selections and automatic or manual change-over of duplicate plant.

16 NOISE AND SOUND CONTROL

Sound reading level shall be taken with a simple sound level meter using the 'A' scale weighting network. The spaces in which readings shall be taken shall be as agreed with the Engineer but will in general be the following:-

- (i) plant rooms
- (ii) Occupied rooms adjacent to plant rooms
- (iii) Outside plant rooms facing air intakes and exhausts to assess possible nuisance to adjacent accommodation. If the adjacent accommodation is private residential building tests may be required at night.
- (iv) In the space served by the first grille or diffuser after a fan outlet.
- (v) In any space where, by the addition of special licensing materials or techniques of by classification of use, a low level of noise is clearly required.

Alternatively, sound reading level shall be taken using a sound analyzer to give an octave band analysis of the ground spectrum and to pinpoint the frequency value of the peak sound levels. The spaces in which readings shall be taken shall be agreed with the Engineer but will in general be as detailed in paragraph above.

17 OPERATING AND MAINTENANCE INSTRUCTION

The contractor shall demonstrate and explain the plant and the method of starting, running and stopping to such staff as the Engineer shall nominate.

He shall provide three sets of operating and maintenance instructions which shall be enclosed in durable covers. The operating and maintenance instructions shall include:

- (i) A brief outline of the operation of the plant.
- (ii) Instructions on how to start and stop the plant, noting any safety and/or sequencing arrangements.
- (iii) Details of required maintenance with suggested frequency of action.
- (iv) Details of all lubricating oils and greases required and filter replacement.
- (v) Details of each item of plant including the name and address of the manufacturer, type and model, serial number, duty and rating.

The operating and maintenance instructions shall be handed to the engineer not later than at the end of the commissioning period.

18 SPARE PARTS

The installer shall submit a priced list of any extra materials which he recommends should be purchased for the ventilating and Air Conditioning Plants and all associated equipment and control gears and extras not supplied as standard. He shall be required to give a guarantee that he will hold sufficient running stock of spare parts for the maintenance of the equipment.

GENERAL SPECIFICATIONS FOR AIR CONDITIONING SYSTEMS

19 SCOPE OF WORKS

The works to be carried out comprises of supply, delivery, installation, setting to work, testing and commissioning of all materials and equipments called for in this specification and/or shown in the contract drawings.

The tenderer shall include for all appurtenances and appliances not particularly called for in this specification or on the contract drawings but which are necessary for the completion and satisfactory functioning of the system.

No claim for extra payment shall be accepted from the contractor for non-compliance with the above requirements.

If the opinion of the tenderer there exists difference between the specification and the contract drawings, the tenderer shall clarify the difference with the engineer before tendering.

The Works to be installed under the contract shall comply with the Ministry of Public Works requirements for contract works under “GENERAL MECHANICAL SPECIFICATION”**20 CLIMATIC CONDITIONS**

The following climatic conditions apply at the sites of the works and all materials and equipment used shall be suitable for these conditions:-

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It shall be deemed that the tenderer has based his tender on plant and equipment which is equal in performance to that stated within the specification.

22 SPLIT AIR CONDITIONING SYSTEM

The system shall be complete with

22.1 Indoor wall mounted cooling unit(Evaporator)

Each coil unit shall consist of a cooling coil,air circulating fan,fan-guard and a thermostatic expansion valve.A timer unit shall be mounted in the control panel both the de-frosting intervals and defrosting periods,both of which shall be variable.

The evaporator unit shall be of capacity as specified under the specific conditions,and shall be of the dry expansion type,and preferably of similar make as that of the condensing units.The unit shall be cassette type,high wall mounted or ceiling mounted as will be specified by the Engineer.

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The coil shall be manufactured from seamless copper tubing with aluminium fins mechanically bonded to the tubes.

The panel shall be interlocked such,that on energizing the heater,the compressor,condenser and evaporator fan shall be de-energized and only re-energized when the heater is switched off by a evaporator mounted thermostat.A manual overriding switch shall by-pass the timer switch.

The air-circulated fan shall be manufactured from rigid aluminium sheet and finished in white casing.A drip tray with 25mm diameter connections shall be incorporated in the base of the casing.

The unit shall be complete with the following:-

- a) 1 No.air purifying filter
- b) Built in drain pump to automatically drain water
- c) Refrigeration pipe work with flared conditions
- d) Fixing brackets/wall mounting kit/ground mounting kit
- e) Thermostat to control room temperature
- f) High and low pressure units
- g) Condensate discharge pipe work in Black PVC,15mm diameter
- h) Service access valves
- i) Voltage Surge Protector

The system shall be suitable for 240V, 1-Phase, 50Hz power supply

The split air-conditioning system shall be designed to maintain room inside temperature of 23+ or –C and relative humidity of 50+ or – 10%

22.2 Outdoor Units

The door unit shall be installed and mounted on the wall on the wall using appropriate mounting brackets. They shall be complete with hermetically sealed compressors. Safety devices shall include overload/surge protection among others.

The unit shall be connected to power provided by others. It shall be connected to refrigeration piping and control wiring. It shall have adequate charge of refrigerator oil and R 407 refrigerant.

The air conditioning units shall be as York or approved equivalent and shall be provided with approval mounting brackets.

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The Unit shall be complete with the following:

a) Casing constructed of 18 gauge zinc coated mild steel, zinc phosphate bonderized, coated with oven baked polyester paint and weatherized for outdoor installation. It shall have weep holes on base to allow ease of drainage.

b) Hermetically sealed compressor mounted to unit base with rubber isolated hold down bolts, uniform in oil and pressures and shall have internal overload protection.

c) Refrigeration pipe work with flared connections

d) Distributor with refrigeration control

e) Fixing brackets/wall mounting kit/ceiling mounting kit

f) Heat exchanger capacity controls

g) Precise inverter frequency controls

h) New oil returning system (refrigerant oil control system)

- i) High and low pressure units
- j) An innovation of installation with automatic address settings for indoor units with twin multiplex transmission system of no polarity
- k) Condensate discharge pipework
- l) Service access valves
- m) Voltage surge protector

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22.3 Refrigeration Piping

Refrigerant pipe work shall be approved copper tubing and fittings, and shall be properly sized in conformity with the system manufacturer specifications. Pipework shall be joined together by soldering/brazing and shall be complete with all necessary joints, reducers and accessories.

The Ozone friendly refrigerant flow shall be controlled with either a capillary tube or thermostatic expansion valve. Installation shall be carried out by competent and qualified craftsmen. The engineer may demand proof of qualifications and experience in installation of refrigeration systems.

Pipe work shall be tested for leaks after installation to the Engineers satisfaction. It shall be properly anchored, insulated and no vibration of pipes shall be allowed during the running of the systems. An electronic leak detector shall be used to test for leaks.

23 VARIABLE REFRIGERANT FLOW (VRF) SYSTEM

The VRF system shall be a dual aspect system (zone heating/cooling) with reduced energy and maintenance costs. The system shall be complete with flexible and user friendly central management system that will be integrated to building management system. The system shall be capable of more

personalized and accurate calculations of energy consumption. The required capacity and the relating technical parameters for the indoor units shall be electronically relayed to the system management and outdoor unit.

23.1 Inverter Controlled Outdoor Unit

The three-way pipe outdoor units shall be installed and mounted on the 3rd floor sky garden using appropriate and approved anti-vibration mounting/base. They shall be complete with hermetically sealed compressors. Safety devices shall include overall/surge protection among others.

The air conditioning unit shall allow for maximum 48 indoor units of different capacity and types to be connected to a single refrigerant circuit. It shall have an outdoor unit capacity ratio of 50-130% with nominal cooling load as stated in the bill of quantities and capacity control in the range of 10-130% according to the indoor cooling load.

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There shall be two outdoor units operating as duty and standby and connected to the same indoor units through control panel.

The unit shall be complete with the following:-

- a) Casing constructed of 18 gauge zinc coated mild steel, zinc phosphate bonderized, coated with oven baked polyester paint and weatherized for outdoor installation. It shall have weep holes on base to allow ease of drainage. It shall have permanently attached base rails with 3-way forklift access and lifting holes.
- b) Hermetically sealed compressors mounted to unit base with rubber isolated hold down bolts, uniform in oil and pressures and shall have internal overload protection.
- c) Advanced compressor oil management system.
- d) Compact flow selector unit
- e) TCC link: state-of-the-art connection bus system with automatically configured addressing and shall be Building management system (BMS) compatible.
- f) Heat exchanger capacity controls.

- g) Precise inverter frequency controls with intelligent power drive unit (IPDU)
- h) New oil returning system (refrigerant oil control system)
- i) High and low pressure units
- j) An innovation of installation with automatic address settings for indoor units with twin multiplex transmission system of no polarity.
- k) Condensate discharge pipe work
- l) Service access valves
- m) Voltage Surge Protector

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23.2 Indoor cooling unit (Evaporator)

Each coil unit shall consist of a cooling coil, air circulating fan, fan-guard and a thermostatic expansion valve. A timer unit shall be mounted in the control panel to both the de-frosting intervals and defrosting periods, both of which shall be variable.

The evaporator unit shall be of capacity as specified under the specified conditions, and shall be of the dry expansion type, and preferably of similar make as that of the condensing units. The unit shall be high static pressure ducted unit, cassette type, high wall mounted or ceiling mounted as it will be specified by the engineer.

The coil shall be manufactured from seamless copper tubing with aluminium fins mechanically bonded to the tubes.

The panel shall be interlocked such that on energizing the heater, the compressor, condenser and evaporator fan shall be de-energized and only re-energized when the heater is switched off by a evaporator mounted thermostat. A manual overriding switch shall by-pass the timer switch.

The air-circulating fan shall be manufactured from rigid aluminium sheet and finished in white casing. A drip tray with 25mm diameter connections shall be incorporated in the base of the casing.

The unit shall be complete with the following:-

- a) 1 No. air purifying filter
- b) Built-in drain pumps to automatically drain water
- c) Refrigeration pipe work with flared connections
- d) Fixing brackets/wall mounting kit/ground mounting kit
- e) Thermostat to control tempera

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- f) High and low pressure units
- g) Condensate discharge pipe work in Black PVC, 15mm diameter
- h) Service access valves
- i) Voltage Surge Protector
- j) Pulsed modulating valves (PMV) to permit linear variation of refrigerant flow in any circuit directly proportional to the thermal load.

The system shall be suitable for 240V, 1-Phase, 50Hz power supply.

23.3 Control Panel

Each system shall be provided for which a purpose made control panel fabricated from mild steel sheet of minimum SWG18 with a hinged door and then powder coated after manufacture. It shall be provided with an integral lock. It shall be complete with;

- a) Isolator

- b) Contractors
- c) Controlling thermostat with temp range from -10 to +30degrees celcius
- d)80mm dial thermometer with temp range from -10 to +30degrees celcius
- e)Motor starters & current overload relays
- f)MCBs
- g)Phase failure relay with over hand under voltage protection
- h)Timer switch for defrost control
- i)Push buttons for start and stop
- j)Audible and visual high temperature alarm with manual reset

The panel shall also have green light running indicators,red “door open”light and equipment circuit trip lights.

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23.4 System Controls Unit

The control unit shall be installed in the building management services(BMS)room with electric wiring to all indoor and outdoor units.The electric conduits/wiring to be done to chief Electrical & Mechanical Engineer,MOPW standards.

Controls unit for each system shall incorporate complete to ensure continuous system services.Such controls shall include protection against any possible motor overload and overheat,central control and monitoring for all the indoor units,individual temperature setting for each indoor unit,group control,set lock for each indoor unit and shall have self diagnosis function(display system errors)

The control unit shall control the duty and standby outdoor units to work alternatively for 12 hours.This will be achieved by opening and closing of solenoid valves which will close or open the refrigerant pipes to achieve this operation.

The unit shall have a lock release to allow for control of the system by using wireless or wired remote control at the place where the indoor unit is

installed. It shall also have a setup of a weekly and detailed schedule of the individual air conditioner.

The control unit shall have an open network controls designed for building management systems. It shall also have diagnostic software that will enable download of all operating parameters and instant analysis for commissioning and service.

The control system shall be complete with;

a) Weekly timer for a 7 day timer complete with day omit

b) Infrared wireless remote controller

c) Remote temperature sensor for all indoor units

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d) Network/protocol adaptor kit to enable integration with artificial intelligence network

e) External master on/off control board

f) Error output control board

g) Power peak cut control board

h) Touch screen controller for full control of up to 64 indoor unit including electric billing

i) Intelligent server and software package to allow connection to touch screen controller

j) Energy monitoring interface

23.5 Testing and Commissioning Standards

The system shall be balanced to the satisfaction of the Engineer. It shall be run under complete automatic controls for 72 hours continuous operation to ascertain any faults in operation before acceptance and handover.

Any faults discovered during this time shall be corrected and a further test or tests of 72 hours duration shall be carried out to ensure satisfactory operation, all the expenses of the contractor.

All accessories/equipment have to be tested for capacity, efficiency, leakages and other human errors shall meet standards and specifications.

23.6 As-Built-Drawings and maintenance manuals

Once the air conditioning system has been tested and commissioned, drawings and maintenance manuals shall be provided. They shall be a true and accurate representation of what has been commissioned.

23.6 Training

Adequate personnel shall be trained to perform normal operations and routine maintenance of the air conditioning system. The number of personnel to be trained shall be specified for particular pool.

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24 DUCTED AIR CONDITIONING SYSTEM

24.1 Packaged Air Handling Units

The air conditioning unit shall be ductable and self contained with nominal cooling load as described for the particular room, with reversible heating. The unit to be of vertical discharge.

The unit shall be encased in galvanized steel casing with polyester paint finish and shall be installed on a plinth provided by others, but the contractor shall mark in advance the exact dimensional position to the approval of the Engineer.

The whole system shall be complete with the following as will be required:

- a) Hermetic compressor with crankcase heater and anti-recycle timer
- b) Centrifugal fans with variable pulley-belt drive

- c)Expansion valve
- d)Washable filters
- e)Filter dryers
- f)Reversing valve
- g)High and Low pressure cut-out
- h)Unit circuit breaker
- i)Direct expansion blower unit
- j)Discharge plenum
- k)Air inlet protective grille

The contractor shall also be responsible for the ducting work of the rooms as described in particular specification for mechanical ventilation, drainage of condensed water from the drain pan and provision of anti-vibration mountings.

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25 TESTING AND COMMISSIONING

All the pipe work and connection herein described shall be tested in the pressure of the Engineer deems satisfactory and for a minimum period of 1 hour.

These tests must be therefore any insulation work is undertaken or any pipework is finally enclosed in any ducts, etc and due allowance is to be made in the tender for the tests.

The tenderer is to include for providing for all the testing equipment, temporary plugging and refilling, etc

26 ELECTRICAL WORKS

The installation of HVAC works shall include supply, installation and commissioning of all starters, control apparatus, control panels and interconnecting wiring and conduits for equipment.

Power points shall be provided within 5 meters of the equipment installation point and the equipment will be connected to this point.

27 BUILDERS WORKS

The HVAC installation shall allow for perforation of holes, hacking of walls etc. All disturbed surfaces shall thereafter be made good by the contractor upon satisfactory completion of the works.

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SECTION H:

BILLS OF QUANTITIES

AND

SCHEDULE OF UNIT RATES

BILLS OF QUANTITIES AND SCHEDULE OF UNIT RATES

CONTENTS

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2. STATEMENT OF COMPLIANCE.....	H-2
3. BILLS OF QUANTITIES	H-3 to PAGE-19
4. SUMMARY PAGE.....	PAGE-19

(i)

SPECIAL NOTES

1. The Bills of Quantities form part of the contract documents and are to be read in conjunction with the 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 16% VAT**).

In accordance with Government policy, the 16% 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, detailed manufacturer's Brochures detailing Technical Literature and specifications on the equipment they intend to offer (As indicated in the Technical schedule).

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1. 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, which can be perceived as an inducement to win this tender.

Signed:*for and on behalf of the Tenderer*

Date:

Official Rubber Stamp:

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BILLS No. 1

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 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 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 contract.

The Bills of Quantities are divided generally into three sections:-

Preliminaries – Bill 1

Sub-contractors preliminaries are as per those described in section C – sub-contractor preliminaries and conditions of contractor. The sub-contractor shall study the conditions and make provision to cover their cost in this Bill. The numbers of preliminary items to be priced by the Tenderer have 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 contract Drawings, conditions of contract and specifications.

The unit of measurements and observations are as per those described in clause 3.05 of the section C.

(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

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SCHEDULE 1:

Bills No. 1-PRELIMINARIES

ITEM	DESCRIPTION	QTY	UNIT	RATE	KSHS	CTS
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					
SUB-TOTAL CARRIED TO PAGE I-6						

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ITEM	DESCRIPTION	QTY	UNIT	RATE	KSHS	CTS
16	Supplies clause 1.20					
17	Bills of Quantities clause 1.23					
18	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 1.30					
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					
SUB-TOTAL CARRIED TO PAGE I-6						

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ITEM	DESCRIPTION	QTY	UNIT	RATE	KSHS	CTS
31	Attendance Upon Tradesmen, etc. (Insert percentage only) clause 1.58					
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)					
41	Any other preliminaries;					
	Subtotal above					
	Subtotal brought forward from page H-4					
	Subtotal brought forward from page H-5					
	TOTAL FOR BILL NO. 1- PRELIMINARIES CARRIED FORWARD TO PRICE MAIN SUMMARY PAGE/19					

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SECTION I:

TECHNICAL SCHEDULE OF ITEMS TO BE SUPPLIED

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(i)

TECHNICAL SCHEDULE

1. General Notes to the Tenderer

- 1.1 The tenderer shall submit technical schedules for all materials and equipment upon which he has based his tender sum.
- 1.2 The tenderer shall also submit separate comprehensive descriptive and performance details for all plant apparatus and fittings described in the technical schedules. Manufacturer's literature shall be accepted. Failure to comply with this may have his tender disqualified.
- 1.3 Completion of the technical schedule shall not relieve the Contractor from complying with the requirements of the specifications except as may be approved by the Engineer.

d) TECHNICAL SCHEDULE (MUST BE COMPLETED IN FULL)

ITEM No.	Description	Manufacturer	Country Of origin	Particulars
1	Water closet			

2	Wash hand basin			
3	Urinal system			
4	Water Tanks			
5	Booster Pumps			
6	Air conitioners			
7	Co2 fire extinguishers			
8	Co2/water fier extinguishers			
9	Hose reels			

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SECTION J:

SCHEDULE OF CONTRACT DRAWINGS

As will be issued by the Engineer during project implementation.

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SECTION K:

STANDARD FORMS

NOTE:

ALL FORMS IN THIS SECTION MUST BE FILLED AS THEY SHALL BE PART OF THE EVALUATION CRITERIA

STANDARD FORMS

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PERFORMANCE BANK GUARANTEE

To:

**The Vice Chancellor,
Pwani University College,
P.O. Box 195, KILIFI**

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

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

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

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of:

Kshs. (*amount of Guarantee in figures*)

Kenya Shillings

.....
.....(*amount of Guarantee in words*),

and we undertake to pay you, upon your first written demand and without 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 Contractor before presenting us with the demand.

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

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

SIGNATURE AND SEAL OF THE GUARANTOR

Name of Bank

Address.....Date.....

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/Fax 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

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 (2d) 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:
Kenya Shillings.....

Name of your bankers.....

Branch.....

Part 2 (a) - Sole Proprietor

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

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

Citizenship details

Part 2 (b) - Partnership

Give details of partners as follows:

	<i>Name in full</i>	<i>Nationality</i>	<i>Citizenship Details</i>	<i>Shares</i>
1.
2.
3.
4.

Part 2(c) - Registered Company

Private or Public
.....

State the nominal and issued capita of the company:

Nominal Kshs.

Issued Kshs.

Give details of all directors as follows:

	<i>Name in full</i>	<i>Nationality</i>	<i>Citizenship Details*</i>	<i>Shares</i>
1.	
2.	
3.	
4.	

Part 2(d) Interest in the Firm:

Is there any person/persons in the employment of the Government of Kenya WHO has interest in this firm? Yes/No (Delete as necessary)

I certify that the above information is correct.

.....
.....
Title
Date

.....
Signature

* Attach proof of citizenship

KEY PERSONNEL

Qualifications and experience of key personnel proposed for administration and execution of the Contract.

POSITION	NAME	YEARS OF EXPERIENCE (GENERAL)	YEARS OF EXPERIENCE IN PROPOSED POSITION
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

I certify that the above information is correct.

.....

.....

.....

Title

Signature

Date

CONTRACTS COMPLETED IN THE LAST FIVE (5) YEARS

Work performed on works of a similar nature and volume over the last five years.

<u>PROJECT NAME</u>	<u>NAME OF CLIENT</u>	<u>TYPE OF WORK AND YEAR OF COMPLETION</u>	<u>VALUE OF CONTRACT (Kshs.)</u>

I certify that the above works were successfully carried out and completed by ourselves.

.....
.....
Title
Date

.....
Signature

SCHEDULE OF ON-GOING PROJECTS

Details of on-going or committed projects, including expected completion date.

<u>PROJECT NAME</u>	<u>NAME OF CLIENT</u>	<u>CONTRACT SUM</u>	<u>% COMPLETE</u>	<u>COMPLETION DATE</u>

I certify that the above works are currently being carried out by us.

.....

.....

.....
Title
Date

Signature

**FINANCIAL REPORTS FOR THE LAST FIVE YEARS
(Balance sheets, Profits and Loss Statements, Auditor's reports, etc.**

List below and attach copies)

1. . _____
_____.

2. . _____
_____.

3. . _____
_____.

4. . _____
_____.

5. . _____
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**EVIDENCE OF FINANCIAL RESOURCES TO MEET
QUALIFICATION REQUIREMENTS**
**(Cash in Hand, Lines of credit, e.t.c. List below and attach
copies of supportive documents.)**

- 1.** • _____.
- 2.** • _____.
- 3.** • _____.
- 4.** • _____.
- 5.** • _____.
- 6.** • _____.
- 7.** • _____.
- 8.** • _____.
- 9.** • _____.
- 10** • _____.

**NAME, ADDRESS AND TELEPHONE, TELEX AND FACSIMILE
OF BANKS**

**(This should be for banks that may provide reference if
contacted by the employer)**

NAME	ADDRESS	TELEPHONE	TELEX	FACSIMILE

**DETAILS OF LITIGATIONS OR ARBITRATION
PROCEEDINGS IN WHICH THE TENDERER IS INVOLVED
AS ONE OF THE PARTIES**

1. . _____
_____.

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**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWANI UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<p><u>SPECIFICATIONS AND BILLS OF QUANTITIES FOR THE PROPOSED INTERNAL PLUMBING,SANITARY FITTINGS,DRAINAGE,AIR CONDITIONING,FIRE FIGHTING EQUIPMENTS INSTALLATIONS FOR THE PROPOSED CONSTRUCTION AND COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PHASE 1-PWANI UNIVERSITY COLLEGE:</u></p> <p><u>NOTE:The Tenderers for these works MUST BE registered with the NCA (from NCA-2 and above) and in the following category of Mechanical Works:-</u></p> <p>1). Plumbing,Sanitary fittings and Drainage 2)Water Tanks installations,Pumping and treatment plants</p> <p>3). Refrigeration,Air Conditioning and Mechanical Ventillation 4). Fire Engineering Services</p> <p><u>ELEMENT NO. 1 (INTERNAL PLUMBING):</u> <i>Supply, deliver and install pipes, tubing and fittings as described and shown on the drawings. The pipes shall be PN 25PPR pipes where exposed to adverse weather conditions and all conforming to the current European standards for PPR installations and to the Engineers Approval. Pipe jointing shall be by polyfusion or use electric coupling, Rates must allow for all metal/plastic threaded adaptors where required for the connection of sanitary fixtures, valves, sockets, sliding and fixed joints support raceways, isolating sheaths, elastic materials, expansion arms and bends cross overs, couplings, clippings, connectors, joints etc. as required in the running legths of pipe work and also where necessary, for pipe fixing clips, holder bats plugged and screwed for the proper and satisfactory functioning of the system. The pipes will be pressure tested before the plastering of wall commences and as per the manufactures recommended testing pressures</i></p> <p><u>PPR Pipes</u></p>				
A	20mm diameter pipework in wall chase	48	LM		
B	25mm Ditto	32	LM		
C	40mm Ditto	64	LM		
D	50mm ditto	16	LM		
E	65mm ditto	8	LM		
	Total Carried to Summary of Collection				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>Sockets:</u>				
A	20mm diameter socket	13	NO		
B	25mm ditto	9	NO		
C	40mm ditto	17	NO		
D	50mm ditto	6	NO		
E	65mm ditto	3	NO		
	<u>Bends</u>				
G	20mm diameter bends	8	No.		
H	25mm ditto	12	No.		
I	40mm ditto	12	No.		
J	50mm ditto	4	No.		
K	65mm ditto	4	No.		
	<u>Tees</u>				
L	32mm diameter equal tees	16	No.		
M	40mm ditto	16	No.		
N	50mm ditto	6	No.		
O	65mm ditto	4	No.		
	<u>Reducers</u>				
P	25x20mm Reducer	12	No.		
Q	32x20mm ditto	16	No.		
R	40x32mm ditto	4	No.		
S	50x40mm ditto	1	No.		
T	65x50mm ditto	1	No.		
	<u>Threaded Fittings</u>				
U	20mm diameter male/female threaded 90° bend/Elbow	42	No.		
V	40mm diameter PPR-M Adapter	8	No.		
W	50mm ditto	4	No.		
X	65mm ditto	4	No.		
	TOTAL CARRIED TO SUMMARY OF COLLECTION				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>ELEMENT NO.1 CONT'D:</u>				
	<u>Nipples</u>				
A	32mm diameter G.I. nipple	8	No		
B	40mm ditto	2	No.		
C	50mm ditto	2	No.		
D	65mm ditto	2	No.		
	<u>Valves</u>				
E	32mm diameter approved medium pressure screw down full way non-rising stem wedge gate valve to BS 5154 PN 20 for series B rating, with wheel and head joints to steel tubing and complete with round male threaded transition fittings. The gate valve to be as PEGLER or approved equivalent.	4	No.		
F	40mm ditto	4	No.		
G	50mm ditto	4	No.		
H	65mm ditto	4	No.		
	<u>Concealed flush valve</u>				
I	40 diameter wall mount push button 'Vandal Proof' concealed flush valve Cat.015505006-CR as MODEL 'COBRA' or equal and approved. The flush valve to be complete with 40mm diameter flush pipe and bend including connections to water closet (WC) pan and all other necessary accessories for the proper functioning .	56	No.		
J	Ditto but 'PRESSMATIC BENEFIT' type suitable for use by disabled persons Cat.00184906-CR ditto	14	No.		
	Carried to Summary of Collection				
	<u>Summary of Collection:</u>				
	Totals Brought Down From Above.....				
	Totals Brought Forward From Mech/2				
	Totals Brought Forward From Mech/1				
	TOTAL INTERNAL PLUMBING CARRIED TO COLLECTION				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<p><u>ELEMENT NO. 2:</u> <u>SANITARY FITTINGS:</u> Supply, deliver, install, test and commission the following sanitary appliances complete with all the accessories including all connections to the services, waste, jointing to water supply, overflows, supports and all plugging and screwing to walls and floors.</p> <p><u>Note.</u> (i). All sanitary fittings shall be in approved colour. (ii). The model and Ref. No. Indicated is only a guide to the type and quality of fittings. (iii). Equivalent and Approved models may be acceptable</p> <p><u>Close Couple Water Closet</u></p>				
A	<p>Close Couple water closet suite in approved colour comprising of W.C. bowl, 'p' or 's' trap connector, heavy duty matching plastic seat and cover with metal top fixed to (chrome plated) hinges and secured to floor or wall and complete with horizontal outlet to BS 3402 with 9 litre valveless Top Quality Ceramic Cistern and fittings including siphon, 15mm diameter side inlet ball valves, 20mm diameter side overflow, plastic flush bend, inlet connection, and chrome-plated lever.. The water closet suite to be as 'Model Twyfords' -England or other approved</p>	28	No		
B	<p><u>Counter Top Wash Hand Basin</u> Wash Hand Basin suitable for mounting on counter size 510x420mm with one tap holes and chain stay hole, 32 mm diameter chrome-plated pop up chain waste, first quality plastic bottle trap (32mm 'P' trap) with 75mm seal. The wash hand basin to be as 'Model Twyfords' Sola 510' or equal and approved. The basin to be supplied and installed complete with 15mm diameter heavy duty chrome plated -DELAY ACTION-WATER METERING' Pillar Tap as 'MODEL VADO' -ENGLAND or other equal and approved</p>	28	No		
C	<p><u>Squatting Water Closet</u> Squatting Water Closet Suite in white Vitreous China comprising of WC bowl with S-Trap, Connector and Integral foot threads, 9 Litre Ceramic Cistern and fittings, including siphon and pull chain, 15mm diameter side inlet ball valve, 20mm side overflow, first quality plastic 32mm flush pipe, Inlet connector and cistern supports, all to approval. The water closet suite to be as 'Model Twyfords' -England or other approved equivalent.</p>	56	No.		
	Total Carried to Summary of Collection				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>ELEMENT NO.2 CONT'D:</u>				
A	<u>Toilet Roll Holder</u> Semi recessed toilet roll holder in Vitreous China of size 165 x 165mm in approved colour as Twyford's 9806WH or equal and approved.	82	No.		
B	<u>Mirrors</u> 6mm thick polished plate glass silver backed mirror with bevelled edges, size 610 x 610mm, plugged and screwed to wall with 4No. Chrome plated dome screws	34	No		
C	<u>Bib Tap</u> 15mm diameter heavy duty 'Peglar' bib tap or other equal and to approved catalogue	82	No		
D	<u>Flexible Tubing</u> 15mm diameter x 300mm long flexible connectors complete with Integral chrome plated angle valve for connecting the Sanitary fitting to water supply. To be as Cobra or equal and approved.	96	No.		
	<u>Three Range Urinal Set</u> <u>The following 3-Range Clifton Urinal C/W ceramic cistern, sparge and flush pipes clips and connector pipes.</u>				
E	Automatic Urinal system comprising of 3No. Ceramic Urinal Bowl divisions stainless steel flush and connector pipes, 7.5 Litre Automatic Ceramic Cistern, sparge, spreader, doomed waste and 40mm diameter stainless steel outlet with grating including fixing to wall with steel screws brackets and. The Urinal set shall be as Model 'Twyford's -England or other equal and approved	6	SET		
F	<u>Soap Dispenser</u> Wall mounted soap dispenser with a capacity of about 1.5 Litre and having a press action soap release mechanism complete with fixing screws. including allowing for initial soap supply as 'Starmix or other approved equivalent. The soap dispenser shall be size 125x100x290mm high and shall be as 'Model Mediclinics' or other approved equivalent	16	No		
	TOTAL CARRIED TO SUMMARY OF COLLECTION				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>ELEMENT NO.2 CONT'D:</u>				
A	<p><u>Disabled persons Water Closet and Wash Hand Basin Facility</u> Wheel chair accessible W.C facility Comprising of the following:- (i)Close coupled W.C with 7.5 litre cistern with bottom inlet and overflow. The bowl shall e of size 375 x 560 x 420mm high. The bowl and cistern shall be manufactured from vitreous china complying with B.S 3402. The unit shall be complete with valveless cistern fitting including syphon, 15mm side inlet ball valve, 20mm diameter side overflow, plastic flush bend, inlet connector and reversible metallic chrome plated cistern lever. There shall also be a heavy duty seat (25mm high) and cover with chrome plated metal hinges, toilet roll holder, 900 x 450 x 6mm thick mirror and Robe hook (ii) Semi-recessed wall mounted W.H.B of size 600 x 500 x 545mm high with flexible connectors to water taps. The basin shall be manufactured from vitreous china complying with B.S 3402. It shall have one L/H tap hole with 15mm chrome plated lever action pillar tap, chrome plated waste, first quality bottle trap, pedestal and wall fixing bolts. (iii) Hinged support rail with toilet roll holder 770mm long manufactured in nylon coated aluminium and mounted on a wall fixing plate size 230x100mm, 4 No. 600mm grab rails with covered wall plates. The Disabled set shall be as Twyfords-England-DOC.M wheel chair accessible W.C facility or approved</p>	12	SET		
B	<p><u>Laboratory Sinks and Taps</u> 500x400x225mm deep 'Vulcathene black' injection moulded polypropythere sink with self draining base and an outlet to accept the waste as cat. No.602 complete with 15mm diameter 'vultex' labline bench mounted 1-way outlet fitting with inlet for supply and side control valve having high neck laboratory swivel nozzle and spout, Vulcathene' plug, backnut, rubber gasket and 'Vulcathene anti-siphon bottle trap</p>	6	No		
C	<p><u>Robe Hook</u> Robe hook in vitreous china mounted to concealed screw to wall wedges as Twyfords 'ECLIPSE' accessories or equal and approved</p>	6	No.		
	TOTAL CARRIED TO SUMMARY OF COLLECTION				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWANUNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
A	<p><u>ELEMENT NO.2 CONT'D:</u> <u>Pedestal Wash Hand Basin</u></p> <p>Wash Hand Basin with pedestal size 510x420mm with one tap hole and chain stay hole,32 mm diameter chrome-plated pop up chain waste and fittings,approved first quality plastic bottle trap(32mm bottle trap) with 75mm seal.The wash hand basin to be as 'Model Twyfords 'Sola 510'or equal and approved.The basin to be supplied and installed complete with 15mm diameter heavy duty chrome plated-Bricon Basin Tap other equal and approved</p>	14	No		
B	<p><u>Hand Drier</u></p> <p>Automatic Hand Drier in approved colour operating on infra-red automatic sensing system with heating element,safety cut-out complete with a 30-seconds safety timer,plastic rawl plugs and fixing screws.The hand drier to have a heating capacity of 3.1Kw and performance flow rate of 3.82 Litres/Min and to be of size 270x264x143mm deep.It shall have a noise level of below 72.5dBA at 1.5m.It shall be as 'Model Mediclinics' or other approved equivalent</p>	4	No		
C	<p><u>Soap Dispenser</u></p> <p>Wall mounted soap dispenser with a capacity of about 1.5 Litre and having a press action soap release mechanism complete with fixing screws.including allowing for initial soap supply as 'Starmix or other approved equivalent.The soap dispenser shall be size 125x100x290mm high and shall be as 'Model Mediclinics' or other approved equivalent</p>	4	No		
D	<p><u>Towel Rail</u></p> <p>Chrome plated 20mm diameter x 800mm long approved towel rail and brackets as one piece, plugged and screwed into the wall. The fitting ball shall be as Twyfords or equal and approved.</p>	12	No		
	Total Carried to Summary of Collection				
	<p><u>SUMMARY OF COLLECTION</u> Totals Brought Forward From Above).....</p> <p>Totals Brought Forward From Mech/6</p> <p>Totals Brought Forward From Mech/5</p> <p>Totals Brought Forward From Mech/4</p>				
	TOTAL SANITARY FITTINGS CARRIED TO COLLECTION				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<p><u>ELEMENT NO.3:</u> <u>FOUL DRAINAGE:</u> Supply, deliver and install the following UpVC, MUpVC, soil and waste systems, respectively to B.S5255 with fittings fixed Key Terrain High Grade Golden Brown and Grey UPVC soil and waste pipe and jointing in accordance with manufacture's printed instructions and manufactured by reputable manufacturers. Tenderers must allow in their pipework prices for all the couplings, clippings connectors, joints, e.t.c as required in the running lengths of pipework and also where necessary, for pipe fixing clips, holder bats plugged and screwed for the proper and satisfactory functioning of the system</p>				
	<u>Internal:</u>				
A	40mm diameter Grey UPVC waste pipe in wall chase.	72	LM		
B	40mm ditto but boxed in concrete floor slab	72	LM		
C	50mm ditto	32	LM		
D	100mm ditto but in wall duct	96	LM		
	<u>Extra Ovetubing For:-</u>				
E	100x50mm diameter UPVC floor trap, grating and cover	2	No		
F	100x50x40mm diameter Master gulley floor trap ditto	24	No		
G	100mm diameter WC connector	122	No		
	<u>External::</u>				
H	50mm diameter Grey UPVC soil vent pipe with expansion coupling and fixing to wall with holder bats ducts	18	LM		
I	75mm ditto	18	LM		
J	100mm ditto	36	LM		
K	100mm diameter Golden Brown UPVC waste pipe in soil	72	LM		
L	160mm ditto	24	LM		
	Total Carried to Summary of Collection				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
A	Element No.3 Cont <u>Extra Overtubing For:-</u> 40mm diameter access tee and cap	8	No		
B	50mm ditto	4	No		
C	100mm diameter Inspection bend and Acces cap.	16	No		
D	50mm diameter vent cowl	2	No		
E	75mm ditto	2	LM		
F	100mm ditto	4	No		
G	50mm diameter weathering Slate and Apron	2	No		
H	75mm ditto	2	LM		
I	100mm ditto	3	No		
J	100mm diameter medium duty UPVC gulley trap, grating cover and waste	8	NO		
	Total Carried to Summary of Collection				
	<u>SUMMARY OF COLLECTION</u> Totals Brought Forward From Above..... Totals Brought Forward From Mech/8				
	TOTAL FOUL DRAINAGE CARRIED TO COLLECTION				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<p><u>ELEMENT NO. 4:</u></p> <p><u>STERILIZATION AND TESTING:</u></p> <p>A Allow for sterilization and flushing out of entire cold water installation with chlorine to the Engineer's Satisfaction</p> <p>B Ditto for setting to work and testing the whole of the plumbing and drainage installation works both during progress and at completion to the satisfaction of the Engineer's satisfaction and to leave the whole installation in good working condition</p>	1	ITEM		
	TOTAL TESTING CARRIED TO COLLECTION				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>ELEMENT NO.5:</u>				
	<u>BUILDER'S WORK IN CONNECTION WITH PLUMBING AND DRAINAGE</u>				
A	<u>Masonry Gulley Trap</u> Construct masonry gulley trap size 200x200mm, approx depth 300mm, complete with seal and concrete cover, including all disposal and form work	8	No.		
B	<u>Manholes and Covers</u> Construct Manholes size 600 x 450mm and averaging 750mm deep constructed in 100mm thick concrete base(1:3:6), approved 150mm block sides rendered all around in cement and sand (1:4). It shall have an approved heavy duty cast iron cover and frame as manufactured by E.A Foundry works, including all necessary excavations, disposal and form work.	16	No.		
C	<u>Excavations</u> Excavate trench not exceeding 1.5m deep, average depth 600mm for laying of drain pipes as earlier described, part back fill, part load and cart away remainder	96	LM		
D	<u>Chasing</u> Form chase in both 100mm and 200mm thick coral block wall to receive necessary pipe work and make good disturbed areas	232	LM		
E	<u>Holes</u> Make a hole through 100mm thick coral block wall for small pipe and make good disturbed areas	100	No.		
F	Ditto but 200mm thick and for large	122	No.		
G	<u>Pipe Sleeves</u> Allow for fixing of pipe sleeves during concreting for cross over of pipes in columns, beams and slab	6	ITEM		
	TOTAL BUILDERS WORK CARRIED TO COLLECTION				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<p><u>ELEMENT NO.6:</u> <u>AIR CONDITIONING:</u> <u>Supply,deliver and install the following Split System Air Conditioners comprising of the Indoor and Outdoor Units as herebelow described and to positions indicated on the contract drawings and as instructed by the Engineer:-</u></p>				
A	<p><u>Indoor Wall mounted Cooling Unit(Evaporator)</u> Fully packaged wall mounted Indoor Unit (Evaporator) cooling load capacity (12000 BTU/HR) as 'MODEL WEST POINT' or other approved equivalent.The unit shall be complete with 1No.Air purifying filter,built in water drain pump, flared connections for refrigeration pipe work,fixing brackets and wall mounting kit,Capillary tubing connection,Thermostat,including high and low pressure cut-outs,concealed condensate discharge pipe work in Black PVC,15mm diameter and chased in to wall,service access valves and voltage surge protector as 'MODEL SOLLATEK AVS or other equal and approved,including all other necessary items for the proper functioning of the entire Indoor(Evaporator) cooling unit system</p>	2	ITEM		
B	Ditto 24000 BTU/HR ditto	2	ITEM		
C	<p><u>Outdoor Wall Mounted Condensing Unit:</u> Fully Packaged set of wall mounted Refrigeration Condensing Unit typical for connection and supply to the above described Indoor Unit,Capacity, (12000BTU/HR) and as 'MODEL WEST POINT' or other equal and approved.The unit shall be complete with a casing constructed in 18gauge zinc coated mild steel,zinc phosphate bonderized,coated with oven baked polyster paint and weatherized for outdoor installation.It shall also have weep holes on base to allow ease of drainage,Hermetically sealed compressor mounted on unit base with rubber isolated hold down bolts,Air cooled Condensers and Internal overload protection.The Unit shall also be complete with Distributor for Refrigeration Control,Fixing bracket,Wall/Ceiling mounting Kit,Heat exchanger capacity and Precise Inverter frequency controls,Refrigerant oil control system,including condensate discharge pipe work,service access valves,sight glass,Filter Drier,Condenser Fan and all other necessary Items for the proper functioning of the entire condensing unit system.</p>	2	ITEM		
D	Ditto 24000 BTU/HR ditto	2	ITEM		
	Total Carried to Summary of Collection				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	Element No.3 Cont				
A	<u>Refrigeration Pipework</u> A set of Refrigeration Pipework complete with flared connections and fittings in approved copper tubing approx.10metres long,including flexible condensate dripline approx.6.0metres long,properly fixed and encased in 20mm diameter black PVC Conduit in conformity with 'APPROVED REFRIGERATION MANUAL'.The suction line shall be insulated with at least 25mm thick of Armaflex or other equal and approved material	10	LM		
B	<u>Testing</u> Allow for testing of the above Air Conditioning Units both during progress of installation and at completion to the Engineers satisfaction,including initial charging of the system with Refrigerant gas R.410A or other equal and approved and to leave the system in good and sound working condition	4	ITEM		
	Total Carried to Summary of Collection				
	<u>SUMMARY OF COLLECTION</u> Totals Brought Forward From Above)..... Totals Brought Forward From Mech/12				
	TOTAL FOR AIR CONDITIONING CARRIED TO COLLECTION				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>ELEMENT NO.7:</u> <u>WATER RETICULATION(ALL PROVISIONAL):</u> <u>Roof Top Water Tanks</u>				
A	Supply, deliver and install vertical close end plastic moulded tank of capacity 10,000 litres and (size 2400mm diameterx 2800mm high). The tank to be assembled complete with cover and having screwed connections fo inlet, outlet, overflow, 32mm high pressure ball valve, drain pipes and any other item necessary for its proper functioning.. The tank shall be installed on a flat roof base appro. 10 Metres high and shall be as "Roto Model' or equal and approved	6	ITEM		
	<u>Excavations</u>				
B	Excavate trench in soil/murram for Water Mains supply pipe not exceeding 1200mm deep ,lay pipe,part return in,fill ram and surplus cart away	208	LM		
	<u>Pipe Work</u>				
C	40mm diameter (PN-20) PPR Riser in wall chase	24	LM		
D	40mm ditto but distribution pipework to roof terrace water tanks	60	LM		
E	50mm ditto	36	LM		
F	65mm ditto	16	LM		
G	50mm diameter (PN-20) PPR Pipelaid and jointed in trench	48	LM		
H	65mm ditto	60	LM		
I	75mm ditto	100	LM		
	<u>Extra Overtubing for:</u>				
	<u>Sockets:</u>				
J	40mm diameter PPR Sockets	22	No.		
K	50mm ditto	23	No.		
L	65mm ditto	16	No.		
M	75mm ditto	26	No.		
	Total Carried to Summary of Collection				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>ELEMENT NO.7 CONT'D:</u>				
	<u>Bends</u>				
A	50mm diameter bend/Elbow	2	No.		
B	65mm ditto	2	No		
	<u>Tees</u>				
C	40mm diameter (PN-20) PPR equal tee	2	No.		
D	50mm ditto	2	No.		
E	65mm ditto	2	No.		
	<u>Valves</u>				
F	65mm diameter supply mains full way gate valve as PEGLAR or equal and approved	1	No.		
	<u>Water connection and Testing</u>				
G	100mm diameter mechanical joint	2	No.		
H	100x100x100mm (G.I) equal tee	1	No.		
I	100mm diameter (G.I) socket	1	No.		
J	100mm diameter (G.I) Nipple	1	No.		
K	100mm x 75mm diameter (G.I) Reducer	1	No.		
L	100mm diameter PPR-M Adapter	1	No.		
M	100x75mm Ddiameter PPR Reducer	1	No.		
	<u>Stand Pipe</u>				
N	15mm diameter bib tap suitable for connecting to a hose pipe complete with threaded adaptors. The tap to be complete with 5-metre long 20mm diameter pipe, bends, e.t.c. The chrome plated bib tap to be as 'cobra' Ref.107EC taps or other approved equivalent	4	ITEM		
	<u>Mains Valve Chamber</u>				
O	Construct Mains Valve Chamber size 600x600x500mm deep with 100mm thick concrete block rendered all round in cement and sand mortar (1:4) including hinged iron cover and frame in grease	1	ITEM		
	TOTAL CARRIED TO COLLECTION				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
A	<p><u>ELEMENT NO.7 CONT'D:</u> <u>Booster Pump Sets</u> Booster Pump Sets for Roof Top water Tanks mounted on a common Mild Steel base Frame and to approval, each set comprising of, One pump duty, One pump stand by, and each of capacity 12m³/hr against a Maximum Head of 50(metres) as MODEL GRUNDFOSS (CH12-50) or equal and approved. Each pump set shall be complete with control panel, MCBS, Pressure and Float switches, Overload protection, ON/OFF Buttons, Indicator Lights, Non-Return and Gate valves and a Pressure Vessel of Approx Capacity 24Litres as VAREM or equal and approved including all other accessories for proper functioning. The pumps shall be connected in that when the Running Duty pump fails the Standby Pump starts up automatically.</p>	2	SET		
B	<p><u>Testing</u> Allow for connecting the above earlier described Booster pumps to the pump delivery and suction lines, including Test Pumping and testing the whole of the water Reticulation system both during progress and at commissioning to the Engineer's satisfaction and to leave the system in good and sound working condition</p>	2	ITEM		
	Total Carried to Summary of Collection				
	<p><u>SUMMARY OF COLLECTION</u> Total Brought Down From Above..... Total Brought Forward From Mech/15 Total Brought Forward From Mech/14</p>				
	TOTAL WATER RETICULATION CARRIED TO COLLECTION				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>ELEMENT NO.8 (FIRE FIGHTING AND PROTECTION SERVICES);</u> <u>Supply, deliver and install the following fire fighting equipment in positions indicated on the contract drawings or as shall be instructed by the Engineer. Tenderers during pricing should allow for all fittings, jointings, couplings, including unions and clamps, where necessary for the proper functioning of the</u>				
A	<u>Hose Reels.</u> 20mm diameter x 30Metre long swinging type hose reel complete with delivery hose, nozzle, mild steel feed pipe, isolation valve, guide, bracket and all other accessories as ANGUS FIRE ARMOUR or other equal and approved.	18	No.		
B	<u>Hose Reel Fire Tank</u> Supply, deliever and install vertical close end plastic moulded tank of capacity 10,000 Litre (Size 2400 diameter x 2800mm high). The tank to be assembled complete with cover and having screwed connections for inlet, outlet and overflow, 32mm medium pressure ball valve, drain pipes and any other necessary item for its proper functioning. The tank shall be mounted on a flat roof slab and shall be as 'Model 'ROTO' or other equal and approved.	2	ITEM		
C	<u>Pipework (G.I)</u> 20mm diameter medium grade galvanized mild steel supply pipe	36	LM		
D	25mm ditto	36	LM		
E	32mm Ditto	120	LM		
D	40mm ditto	24	LM		
E	50mm Ditto	24	LM		
	<u>Sockets</u>				
F	25mm diameter (G.I)socket	7	No.		
G	25mm ditto	7	No.		
H	32mm Ditto	20	No.		
I	40mm ditto	24	No.		
J	50mm Ditto	24	No.		
	Total Carried to Summary of Collection				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>ELEMENT NO.8 CONT'D:</u>				
	<u>Unions</u>				
A	32mm diameter (G.I)union	10	No.		
	<u>Bends/Elbows</u>				
B	20mm diameter (G.I) bend	30	No.		
C	32mm Ditto	10	No.		
D	40mm Ditto	2	No.		
	<u>Tees</u>				
E	25mm diameter (G.I)equal tee	10	No.		
F	32mm ditto	1	No.		
G	40mm Ditto	10	No.		
H	50mm Ditto	2	No.		
	<u>Reducers</u>				
I	25x20mm diameter G.I. Reducer	2	No.		
J	32x25mm ditto	1	No		
K	40x32mm ditto	1	No		
L	50x32mm ditto	1	No		
M	50x40mm ditto	1	No		
	<u>Nipples</u>				
N	20mm (G.I) nipple	30	No.		
	<u>Painting</u>				
O	Prepare prime and apply two coats of gloss oil paint-RED- on the general surfaces of the above described Hose Reel supply pipes	1	ITEM		
	Total Carried to Summary of Collection				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>ELEMENT NO.8 CONT'D:</u>				
	<u>Hose Reel Booster Pump Sets</u>				
A	Booster Pump Sets for Hose Reels mounted on a suitable Mild Steel base Frame and to approval each set comprising of, One pump duty, and each of capacity 8m ³ /hr against a Maximum Head of 32(metres) as MODEL GRUNDFOSS (CH8-32) or equal and approved. Each pump set shall be complete with control panel, MCBS, Pressure and Float switches, Overload protection, ON/OFF Buttons, Indicator Lights, Non-Return and Gate valves and a Pressure Vessel of Approx Capacity 24Litres as VAREM or equal and approved including all other accessories for proper	2	SET		
	<u>Booster pump set for Fire Hydrants</u>				
B	DAYLIFE FLA fully packaged booster pump set for fire Hydrants MODEL DAYLIFE (FLA 100) Parallel Duty 100m ³ /hr single duty 50m ³ /hr, Diesel and Electric pump Sizes E50 - 26 and E50 - 20 ,respectively including DB 4 - 60 horizontal multi stage JOCKEY centrifugal pump fitted with one 1.0KW Electric Motor. The pump shall also comprise of an intergrally mounted control panel and other pump accessories incorporating incoming mains isolator and MCB, Voltage Control relay, MCB and star-Delta starter for the main Pump, MCB and DOL starter for the jockey pump, pump run/trip/no water indicators, 12 Volt DC power circuit for the engine, gate and non return valves, DC battery charging system and 300 Litre Vertical Pressure Vessel as VAREM or equal and approved, including all other necessary items for the proper functioning of the entire pump inn system	1	SET		
	<u>Pump Suction & Discharge Lines(All Provisional)</u>				
	<u>Pump Suction Lines</u>				
C	50mm diameter medium grade (G.I) Suction lines	24	LM		
D	100mm diameter ditto	12	LM		
	<u>Pump Delivery Lines</u>				
E	50mm diameter medium grade (G.I) Discharge lines	60	LM		
	TOTAL CARRIED TO SUMMARY OF COLLECTION				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>ELEMENT NO.8 CONT'D:</u>				
	<u>Extra over (G.I) tubing for Pump manifolds and above described pipework:-</u>				
A	50mm diameter (G.I) elbow/bend	2	No.		
B	65mm ditto	2	No.		
C	100mm ditto	4	No.		
D	50mm diameter equal tee	26	No.		
E	65mm ditto	3	No.		
F	100mm diameter bend	1	No.		
G	100mm diameter (G.I) socket	1	No.		
H	100mm diameter (G.I) nipple	1	No.		
	<u>Fire Hydrants</u>				
I	100x65mm diameter screw down (Type 2 B.S.750) underground Fire Hydrant Set complete with 65mm diameter landing valve, Branched Stand pipe, Key and Bar, all to the manufacturers specifications and to approved catalogue. The hydrant shall also comprise of 100mm diameter G.I. Nipple, 100x6mm thick mild steel	6	ITEM		
	<u>Fire Hydrants Water Supply</u>				
J	100mm diameter G.I. Medium grade supply pipe to the above Hydrants	96	LM		
	<u>Extra over (G.I) tubing for:-</u>				
K	100mm diameter equal tee	4	No.		
L	100mm diameter bend	4	No.		
M	100mm diameter (G.I) socket	25	No.		
N	100mm diameter (G.I) nipple	5	No.		
	TOTAL CARRIED TO SUMMARY OF COLLECTION				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>ELEMENT NO.8 CONT'D:</u>				
A	<u>Painting</u> Allow for priming with suitable anti rust oil paint and to approval on the general surfaces of the above described (G.I) pipework before laying in trenches	1	ITEM		
B	<u>Surface Boxes</u> Construct Hydrant Chamber approx. size 1200x1200x750mm deep with 100mm concrete block wall rendered all round in cement and sand (1;4) including supply and fixing of 600x450mm mild steel iron cover and frame in grease	6	ITEM		
C	<u>Marker Post</u> Standard Pre cast concrete (1:2:4) fire hydrant marker post marked (FH) set in concrete (1:3:6) base including excavations and disposal and all necessary painting.	6	ITEM		
D	<u>Testing</u> Allow for connecting the above earlier described Booster pumps to the pump delivery and suction lines, including Test Pumping and testing the whole of the water Reticulation system both during progress and at commissioning to the Engineer's satisfaction and to leave the system in good and sound working condition	2	ITEM		
	<u>Supply, deliver and install the following Portable Fire extinguishers to positions indicated on the contract drawings and as instructed by the Engineer:-</u>				
E	<u>Dry Powder Fire Extinguisher</u> 9Kg cartridge type general purpose portable dry powder fire extinguisher fully charged or equal and approved.	18	No.		
F	<u>Carbon dioxide Gas Fire Extinguisher</u> 5kg carbon dioxide gas portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets	18	No.		
G	<u>Water Carbon Dioxide Fire Extinguisher</u> 9.0 Litre Water carbon dioxide (WCo2) portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	18	No.		
	TOTAL CARRIED TO SUMMARY OF COLLECTION				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>ELEMENT NO.8 CONT'D:</u>				
A	<u>Signage</u> Allow for the Signage of fire hose Reel, fire exits and fire instructions all as described in the particular specifications and to the Project Engineer's Approval.	18	ITEM		
B	<u>Testing</u> Testing the whole fire fighting equipments to leave in sound working condition and to the Engineer's satisfaction	54	ITEM		
	Total Carried to Summary of Collection				
	<u>Summary of Collection:</u> Total Brought Down From Above..... Total Brought Forward From Mech/21 Total Brought Forward From Mech/20 Total Brought Forward From Mech/19 Total Brought Forward From Mech/18 Total Brought Forward From Mech/17				
	TOTAL FIRE FIGHTING CARRIED TO COLLECTION PAGE				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<p><u>PROVISIONAL SUMS:</u> <u>The following Provisional Sum to be Spend upon issuance of Instructions before and/or during progress of work for Engineer's Project Management Expenses.</u></p>				
A	<p>Provide a Provisional Sum of Kenya Shillings Three Hundred Thousand (Kshs. 300,000.00) only for Engineers Supervision and Contract Administration Expenses</p> <p><u>The following Provisional Sum to be Spend upon measurements on completion and priced in accordance with the rates contained in these Bills of Quantities or prorata thereto or deducted in whole if not required.</u></p>	1	ITEM		300,000
B	<p>Provide a Provisional Sum of Kenya Shillings One Million, (Kshs.1,000,000.00) only for Contingencies</p>	1	ITEM	1E+06	1,000,000
	TOTAL PROVISIONAL SUMS CARRIED TO COLLECTION PAGE				

**PROPOSED MECHANICAL WORKS (SUB-CONTRACT) FOR THE CONSTRUCTION
COMPLETION OF SCHOOL OF HUMANITIES COMPLEX-PWAN UNIVERSITY COLLEGE:**

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<p><u>GRAND SUMMARY OF COLLECTION PAGE:</u></p> <p>PRELIMINARIES BROUGHT FORWARD FROM PAGE H-6</p> <p>TOTALS FOR INTERNAL PLUMBING</p> <p>TOTALS FOR SANITARY FITTINGS</p> <p>TOTALS FOR DRAINAGE</p> <p>TOTALS FOR TESTING</p> <p>TOTALS FOR BUILDERS WORK</p> <p>TOTALS FOR AIR CONDITIONING</p> <p>TOTALS FOR WATER RETICULATION</p> <p>TOTALS FOR FIRE FIGHTING SERVICES</p> <p>TOTAL FOR PROVISIONAL SUMS</p>				
	GRAND TOTAL.....				

AMOUNT OF TENDER SUM IN WORDS

.....

NAME AND ADDRESS OF CONTRACTOR

.....

DATE:.....SIGNATURE.....

NAME AND ADDRESS OF WITNESS

.....

DATE:.....SIGNATURE.....