JARAMOGI OGINGA ODINGA UNIVERSITY

OF SCIENCE AND TECHNOLOGY

TENDER DOCUMENT

FOR

TENDER NUMBER JOOUST/ONT/A4/30/2019-2020: TENDER FOR AIRCONDITIONING AND MECHANICAL VENTILATION INSTALLATION WORKS FOR ADMINISTRATION BLOCK AT THE MAIN CAMPUS - BONDO, SIAYA COUNTY

CLOSING DATE 22nd JULY 2020

OPENING DATE 4TH AUGUST 2020

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INTRODUCTION

1.1 This standard tender document for procurement of works has been prepared for use by procuring entities in Kenya in the procurement of works (i.e Electrical and Mechanical Works – Including Erection on Site)

1.2 The following guidelines should be observed when using the document:-

(a) Specific details should be furnished in the tender notice and in the special conditions of contract (where applicable). The tender document issued to tenderers should not have blank spaces or options.

(b) The instructions to tenderers and the General Conditions of Contract should remain unchanged. Any necessary amendments to these parts should be made through Appendix to instructions to tenderers and special conditions of contract respectively.

1.3 (a) Information contained in the invitation to tender shall conform to the data and information in the tender documents to enable prospective tenderers to decide whether or not to participate in the tender and shall indicate any important tender requirements

(b) The invitation to tender shall be as an advertisement in accordance with the regulations or a letter of invitation addressed to tenderers who have been prequalified following a request for prequalification.

1.4 This document is based on PART 1 of the third Edition of the International Federation of Consulting Engineers (Federation Internationale des Ingenieurs Con Seils – FIDIC) Conditions of Contract for Electrical and Mechanical Works, 1987 (reprinted May 1988 with Editorial Amendments).

1.5 The cover of the tender document should be modified to include:-

i. Tender number.
ii. Tender name.
iii. Name of procuring entity.
iv. Delete name and address of PPOA

SECTION 1

SECTION I INVITATION TO TENDER

TENDER REF NO: JOOUST/ONT/A4/30/2019-2020

TENDER NAME: TENDER FOR AIR CONDITIONING AND MECHANICAL VENTILATION INSTALATION WORKS FOR THE ADMINISTRATION BLOCK AT MAIN CAMPUS - BONDO, SIAYA COUNTY

1.1 Jaramogi Oginga Odinga University of Science and Technology invites sealed bids from eligible candidates for Tender for Air Conditioning and Mechanical Ventilation Installation for Administration Block at Main Campus - Bondo, Siaya County**.**

1.2 Tender documents with detailed specifications shall be downloaded free of charge at the University website **www.jooust.ac.ke** and Public Procurement Information Portal **www.tenders.go.ke.**Tenderers who download the tender document and intend to submit a bid are required to submit their particulars to the University through email: **proc@jooust.ac.ke** for the purpose of receiving any further clarification and\or addendum.

1.3 **THERE SHALL BE MANDATORY SITE VISIT TO BE HELD ON 8TH JULY 2020 FROM 10 AM AT THE ADMINISTRATION BLOCK SITE IN THE MAIN CAMPUS**

1.4 Dully filled tender documents are to be enclosed in plain sealed envelopes, marked with the tender number, tender description **and bearing no indication of the applicant**, clearly /marking each "**ORIGINAL TENDER**" and "**COPY OF TENDER**" should be deposited in the tender box at Jaramogi Oginga Odinga University of Science and Technology or be addressed to:-

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

1.5 The tender document should reach on or before **22nd JULY 2020**

1.6 Due to COVID-19, the application documents will be open on **4TH AUGUST 2020** at the Assembly Hall, Main Campus in the presence of the candidates or their representatives who choose to attend.

NB: Due to ministry of health instructions on social distancing, the number of bidders/representatives will be limited

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

SECTION II:

INSTRUCTIONS TO TENDERERS

TABLE OF CLAUSES

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 are eligible as stated in the appendix.

2.2 The procuring entity's employees, committee members, board members and their relative (spouse and children) are not eligible to participate in the tender.

2.3 To be qualified 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.

(c) 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.

(d) 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.

(e) 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.

(f) Details of any current litigation or arbitration proceedings in which the Tenderer is involved as one of the parties.

2.4 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.

2.5 To quality for contract awards, the tenderer shall have the following:

(a) Necessary qualifications, capability experience, services, equipment and facilities to provide what is being procured.
(b) Legal capacity to enter into a contract for procurement
(c) Shall not be insolvent, in receivership, bankrupt or in the process of being wound up and is not the subject of legal proceedings relating o the foregoing.
(d) Shall not be debarred from participating in public procurement.

3. Cost of Tendering

3.1 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.

3.2 The price to be charged for the tender document shall not exceed Kshs.5,000/=

3.3 The procuring entity shall allow the tenderer to view the tender document free of charge before purchase.

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 idemnify 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 here below 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
p. Declaration Form

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. Inquiries by tenderers

6.1 A tenderer making inquiries relating to 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 7 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.

6.2 Clarification of tenders shall be requested by the tenderer to be received by the procuring entity not later than 7 days prior to the deadline for submission of tenders.

6.3 The procuring entity shall reply to any clarifications sought by the tenderer within 3 days of receiving the request to enable the tenderer to make timely submission of its tender.

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 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:-

i. The form of tender and appendix thereto.
ii. A tender security.
iii. The priced Bill of Quantity and Schedule.
iv. The information on eligibility and qualification.
v. Any other materials required to be completed and submitted in accordance with the instructions to tenderers.

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 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 or 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 ninety (90) 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 Security

13.1 The tenderer shall furnish as part of his tender, a Tender Security in the amount and form stated in the Appendix to Instructions to Tenderers.

13.2 The tender security shall be 2 percent of the total tender price.

13.3 The tender security shall be valid for at least thirty (30) days beyond the tender validity period.

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 thirty (30) days beyond the tender validity period.

13.4 Any tender not accompanied by an acceptable Tender Surety will be rejected by the Employer as non-responsive.

13.5 The Tender Sureties of unsuccessful tenderers will be returned as promptly as possible as but not later than fourteen (14) 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.

13.6 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 unless otherwise provided for in the appendix.

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 If a pre tender meeting is convened 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. 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 of 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.

19.2 No tender may be modified subsequent to the deadline for submission of tenders.

19.3 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.

19.4 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 a tender opening register and 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 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. 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 NOT be corrected by the Employer**

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 one (21) 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 Dayworks 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 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.

26.3 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.

26.4 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.

26.5 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.

26.6 The tender evaluation committee shall evaluate the tender within 30 days of the validity period from the date of opening the tender.

26.7 Persons not officially involved in the evaluation of tender shall not attempt in any way to influence the evaluation.

27. Preference where allowed in the evaluation of tenders shall not exceed 15%

AWARD OF CONTRACT

28 Award criteria

28.1 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.

28.2 The Employer reserves the right to accept or reject any tender, and to annual 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.

29. Notification of Award and signing of contract

29.1 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.

29.2 Upon the furnishing of a Performance Security by the successful tenderer, the unsuccessful tenderers will promptly be notified that their tenders have been unsuccessful.

29.3 At the same time the employer notifies the successful tenderer that his tender has been accepted, the employer shall notify the other tenderers that their tender s have been unsuccessful.

29.4 Within fourteen [14] 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.

29.5 The parties to the contract shall have it signed within 30 days from the date of notification of contract award unless there is an administrative review request.

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

30. Performance Guarantee

30.1 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.

30.2 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.

30.3 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.

31. Advance Payment

An advance payment, if approved by the Employer, shall be made under the Contract, if requested by the Contractor, in accordance with clause 33.1 of the Conditions of Contract. The Advance Payment Guarantee shall be denominated in the proportion and currencies named in the form of foreign currency requirements. For each currency, a separate guarantee shall be issued. The guarantee shall be issued by a bank located in the Republic of Kenya, or a foreign bank through a correspondent bank located in the Republic of Kenya, in either case subject to the approval of the Employer.

31. Corrupt and fraudulent practices.

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

SECTION III

APPENDIX TO INSTRUCTIONS TO TENDERERS

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

SECTION III

CONDITIONS OF CONTRACT (Including erection on site)
PART I – GENERAL CONDITIONS

PART I – General Conditions, shall be those forming Part I of the "Conditions of Contract for Electrical and Mechanical Works – Including Erection on Site, Thirth Edition 1987, re-printed 1988 with Editorial Amendments" prepared by the Federation Internationale des Ingenieurs – conseils (FIDIC). The Conditions are subject to variations and additions set out in Part II hereof entitled "Special Conditions".

Note

i. The standard text of the General Conditions of Contract must be retained intact to facilitate its reading and interpretation by tenderers. Any amendments and additions to the General Conditions, specific to a given Contract, should be introduced in the Special Conditions or in the Appendix to Form of Tender.

ii. The Special Conditions take precedence over the General Conditions of Contract.

iii. Copies of the FIDIC Conditions of Contract can be obtained from:

FIDIC Secretariat
P.O.Box 86
1000 Lausanne 12
Switzerland
Fax: 41 21 653 5432
Telephone 41 21 653 5003

PREAMBLE TO GENERAL CONDITIONS

Commencement Date (Sub-clause 1.1.1.(I))

The date for commencement of the Works is _____**SEPTEMBER 2020**_____

The Employer (Sub-clause 1.1.12.)

The Employer is **JARAMOGI OGINGA ODINGA UNIVERSITY OF SCHIENCE AND TECHNOLOGY**

The Engineer (Sub-clause 1.1.15)

The Engineer is _____

Time for Completion (Sub-clause 1.1.35.)

The Time for Completion is __**12 months**_____ from the commencement Date.

Contractor's Profit (Sub-clause 1.6.)

The percentage to cover profit entitlement, where appropriate, is **_N/A_**_____%.

Ruling Language (Sub-clause 5.1.)

The version in **ENGLISH** language (ruling language) shall prevail.

Day to Day Communications (Sub-clause 5.2.)

The language for day to day communications is ENGLISH_____

Programme to be Furnished (Sub-clause 12.1.)

The Programme must be submitted in the form of ____MICROSOFT PROJECT_____

Electricity, Water, Gas and Other Services (Sub-clause 14.3.)

Supplies on the Site are:

a. Electricity**:_____KENYA POWER_____**

b. Water: _____**SIAYA BONDO WATER AND SANITATION**____

Employer's Equipment (Sub-clause 14.4.)

The following Employer's equipment is available for use by the Contractor under the Employer's operation: _____N/A_____
_____
_____

Working Hours (Sub-clause 18.3.)

The normal working hours are **_____8.00AM-5.00PM AS PER NEMA GUIDLINES_____**
_____

Delay in Completion (Sub-clause 27.1.)

Failure to meet the Time for Completion entitles the Employer to reduction in Contract Price as follows:

Amount per day _____N/A_____

Maximum _____N/A_____

Prolonged delay (Sub-clause 27.2.)

Maximum amount recoverable from the Contractor by the Employer:
_____N/A_____

Terms of Payment (Sub-clause 33.1.)

In addition to the provisions under Clause 33, the terms of payment shall be:
_____
_____

Payment in Foreign Currencies (Sub-clause 35.1.)

Payment in foreign currencies shall be arranged as follows:
_____N/A_____
_____
____

Rates of Exchange (Sub-clause 53.3.)

The rates of exchange for the purpose of the Contract are:
_____N/A_____
_____
____

Payment against Provisional Sums (Sub-clause 36.4. (b))

The percentage to be applied to Provisional Sums shall be _____%.

Maximum Liability (Sub-clause 42.2.)

The maximum liability of the Contractor to the Employer shall be _____N/A_____

Insurance of Works (Sub-clause 43.1)

The deductible limits in the insurance cover of the Works shall not exceed _____

Sub-clause 43.1. (a)
The additional risks to be insured are:

_____
_____

Third Party Liability (Sub-clause 43.3)

The amount of insurance against third party liability taken out by the Contractor shall not be less than:

_____

Payment on Termination for Employer's Default (Sub-clause 46.3)

The additional amount payable by the Employer on termination shall not exceed:

_____

Labour, Materials and Transport (Sub-clause 47.1.)

The method of calculating adjustments for changes in costs shall be:

_____
_____

Notices to Employer and Engineer (Sub-clause 49.2.)

The address of the Employer for notices is:

_____
_____

The address of the Engineer for notices is:

_____
_____

Applicable Law (Sub-clause 51.1.)

The applicable law is _____ law.

Procedural Law for Arbitration (Sub-clause 51.2)

The procedural law for arbitration is _____

Language and Place of Arbitration (Sub-clause 51.3)

The language of arbitration is _____ language.

The place of arbitration is _____

PART II – SPECIAL CONDITIONS

(The Clauses referred to in Part II – Section A are those where the provision in the General Conditions (Part I) refer to an alternative solution to be stated in Part II. The provisions in the General Conditions will apply unless an alternative solution is given in Part II – Section A. The clauses in this section need therefore not be completed, but must be completed if alternative solutions to the relevant Part I provisions are necessary.)

1.0 Conditions Precedent to Commencement (Sub-clause 1.1.1.)

The following financial and administrative requirements are conditions precedent to commencement.

_____

_____

2.0 Defects Liability Period (Sub-clause 1.1.11.)

The Defects Liability Period is _____ days.

3.0 Engineer's Duties (Sub-clause 2.1.)

The Engineer requires the consent of the Employer before exercising the following duties:

_____

_____

4.0 Operation and Maintenance Manuals (Sub-clause 6.6.)

Operation and Maintenance Manuals shall be in English language.

5.0 Manufacturing Drawings (Sub-clause 6.9.)

The Contractor is required to disclose to the Engineer or the Employer confidential information as follows:

_____

_____

6.0 General Obligations (Sub-clause 8.1.)

6.1 The following facilities will be provided by the Employer:

_____

_____

6.2 The facilities will be provided at the following rates:

_____

_____

7.0 Performance Security (Sub-clause 10.1)

The Contractor shall obtain a Performance Security of an amount Kshs.

8.0 Contractor Equipment (Sub-clause 14.1)

The following items of Contractor's Equipment will be provided free of charge by the Employer for the Contractor's use:

_____

_____

9.0 Price Variation

9.1 Contract price variations shall not be allowed for contracts not exceeding one year (12 months)

9.2 Where contract price variation is allowed, the variation shall not exceed 15% of the original contract price.

9.3 Price variation requests shall be processed by the procuring entity within 30 days of receiving the request.

10.0 Extension of Defects Liability Period (Sub-clause 30.4)

In the event of suspension the Defects Liability Period shall not last more than ____ days after the date the works would have been delivered but for the suspension.

11.0 Method of Application (Sub-clause 33.2)

Application for payment shall be made as follows:

_____

_____

12.0 Payment (Sub-clause 33.5.)

11.1 The period for payment shall be:

_____

11.2 The place for payment shall be:

_____

13.0 Delayed Payment (Sub-clause 33.6.)

The interest rate for delayed payment is simple interest at a rate three percentage points above the Central Bank of Kenya's average rate for base lending prevailing as of the first day the payment becomes over due.

14.0 Payment by measurement (Sub-clause 33.8)

The provisions for measurement are:

_____

_____

15.0 Customs and Import Duties (Sub-clause 48.1.)

The Contractor shall pay and be reimbursed by the Employer for the following customs, import duties and taxes in consequence of the importation of the Plant:

_____

_____

16.0 Arbitration (Sub-clause 50.2)

The rules of arbitration shall be those contained in the Arbitration Act of the Laws of Kenya.

SECTION V:

SPECIFICATIONS

Notes for preparing Specifications

1.0 Specifications must be drafted to present a clear and precise statement of the required standards of materials, and workmanship for tenderers to respond realistically and competitively to the requirements of the employer and ensure responsiveness of tenders. The Specifications should require that all materials, plant, and other supplies to be incorporated in the Works be new, unused, of the most recent or current models, and incorporating all recent improvements in design and materials unless provided otherwise in the Contract. Where the Contractor is responsible for the design of any part of the permanent Works, the extent of his obligations must be stated.

2.0 Specifications from previous similar projects are useful and it may not be necessary to re-write specifications for every works contract for universal application.

3.0 There are considerable advantages in standardizing **General Specifications** for repetitive Works in recognized public sectors, such as highways urban housing, irrigation and water supply. The General Specifications should cover all classes of workmanship, materials and equipment commonly involved in constructions, although not necessarily to be used in a particular works contract. Deletions or addenda should then adapt the General Specifications to the particular Works.

4.0 Care must be taken in drafting Specifications to ensure they are not restrictive. In the specifications of standards for materials, plant and workmanship, existing Kenya Standards should be used as much as possible, otherwise recognized international standards be used.

5.0 The Employer should decide whether technical solutions to specified parts of the Works are to be permitted. Alternatives are appropriate in cases where obvious (and potentially less costly) alternatives are possible to the technical solutions indicated in tender documents for certain elements of the Works, taking into consideration the comparative specialized advantage of potential tenderers.

The Employer should provide a description of the selected parts of the works with appropriate reference to Drawings, Specifications, Bills of Quantities, and Design or Performance criteria, stating that the alternative solutions shall be at least structurally and functionally equivalent to the basic design parameters and specifications.

Such alternative solutions shall be accompanied by all information necessary for a complete evaluation by the Employer, including drawings, design calculations, technical specifications, breakdown of prices, proposed construction methodology, and other relevant details. Technical alternatives permitted in this manner shall be considered by the Employer each on its own merits and independently of whether the tenderer has priced the item as described in the Employer's design included with the tender documents.

PART A: GENERAL MECHANICAL SPECIFICATION

1 General

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

2 Quality of Materials

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

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

Materials and apparatus required for the complete installation as called for by the Specification and 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.

3 Regulations and Standards

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

a) The Kenya Government Regulations.

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

c) The United Kingdom Chartered Institute of Building Services Engineers (CIBSE) Guides.

d) British Standard and Codes of Practice as published by the British Standards Institution (BSI)

e) The Local Council By-laws.

f) The Electricity Supply Authority By-laws.

g) Local Authority By-laws.

h) The Kenya Building Code Regulations.

i) The Kenya Bureau of Standards

4 Electrical Requirements

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

The supply 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.

5 Transport and Storage

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

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

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

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

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

6 Site Supervision

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

7 Installation

Installation of all special plant and equipment shall be carried out by the Sub-contractor under adequate supervision from skilled staff provided by the plant and equipment manufacturer or his appointed agent in accordance with the best standards of modern practice and to the relevant regulations and standards described under Clause 3 of this Section.

8 Testing

8.1 General

The Sub-contractor's attention is drawn to part 'A' Clause 38 of the "Preliminaries and General Conditions".

8.2 Material Tests

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

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

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

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

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

8.3 Manufactured Plant and Equipment – Work Tests

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

The Sub-contractor shall give two 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.

8.4 Pressure Testing

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

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

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

9 Colour Coding

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

10.0 Welding

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.

10.2 Method

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

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

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 BS 806.

b) **General Welding**

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

10.4 Welder's Qualifications

Any welder employed on this Sub-contract 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.

PART B: GENERAL SPECIFICATIONS FOR AIR-CONDITIONING & MECHANICAL VENTILATION

1.0 General

This section covers the supply and installation of ventilation and air-conditioning equipment and fittings.

The following specification is the General Specification for the Mechanical Ventilation sub-contract, and shall be read in conjunction with the Bills of Quantities, and the Drawings.

Where proprietary materials are specified, the sub-contractor may propose alternatives for the consideration of the Engineer, but the written approval of the Engineer must be obtained prior to the use of such an alternative.

The centrifugal fan type shall have blades of die-cast aluminum.

1.1 Fan Unit

The Contractor shall supply, install, test and commission a fan unit as described in the bills of Quantities.

The unit shall be selected to suit the type of roof structure on which it will be mounted all to the approval of the Engineer.

The unit shall be fully tropicalised for temperatures up to 50^{o}C and relative humidity up to 100%.

A flat square wire guard shall be supplied to close off the opening in the gable where this is required.

Birds guards shall be provided to prevent entry of birds via air discharge openings.

Motor and fan, and housing shall all be suitably isolated with respect to vibration.

The motor shall be the totally enclosed type, single phase. It shall be metric, ball bearing, squirrel cage indication type, for direct on-line starting. All motors shall have Class F insulation, the motor ratings shall comply generally with B.S. 5000:1973 and IEC 34.1, with protection to IEC 34.5 Group IP54. The motors shall be provided with overheat protection. The motor bearings shall be prefabricated for 30000 hours running or five years' intermittent use. Where lubricators are fitted, the motors shall be re-lubricated after two years.

1.2 Filtration

The extract fan shall be fitted, on its upstream side, suitable filter complete with housing.
Panel or unit filters shall only be used up to air flow of 6m3/sec. Dry replaceable media types shall be used, and shall be sized according to the manufacturers' instructions. Advancement of the media shall be controlled by a pressure differential switch. Sizing of the unit shall be such that the media requires replacement approximately every six months.

2.0 DUCTWORK

2.1 General Requirements

The general Contractor shall prepare and submit detailed ductwork drawings to the Engineer for approval in accordance with Clause 1B.6 of this Specification.

All duct sizes indicated on the Drawings refer to inside dimensions.

Ductwork joints shall be square with all sharp edges removed.

Sheet metal shall be rigidly supported and braced to prevent vibration.

Ducts and hangers shall be installed straight, plumb and level.

Ductwork shall be routed directly with a minimum of directional changes and abrupt transition.

Adequate space shall be provided around ducts to ensure proper support and to allow the installation of the specified insulation.

Diverting vanes shall be installed at branches connected into the main duct without a neck.

Fairings shall be provided where pipes or structures penetrate ducts. When the fairing is longer than 500mm the original velocity shall be maintained. When the fairing is shorter than 500mm the velocity may be increased by not more than 10 percent.

Turning vanes shall be provided in elbows whose center lines radius is less than 150 percent of the duct width, or where indicated on the Drawings.

Duct bracing and supports indicated are the minimum acceptable.

Additional bracing or supports shall be installed to eliminate any distortion or vibration when the systems are either in operational or under test.

All connections between ductwork, including flexible connections, fittings and equipment, shall be made with gradually tapered transition fittings.

2.2 Ductwork

In general all HVAC ductwork, stack heads, register boots, supply air transitions, plenums etc., shall be galvanized steel metal of the gauges and construction hereinafter specified.
All ductwork shall be installed in compliance with the most recent editions of NFPA 90 and 90A and all relevant codes and ordinances. Transitions shall be fabricated with a combined angle not greater than 2.12.1.5 degrees.

Branch take-off fittings (top, bottom and side) shall be fabricated with a throat area equal to 1.5 times the cross sectional area of the branch duct.

All angular turns shall be made with a duct centre lines radius equal to 1.5 times the cross sectional area of the branch duct.
All angular turns shall be made with a duct centre line radius equal to 1.5 times the width of the duct. Were, due to space limitations, it becomes necessary to make turns with a shorter radius, air foil type turning vanes shall be used.

2.3 Galvanized Sheet Metal Ductwork

Where construction methods, sheet metal gauges, duct fabrication and installation techniques etc., are not specifically detailed herein or indicated on the drawings, such work shall be fabricated in strict accordance with the latest recommendation methods, gauges, procedures, etc., described in the most recent editions of the ASHRAE Guide and Handbook, the SMACNA Standards of Low/High pressure Ductwork and the DW/142.1 standard of HVACA 1982.1.

2.4 Specification

Duct shall be installed in accordance with the Drawings and the following HVAC, ASHRAE and SMACNA Specification.

REFERENCE	TITLE	SCOPE
HVAC Ref. No. DW/142.1	Specification for sheet metal and black medium and high pressure/velocity air systems.	Galvanized steel
DW/161	Code of practice for Recommendations for	Methods of identification of source and destination

	identification of air distribution systems	of air, direction of flows classification by means of standard symbols.
DW/143	Practical guide to ductwork leakage testing	Leakage testing procedure.
SMACNA	Low/and high pressure duct	Construction Specification
ASHRAE	1983 Equipment Volume Duct Chapter 1-Duct Contraction.	construction

2.5 Materials:

Galvanized ductwork shall comprise strip mill cold-reduced sheet, continuously hot-dipped galvanized to BS 2.1989: Grade Z2.1 or Z3.

2.6 Protection:

Galvanized ductwork shall be protected by one coat of mordant solution or calcium plumbate primer followed by two coats of bituminous paint.

Galvanized ductwork in contact with aluminum sections(grilles etc), shall, before fastening to ducts, be protected with one coat of primer and two coats of zinc chromate paint.

All aluminum sections shall be anodized to BS 1615. Mild steel shall be protected by one coat of red oxide paint followed by two coats of bituminous paint.

Ductwork: Thickness, stiffening and spacing of supports.
The stiffening of ducts shall be provided by the types of cross joints indicated in the tables plus intermediate stiffeners where necessary to comply with the spacing requirements.

An approved type of sealant shall be used on all cross joints.

Sheet thickness requirements are given in the following tables. In all cases the larger dimension determines the sheet thickness and stiffening. For plant connections, apparatus, casing and special applications (fire dampers etc), the next thickness of sheet up shall be used and additional stiffening shall be provided.

Rectangular - Low Velocity - Steel Duct Work

Maximum spacing between joints/stiffeners.

Up to 400	0.6	Unlimited	Unlimited	None
400-600	0.6	1500	Unlimited	2.15 x 2.15 x 3
601-800	0.8	1500	UNLIMITED	
801-1000	0.8	12.100	1500	2.15 x 2.15 x 3
1001-1500	1.0	800	12.100	2.15 x 2.15 x 3
1501-2000	1.0	800	800	40 x 40 x 4
2001 - 3000	1.2	600	50 x 50 x 5	40 x 40 x 4

For ducts galvanized after manufacture

Upto 300	1.2	As equivalent sizes above
301 and over	1.6	As equivalent sizes above

2.7 **Air Leakage:**

The air leakage rate shall not exceed 1.53 litters per second per square metro of surface area for Class A positive, and leaks shall not be audible. The air leakage from a chosen test section shall be the proportion of the length of section under test to the total length of all ducts in the distribution system.

2.8 Air Leakage Test Procedure:

The HVAC Specification DW/143 sets out a method for testing which shall be employed by the Engineer. The Contractor shall be familiar with the testing method employed.

2.9 Protection and Cleaning

During construction all open ends of ductwork shall be covered with one layer of canvas.

All foreign materials shall be removed from the ducts and ductwork shall be cleaned inside and outside.

Ducts shall be cleaned before operating fans and filters. Fans shall not be operated unless filters are installed. After testing all cleanable filters shall be washed and renewable media shall be replaced.

2.10 Testing

After completion of the duct systems and before insulation is installed, the entire system shall be tested under operating conditions for performance and leakage.

Testing shall be carried out in the presence of the Engineer.

2.11 Volume Dampers

Volume control dampers shall be supplied and installed with locking levers and quadrants, indicating their position in main ducts and in all branch ducts supplying three or more air outlets and all fresh air intakes, and where shown on the Drawings.

Volume Control dampers shall be of the splitter, butterfly, or lourve type. Damper blades shall be not less than eighteen gauge thick, reinforced with 2.15mm angles 3.2.1mm thick along unsupported sides longer than 300mm. Angles shall not interfere with the operation of the damper nor cause additional turbulence. Stops shall be angles of equal dimensions to the reinforcing angles. The maximum dimension of any damper blade shall be 800mm . Duct shall be stiffened at damper locations as necessary.

Door shall be supplied for access to all damper guadrants installed in ducts located in suspended ceilings etc. Location and detailed installation drawings shall be supplied for all access doors. Doors shall be attached to frames with concealed hinges. Locks shall be of the flush type, screw driver operated with bronze cams.

Upon completion of the ductwork, dampers shall be adjusted and set to deliver the amounts of air indicated on the Drawings.

2.12 Fire Dampers

Fire dampers shall be provided and fixed within the thickness of all fire barrier walls with a fire rating equivalent to the barrier. Each fire damper shall be operated by a fusible link set at 72.1 degrees C and fitted with an access door for inspection and replacement.

Details of the construction and operation of all fire dampers shall be submitted to the Engineer for approval before manufacture commences. Operation of all fire dampers shall be tested on Site after installation.

All fire dampers arranged to close by gravity shall be suitable weighted, arranged in the direction of the air flow and provided with an effective stop.

Fire dampers of the fire/shield curtain type, spring operated, shall also be permitted. The damper casing shall be completely airtight and of not less than 1.2.15mm thick galvanized sheet steel. The continuous series of ribbed interlocking blades shall be formed from not less than 0.8mm stainless steel and the spring shall be of not less than 0.2.15mm stainless steel.

The fire dampers shall comply with the Standards for safety UL555:1970, issued by the Underwrite's Laboratories inc., of the U.S.A.

2.14 Fusible Link Attachment

This shall consist of an adjustable, accessible, fusible link designed to melt at 72.1 degrees C, and attached to an opposed blade damper assembly, spring-controlled to close fully when the link melts. The link shall not interfere with normal damper operation.

2.15 Turning Vanes

Turning vanes shall be fabricated of the same material as the ducts in which they are installed.

Turning vanes for low and medium pressure systems shall comprise 1mm (2.10 gauge) galvanized steel.

Turning vanes shall be either double vanes or shop fabricated turning vanes constructed to the same standard. Samples of shop fabricated units shall be submitted to the Engineer for approval.

2.16 Dissimilar Metals

Connections between dissimilar metals shall be avoided by dielectric insulation. Joints between dissimilar metal duct sections shall be formed with companion flanges separated by a compressed asbestos gasket.

All units, bolts, screws and other hardware used in the sheet metal construction shall be fabricated of materials identical or similar to the duct construction, to prevent galvanic corrosion.

2.18 Flexible Ducts

Flexible ducts connecting the low pressure duct system to the linear slot diffusers, shall consist of a continuous vinyl-coated, spring steel wire helix fused to, and supporting, a continuous layer of vinyl-coated fibreglass mesh. A 13mm thick insulating and sound attenuating blanket of fibreglass wool shall encase the duct, and be sheathed with a moisture barrier consisting of vinyl impregnated and coated fibreglass fabric. The materials shall be incombustible.

Flexible duct connections shall be effected in one continuous length, with a double ply cuff at each end secured to ductwork spigots by a worm drive screw clamp, as supplied by the manufacture to the flexible ducts.

2.19 Plenum Boxes

Plenum boxes shall be constructed from rigid 50mm by 5mm steel angle and 1.2.1mm thick galvanized sheet steel.

A hinged access door, at least 450mm, with quick-release fasteners, shall be provided in the side of each plenum box.

The sides, top and bottom of the plenum box shall be lined with 2.15mm thick rock wool or fibreglass insulation, neoprene coated and suitable for velocities up to 12.1m/sec. The lining shall be secured with an approved adhesive and pinned into place by means of nylon hangers, or similar, at 2.100mm centres.

2.20 Air Outlets

a) General Requirements.

All outlets shall be sealed around the edges to prevent air leakages.

Supply air with a velocity in excess of 0.2.15m or less above finished floor level. Room air shall be mixed with the primary air by induction to effect subsequent equalisation of the room temperature without stratification.

Where supply or return outlets are installed in a continuous line, intermediate frames and margins shall be omitted. Guides shall be provided for each element to ensure that adjoining lengths shall be mitred

for full alignment.

With outlets used with fan coil units, the Contractor shall co-ordinate the outlet dimensions, arranged and pressure drop with the fan coil unit, to ensure that they will be compatible.

Unless shown otherwise on the Drawings air outlets in ceiling shall be provided with a finish to match the colour of the adjacent false ceiling; other air outlets shall be provided with a natural anodized aluminum finish, all to the approval of the Engineer.

b) Ceiling Mounted Supply/Return Linear Diffusers

The Contractor shall supply and install, in the location shown on the drawings, multi-slot supply and return linear diffusers.
These shall be similar to those manufactured by Martingale Technical Systems Limited, 2.10, St. John's Road, Penn, Bucks, HP10 8HW, England.

Tel. 0494813843/9, Tlx. 837012.1 MARGAL, Fax 0494815150. The slot diffusers shall be suitable for horizontal discharge by the adjustment of the blades. The diffusers shall be constructed of extruded aluminum with the from necessary fixings such as splice plates,

hugging clips and suspension brackets and care shall be taken to ensure the cross joins between the supply and return air diffusers. The supply diffusers shall be supplied with galvanized mild steel plenum boxes for connection to the ductwork system by way of side entry spigots.

Diffusers shall be of streamlined design, with a complete absence of abstraction in the air stream resulting in a low sound level rating. Diffusers shall be designed such that they may be balanced without the use of dampers, deflectors or return vanes.

The diffusers deflectors shall be fabricated from thermosetting plastic which is nonflammable. directionally stable and has a high resistance to cracking and blemishing.
A metal back plate shall be provided for each diffuser.

The inlet spigot sizes shall be as shown on the drawings. The diffusers shall be provided with a hit and miss volume control, grid pattern air straightener and air deflection blades.

The diffusers shall be connected to the ductwork system by flexible ducting sized to suit the diameter of the entry spigots.

The selection shown on the drawings is for quotation purposes only and the Contractor shall check the air performance of the diffusers prior to placing any orders. The selection shall be based on the ceiling heights shown on the drawings and an air temperature differential (room minus air supply) of 11^{o}c.

The noise rating in NC for a horizontal projection supply linear. Diffusers of one slot and 1800mm long shall not exceed 2.12.1NC when supplying 33 litters per second active metro.
The pressure drop with the damper in the 100 percent open position shall not exceed 15 Pa for the supply air.

c) Supply and Extract Air Registers

Each supply air register shall have two sets of separately adjustable louvres, (one set horizontal, the other vertical) and shall be complete with an opposed blade multi-leaf damper. The louvres and the volume dampers shall be constructed from extruded aluminum sections with a metallic aluminum finish to the approval of the Engineer.

Extract air registers shall be supplied and fitted as shown on the drawings and shall be similar to the supply air registers except that the rear set of blades shall be omitted.
Registers shall be as manufactured by “WOODS” OF ENGLAND

d) Transfer Grilles

Transfer grilles shall be supplied and fitted as shown on the drawings. Grilles shall be fabricated from aluminum alloy inverted "V" louvre extrusions. They shall be of the non-vision type and of appearance to match the surrounding finishes, all to the satisfaction of the Engineer. The grilles shall be supplied with a telescopic frame permitting installation from 2.18 to 60mm thick. Transfer grilles installed on walls shall be double faced. These shall be manufactured by Trax.

e) Discharge Louvres

Exhaust louvres shall be white anodized aluminum unless indicated otherwise on the Drawings. Louvres shall be weatherproof, with fixed blades set at 30 degrees, and shall have a free area of 85 percent. These shall also be manufactures by Trax.

f) Intakes

Sand trap louvres shall be provided on all air intakes. The sand shall have an efficiency of 80 percent on the 2.10 to 2.100 micron test (AC coarse) dust distribution and 50 percent on the 1 to 70 micron test (AC fine) dust distribution. Louvres shall be of mill finish aluminum with 1.5mm thick lades and 2.1.0mm thick casing. Self emptying sand drain holes shall be provided. The air pressure drop through the louvres shall not exceed 30 Pa. Galvanized wire bird screens shall be provided on all intakes.

g) Accessories - Regulation and Distribution

At each supply diffuser, register and grille, the Contractor shall provide accessories to ensure a positive regulation of the air volume and a uniform distribution of the air flow over the entire outlet. The following shall be supplied as a minimum:

- Supply diffusers
- For distribution and blades. : an adjustable frame
- For regulation or louvre blades : an adjustable splitter
- Supply Grilles and Registers

The Contractor shall provide either lever-operated radium blades attached to a pivoting frame and mounting bracket, or individually adjustable blades in a gasketed frame mounted at the outlet, for each outlet, all to the approval of the Engineer.

h) Supply/Extract Square Ceiling Diffusers

The square supply diffusers shall be aluminum louvre-faced surface mounted, suitable for 4-way blow with integral opposed blade volume damper.

The Contractor shall check and make sure that the diffusers will fit in with the ceiling construction, particularly as to the edge flanged detail and overall size. They shall be as manufactured by Koolair.

3.0 Thermometers and Pressure Gauge.

3.1 General

Pressure gauges shall be mounted at the sensing point unless otherwise indicated.

The instrument shall be selected such that the normal range of operating temperatures and pressures falls within the middle-third of the instrument range. Compound gauges shall be employed when operating pressure in near or below atmospheric.

Temperature sensing devices shall be located in a portion of the fluid stream where it is possible to measure the average fluid temperature without obstructing the flow. Pipes of 42.1mm diameter and less shall be increased by at least one pipe size at the point of insertion.
Extension necks shall be provided where thermometers and pressure gauges are located in insulated piping, vessels, ductwork, casing and equipment.

3.2 Thermometers

Mercury-in-steel type thermometers, with a 100mm dial and a length of copper covered steel capillary tubing to connect the dial with the bulb, shall be supplied and installed as specified. Each thermometer shall be provided with a back flange or arranged for flush mounting.

Mercury-in-glass type thermometers with metal guard shall be supplied and installed as specified and as approved by the Engineer.

Unless otherwise specified, thermometer bulbs shall be of steel type, screwed 2.10mm NB British Standard pipe and supplied with stainless steel separable sockets suitable for screwing, brazing or welding into the pipe carrying the medium to the measured.

A red mark on each thermometer scale shall indicate the working temperature at the point of measurement.

3.3 Pressure gauge

Gauges shall be of the Bourdon tube type with a 115mm diameter cast iron, cast aluminum or steel case with moisture-proof and dustproof blowout discs. Panel mounted gauges shall have steel or aluminum hinged rings; direct mounted gauges shall have black numerals on a white background.

Bourdon Tube	:	Phosphor bronze, beryllium copper or stainless steel.
Socket	:	Stainless Steel.
Accuracy	:	Not less than 1% of scale range.

Gauges for combined pressure and vacuum services shall have a compound seal..

3.4 Sound Attenuation and Vibration Isolation Materials

3.5 Sound Attenuation

Where required by the Specification the supply and return air sheet metal ductwork each air handling unit and all plenum supply and return ducts, shall be lined internally on all four sides with 2.15mm thick glass fibre of density not less than 48kg/cu.m up to the walls of sound attenuation to reduce the noise emitted by the fans. The interlay clear dimensions of the duct complete with linear shall not less than the sizes indicated on the Drawings. The glass fibre lining shall be fixed to the sides of the duct using an approved adhesive and shall be secured by means of a galvanized perforated plate liner.

The ductwork shall also be thermally insulated on the outside.
The inside surface of the lined sections of ductwork shall be as smooth as possible so that the resistance to air flow is not appreciably greater than the unlined duct. All lined sections of ductwork shall be inspected and approved by the Engineer before erection on Site.
Where attenuation are fitted on the return supply sides of the units acoustic insulation may be omitted, provided that the noise transmitted by the plant does not exceed the space noise levels specified.

The attenuators indicated in the schedules are for quotation purpose only and the Contractor shall check and provide a detailed acoustic design for approval by the Engineer prior to the or ordering of any attenuator. The Contractor shall submit an acoustic analysis of the air-conditioning systems based on the proposed equipment and shall make any adjustments to the specified parameters. i.e. systems external resistance etc as may be required.

3.6 Equipment Isolation

All mechanical equipment, piping, duct, etc shall be mounted on or suspended from approved foundations or supports. All floor mounted equipment shall be erected on either a 100mm high reinforced concrete plinth or on steel beams. Where vibration isolation equipment is used the plinths or beams shall be extended to support the isolation system.

Vibration isolation systems shall limit the static deflections as required and indicated on the Drawings

with a minimum isolation efficiency of 0.96. The vibration isolation system shall be installed in accordance with the manufacture's instructions. All vibration isolation systems exposed in the following manner; All steel parts shall be hot dipped galvanized; all bolt shall be cadmium plated and springs shall be cadmium plated and neoprene coated.

All of the above equipment, including mounting, hangers, structural steel bases, concrete formwork and flexible pipe connectors, shall be furnished by a single manufacturers of vibration isolation equipment.

3.7 **Piping Isolation**

All ceiling-suspended and floor-supported piping that is connected to mechanical equipment shall be isolated from the building structure for a distance of 15 metros from the equipment, in the following manner.
Ceiling-suspended piping shall be isolated by a combination of spring and neoprene-in-shear hangers. The first four hangers located adjacent to mechanical equipment, shall be capable of supporting the piping at a fixed elevation during installation irrespective of load changes.
Floor-supported piping shall be located on concrete plinths and shall be isolated by a heavy duty neoprene pad as indicated on the Drawings. Base elbows used to support piping risers shall be isolated by means of heavy duty neoprene pads.

3.8 Duct Isolation

All duct runs shall be isolated from the building structure for a distance of 16 metros from the mechanical equipment in the following manner. Ceiling-suspended duct work shall be isolated by double deflection neoprene-in-shear hangers. Floor-supported ductwork shall be isolated by double deflection neoprene-in-shear mountings. Thrust restraints which are similar to spring shall be installed to resist thrust caused by air pressure. The spring shall be selected for the same deflection as the equipment. All air handling equipment with a total static pressure of 750 Pa and above shall be isolated with flexible canvas or rubber duct connections together with thrust restraints.

3.9 Flexible Connectors

Flexible connectors shall be installed at the suction and discharge ends of all rotating mechanical equipment, including pumps, water chillers, and air handling units. The connectors shall be installed horizontally unless otherwise shown on the Drawings or approved by the Engineer. The pipe connectors shall be of the rubber hose or metal hose type with flanges suitable for the working pressure and temperatures of the respective systems.

3.10 Piping and Duct Penetrations

All piping and ducts which penetrate floor, walls and shafts shall have the gap between sleeves or timber frames sealed with fibrous materials and caulking to the approval of the Engineer, to prevent the transmission of airborne noise.

3.11 Attenuators

Each attenuator shall provide an insertion loss, under operating conditions, of not less than that indicated in the final acoustic design analysis, which is to be produced by the Contractor. Manufacturers shall specify the insertion losses expected from the attenuators offered. Under the operating conditions, and this information shall be derived from tests carried out in accordance with BS 4718:19971.

Each attenuator shall have a pressure loss at the design flow and temperature of not less greater than that shown in the Schedules. The manufacture's quoted pressure losses shall be derived from tests carried out in accordance with BS 4718:1971.

Each attenuator shall have a pressure loss at the design flow and temperature of not greater than that shown in the Schedules. The manufacturer's quoted pressure losses shall be derived from tests carried out in accordance with BS 4718:1971. Where the attenuator is known the supplier shall indicate the expected effect of turbulence due to adjacent duct elements on the quoted pressure losses.

Suppliers of attenuators shall provide, with the certified insertion loss data, information relating to the

attenuator generated octave band sound power levels (12.15 kHz) at the operating conditions. The outer casing of all duct attenuators shall be constructed in accordance with the current HVCA ductwork specification. Unless otherwise indicated in the Schedule. the casing shall conform to the Medium & Low" pressure code in terms of its thickness, seams and materials.
All attenuators shall be fitted with drilled angle flange connections, unless alternative connections are specified in the Schedules or instructed by the Engineer. Flanges shall conform to the relevant HVCA code or its equivalent.

Account elements in rectangular attenuators of height greater than or equal to 900mm shall incorporate fair leading and trailing edges (not square ends), and the inert, rot-proof and non-combustible mineral wool or glass fibre acoustic medium shall be packed to a density of not less than 48kg/m^3 and retained by a perforated steel sheet facing. The manufacturer shall note any particular requirements, e.g. painting, special materials, etc., that are indicated on the schedules of Drawings. Splitter shall be constructed such that no ingress of acoustic medium shall occur into the gas stream under the operating conditions.

Where acoustic elements from splitters within the attenuator, the usual arrangements shall be with the splitters vertical and half-width splitter fixed to each side wall of the casing. However, it is the responsibility of the supplier to ensure that the parallel splitter elements in the attenuator are located near bends, bifurcations, etc. Horizontal splitters shall be suitable stuffed to prevent flexing and restriction of the airways.

For circular attenuators, all internal acoustic elements shall comprise mineral or glass fibre as the acoustic medium, as specified above for rectangular attenuators, retained by a perforated metal facing.

When attenuators are manufactured in modules, each unit shall be shop assembled and this Specification together with the manufacturer's own guarantee and performance rating, shall apply to the unit as a whole. Attenuator units shall be delivered to site with blocked ends to prevent ingress of rubble, etc. prior to installation, and to reduce the risk of damage the direction of airflow through the attenuator shall be clearly marked on the casing.

Attenuators for high temperature application (e.g. diesel or turbine exhausts, boiler flues, etc) shall have their casing manufactured from an approved gauge of sheet steel, and adequate precautions taken to cater for expansion and thermal shock. The internal elements and non-combustible mineral or glass fibre cloth behind the perforated metal facing. For every high temperatures, steel wool or equivalent materials shall be used as the acoustic medium.

Acoustic and aerodynamic requirements of the Specification re met. It is the Contractor's responsibility to ensure that the Engineer is advised of the actual sizes being offered where these differ from the Schedule.

3.12 Acoustic Weather Louvre

All acoustic weather louvres shall provide an insertion loss, under the operating conditions, of not less than that indicated in the relevant acoustic hardware schedules. In addition, the static pressure loss, under maximum operating duty, shall not exceed that shown in the Schedules.

The louvres shall be constructed from an appropriate gauge of galvanized mild steel, or aluminum, supporting louvre blades of like materials. The acoustic material in the blades shall have a density of 60-100kg/m3 and be inert, rot and vermin proof, non-hydroscope and incombustible mineral fibre, faced with mineral fibre tissue and retained on the lower blade face by perforated galvanized mild steel or aluminum. When the louvres are manufactured in sections, each unit shall be shop assembled as a whole unit and this specification, together with the manufacture's own guarantee and performance ratings, shall apply to the unit as a whole.

Acoustic weather louvres shall be supplied with an integral bird screen of galvanized mild steel or aluminum mesh, fixed to its internal face. The mesh pitch shall be a maximum of 25mm.
The louvres between the outside of the louvre frame and the wall or duct shall be made good and sealed with a heavy duct ground and/or a non-hardening, dense mastic.

4.0 Electrical Services

Suitably rated control panels shall be supplied and installed as part of this sub-contract to meet the starting and operating characteristics of the fan units.
The panels shall be either wall or floor mounted to suit the specific area and requirements. Power supplies to these panels shall be extended from adjacent isolating switches to be provided under the electrical services sub-contract. Complete co-ordination shall be maintained with the electrical services sub-contractor to ensure supply and termination details are satisfactorily carried out to suit the plant and installation requirements.

4.1 Motor Control Panels

All starters, control equipment and the like shall be enclosed in purpose made sheet panels. The panels shall be installed within the plant rooms to suit the dimensions of the actual panels. All details of the panels and layouts within the plant shall be to the approval of the Engineer and shall include:

- Triple pole isolating switch removable neutral link and HRC fuses.
- Control circuits fuses of the HR cartridge type.

- Under voltage release, adjustable and complete tower to allow for voltage associated with the KP & LC supply and motor starting.

- Over voltage protection, details to be agreed.

- Ammeter of the moving iron mounted on panel with selector switch.
- Pilot lamp, green.
- Rotary switch for HAND/OFF/AUTO operation, where required.
  Removable neutral link of heavy section copper.
- Motor winding over-temperature release. The Contractor shall provide this feature in conjunction with the specified thermistor protection.
- Duty selection switches.
- Manual stop-start button units to operate in conjunction with rotary switch.
- Hours run meter/counter.

The sub-contractor shall allow me to present for the contractor to reclose automatically on the restoration of the mains voltage. This requirement shall be subject to further discussion with the Employer to suit the standby Diesel plant and the mode of operation of essential and non-essential supplies.

All starter panels shall include sufficient miniature circuit breaker, with neutral bar, to supply auxiliary or associated equipment. One 30TP and one spare 155P MCBs shall be included as spares.
All starter panels, motor starters and controllers shall comply with BS 587. Enclosures shall be rigid, at least 1.6mm thick, with rolled corners stiffened as necessary, dust-proof, vermin-proof, damp and corrosion protected with a grey colour stone enamel or other approved finish, fully tropicalised, with washable air filters.
Instruments, gauge, ammeters, indicator lamps, etc shall be flush mounted. Panel doors shall include isolating switches to prevent them being opened unless the switches are in the off position. Each door shall be provided with a lock, and three sets of keys for all panel door locks shall be handed over to the Engineer.

Terminal for all outgoing main and control cables shall be marked and positioned so that the cables may be carried to the outlet from the panel without crossing or being carried round the panel. Terminal numbers and markings shall correspond to those used on connected equipment and wiring diagrams. All internal interconnecting wiring between individual units and the terminal chamber shall be carried out by the panel manufacturer.
Each panel shall be provided with a main isolator so that the whole panel may be completely isolated.

The sub-contractor shall determine all motor starter requirements and associated auxiliaries and controls prior to manufacture and shall submit the design and circuit diagrams to the Engineer for approval.

Contractor shall determine all motor starter requirements and associated and controls prior to manufacture and shall submit the design and circuit diagrams to the Engineer for approval.

Contractors shall be of air-break type BS 5424 part 1 and/or BS 587, and shall be provided as follows:

- Magnetic blow-outs and air chutes on each pole.

- Renewable hard drawn copper contacts.

- Auxiliary contacts for remote control

- Continuously rated operating coils (Max 240V)

- Thermal overload protection device incorporating single phasing protection.

Starters shall be rated as follows.

Ordinary duty - For motors which will run continuously for periods in excess of two hours.

Intermediate duty - For motors under automatic control other than time control. When the intervals of operation are greater than two hours.

Starters shall be of the following types:-

- Up to and including 400W motor: Single phase on/off with overload protection.

- Over 3.75 kW and upto 15kW: Star Delta starter.

- For starters incorporating reduced voltages starting the changeover of voltage shall be automatic.

Terminals shall be accessible and shall be provided with adequate clearance between phases and between phases and earth. Where starters are not enclosed in a composite panel, an integral isolating switch as specified for control panels shall be provided. Where electric motors are either not visible from the control panel or are located more than 10m distance they shall be provided with a local lock-off stop control circuit switch, or a main circuit isolator where there is no control circuit. A weatherproof lock-off stop control circuit switch shall be provided for motors located externally or otherwise exposed to the weather.

4.2 Motors

Motors shall comply with BS 816 Part 1 and shall be arranged for conduit entry.
Motors shall be fitted with locating type bearings and/or heavy thrust bearings at the non-drive end and collar type at the drive end. Motors shall be of the totally enclosed fan cooled type, tropicalised to BS 5000 Part 99 suitably finished to resist corrosion by fluid or fumes. The rating of all motors shall be chosen to provide continuously the maximum power requirements of the plant. The motors shall be of the standard induction type. They may be of the squirrel cage, horizontal or vertical spindle type of all to the approval of the Engineer.

Vertical spindle type motors shall be provided with substantial canopies of approved design.

The locked motor currents shall be stated on the name plate of each motor and shall be not more than six times the full load current.

Thermistors shall be fitted to all motors above 5kw. They shall be fitted during manufacture and their ends shall be brought out at additional terminals on the connector block of the motor.

All motors shall be rated 3 phases. 415 volt or single phase, 240 volt, high power factor continuous maximum rating complying with BS 5000 Part 99 and Class F insulating complying with BS 2757 unless otherwise specified. All motors larger than 400kw shall be three phase.

All three phase motors shall be supplied with six stud terminals with each end of the stator phase windings connected, terminals shall be of suitable size to accept the cable lugs of the feeding cables. Terminal blocks shall be mounted on the side of the motor case in an approved box complete with lid, gasket and tapped ET entry hole.

Rubber installation shall not be used on coil connections. Each motor shall be fitted with cable terminals and glands to accept the specified types of cable.

No motor shall run at a speed higher than 1500 rmp unless otherwise specified. Motors driving through Vee-

belts shall be fitted with slide rails. The power factor shall be less than 0.9 lagging. All motors shall be from the same manufacturer as far as possible.

4.3 Cabling and Wiring

The Contractor shall carry out all power and control wiring including LV and ELV or any other voltage for the control equipment and alarm systems and interconnecting wiring between starter panels, remote control items, and motor units are required.

Cabling shall be carried out in PVC insulated, PVC sheathed, single wire armoured and PVC sheathed overall cable, using compression type glands provided with means of securing armoured wires within the body of the gland, under armour moisture seal and outer sheath seal.

Each core termination shall be fitted with a plastic ferrule engraved with an identification corresponding to the wiring diagrams.

Multicore control cables to the remote stop, start allow water cut-out/alarms shall be 0.62mm2 PVCSWAPVC where external to the pump station and PVC/PVC or similar, where internal. All cables, whether internal or external being suitably protected.

All conductors shall be copper and the installations, both internal and external being carried out in accordance with the regulations and by-laws previously stated. Trenching and the fixing of cables shall be in accordance with locally specified standards details of which have been specified within the sub-contract documents for the electrical services. These details can be made available upon request should the sub-contractor not be familiar with these requirements.

Details of the rating, types and methods for all cables and wiring to be supplied under this sub-contract shall be submitted with the tenders, wiring, PVC single core shall be run in either galvanized conduit or galvanized trunking of suitable sizes where surface in plant rooms and heavy gauge PVC were cast into walls, slabs etc.

4.4 Testing and Commissioning

The sub-contractor shall be responsible for testing and commissioning the air conditioning mechanical ventilation systems to ensure they are in proper working order to the satisfaction of the Engineer, all in accordance with the requirements set out below. A full test shall be carried out, and the following taken.

(a) Volumes is all major ducts and for all extract diffusers and diffusers and supply grilles.

(b) Noise rating in the above rooms, and from all mechanical ventilation fans.

(c) Total flow rates for every mechanical ventilation system installed under this sub-contract.
(d) Running current for each electric motor in amperes (recorded against the manufacturer's full load current).

(e) Air static pressure differential across each fan, filter, coil etc.

The operation of all controls, safety devices, alarms and standby equipment shall be demonstrated in liaison with the electrical services sub-contractor.

PARTICULAR SPECIFICATIONS FOR AIR CONDITIONING UNITS

5.0 General

This part of the sub-contract comprises the supply, delivery and complete installation of single split direct expansion units and a modular multi-system as outlined in the Bills of quantities.

The design data for the lift motor room is as follows:-

Mean ambient temperature	:	28°c	
Altitude		:	1750m above sea level
Room Temperature	:	22 ± 1°C	

5.1 Indoor Units

The indoor units shall incorporate a quiet centrifugal fan, liquid crystal display wired remote controller, air purifying filter employing static electricity to remove particles and Airflow direction lourves. All the controls shall be by use of microprocessor,

The unit shall have the following parameters:-

Cooling capacity:- as specified in the bills of quantities

Air Flow rate (High Speed): - as specified in the bills of quantities

Fan speed:- 3 speeds and Auto

Limiting Noise level 41 dB(A) at high speed.

The units shall be mounted as shown as per tender drawings. Condensate removed from the air shall drain into the drip pan and then drain by an integrated pump through condensate drainpipe to the ground.

All units shall be as specified in the bills of quantities

5.2 Outdoor Unit

The unit shall comprise of several modules(compressors and inverters) interconnected together and shall be running sequentially depending on the cooling load demands from the conditioned space. The modules and their arrangement shall be as specified in the bills of quantities and shall be sized to match the indoor units.

The outdoor units shall have the following parameters: -

Sound level (limit) - 49 dB(A) at 1 meter

The modules shall be complete with integral isolator, compressors, condenser fans, LP/HP cut-outs, auto restart after power failure and weather proof.

5.7 **Components**

a) **Compressors**

These shall be rotary with three-phase motors having internal current/thermal overload device and pressure relief valve.

b) Condenser

These shall be forced-draught type with acrylic-dipped copper tubes mechanically expanded into aluminum fins spaced at approximately. 10 per 25mm.

c) **Fans**

These shall be of the forward curved centrifugal type and shall be made of aluminum, reinforced fibre or rigid plastic material.. The fan shall have variable speeds to enable the user to reduce both air volume and noise levels.

d) Operating Controls

These shall comprise an ON/Off switch, combined with fan speed controller and a compressor selector to give a range of options such as: off; fan only; fan & low cool, fan 7 high cool.

There shall be a bimetallic, single-pole single-throw (SPST) thermostat with sensing phial clipped in the return air stream behind the air filter. This shall cycle the compressor but the evaporator fan shall be unaffected as long as the unit is switched "ON".

e) Safety Controls

These shall comprise either externally or internally mounted compressor motor overloads, to safeguard against thermal or electrical overloads.

f) Central Remote Controller.

The controller shall be connected to the outdoor unit. The remote shall control the entire indoor units installed and shall be connected to the outdoor unit.

g) Noise Level

Fan and motor assemblies shall be complete with anti-vibration mountings and shall operate quietly, with the noise level at 1 metre not exceeding noise curve NR 49dB(A).

h) **Refrigerant piping**

The refrigerant piping shall be neatly installed and clipped on the wall. The pipes shall also be neatly boxed or put in a trunking to the approval of the engineer.

i) Installation Requirements

Suitable aperture and supporting frame to be fitted in a wall shall be made. The unit shall be properly balanced and supported in a manner that prevents noise or "drumming" regardless of the type of structure in which it is supported.

j) Mounting Brackets

The air-conditioners shall be held in position by two mounting brackets, fixed to the wall. The sub-contractor shall ensure that any damage to the wall is made good-inside and out around the frame, and repaint as necessary. The sub-contractor shall ensure that the unit is perfectly level from side to side and that from to back it is sloping slightly to the rear of the baseplate.

k) Power Supply

The power point serving the system shall be as close as possible to the modules and slightly lower to the side on which the power cable enters the front of the chassis and of the fused switch type.

With the indoor air filters in place, the power supply shall be switched on to start the unit working steadily through the full operating sequence permitted by the controls. The sub-contractor shall ensure that the control switch operates in every position which can be selected.

l) Testing and Commissioning

The sub-contractor shall test and commission the unit to the entire satisfaction of the Engineer and the Employer. In particular he shall check the full load amperage drawn using a clip-on ammeter to confirm that this does not exceed values shown on the nameplate. The sub-contractor shall adjust the supply air grille to produce effective distribution throughout the room, free from draughts and pockets of stagnant air. Control

knobs shall be checked and confirmed to be tight. The differential between the temperatures of the air entering the return grille and that leaving the discharge grille shall be ascertained to be what the manufacturer recommends.

The sub-contractor shall produce operation and maintenance manuals to be given to the Engineer for onward transmission to the Employer.

m) **Maintenance Contract**

The contractor shall provide all necessary technical brochures and operation manuals to the Client upon completion of works. He shall also quote for maintenance of these units after the 6 months liability period is over.

The scope of maintenance works shall include but not be restricted to all normal servicing of he unit which shall be carried out as stipulated in the maintenance contract agreement to be entered between the Client and the Sub-contractor.

SECTION VI:

DRAWINGS

JOB No. 1801

PROJECT: PROPOSED ADMINISTRATION BLOCK FOR JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

DRAWING No.	DRAWING TITLE	DATE	REVISIONS A	B	C	D	E	F	G	H
M1801–01	FOURTH FLOOR PLAN PLUMBING & FIRE FIGHTING LAYOUT	8.03.18	✓							
M1801–02	THIRD FLOOR PLAN PLUMBING & FIRE FIGHTING LAYOUT	2.05.18 10.7.18		✓	✓					
M1801–03	SECOND FLOOR PLAN PLUMBING & FIRE FIGHTING LAYOUT									
M1801–04	FIRST FLOOR PLAN PLUMBING & FIRE FIGHTING LAYOUT									
M1801–05	GROUND FLOOR PLAN PLUMBING & FIRE FIGHTING LAYOUT									
M1801–06	BASEMENT FLOOR PLAN PLUMBING & FIRE FIGHTING LAYOUT									
M1801–07	ROOF PLAN SOLAR WATER HEATING LAYOUT									
M1801–08	FOURTH FLOOR PLAN PLUMBING (HWS) LAYOUT									
M1801–09	THIRD FLOOR PLAN PLUMBING (HWS) LAYOUT									
M1801–10	SECOND FLOOR PLAN PLUMBING (HWS) LAYOUT									
M1801–11	FIRST FLOOR PLAN PLUMBING (HWS) LAYOUT									
M1801–12	GROUND FLOOR PLAN PLUMBING (HWS) LAYOUT									

REVISIONS				
DATE				

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1503

PROJECT: PROPOSED ADMINISTRATION BLOCK FOR JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

DRAWING TITLE:
DRAWING LIST – MECHANICAL INSTALLATIONS.

DES/DRN.	APPROVED.	DATE.	SCALE.	JOB No.	DRG No.	REV.
V.M/S.L	Eng.N.G	JULY.2018	N.T.S	1801	M1801–00	C

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JOB No. 1801

PROJECT: PROPOSED ADMINISTRATION BLOCK FOR JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

DRAWING No.	DRAWING TITLE	DATE	REVISIONS A	B	C	D	E	F	G	H
M1801–13	FOURTH FLOOR PLAN DRAINAGE LAYOUT	5.03.18	✓							
M1801–14	THIRD FLOOR PLAN DRAINAGE LAYOUT	2.05.18 10.7.18		✓	✓					
M1801–15	SECOND FLOOR PLAN DRAINAGE LAYOUT									
M1801–16	FIRST FLOOR PLAN DRAINAGE LAYOUT									
M1801–17	GROUND FLOOR PLAN DRAINAGE LAYOUT									
M1801–18	BASEMENT FLOOR PLAN DRAINAGE LAYOUT									
M1801–19	ROOF PLAN RAIN WATER DOWNPIPES LAYOUT									
M1801–20	FOURTH FLOOR PLAN RAIN WATER DOWNPIPES LAYOUT									
M1801–21	THIRD FLOOR PLAN RAIN WATER DOWNPIPES LAYOUT									
M1801–22	SECOND FLOOR PLAN RAIN WATER DOWNPIPES LAYOUT									
M1801–23	FIRST FLOOR PLAN RAIN WATER DOWNPIPES LAYOUT									
M1801–24	GROUND FLOOR PLAN RAIN WATER DOWNPIPES LAYOUT									
M1801–25	BASEMENT FLOOR PLAN RAIN WATER DOWNPIPES LAYOUT									

REVISIONS				
DATE				

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PROJECT: PROPOSED ADMINISTRATION BLOCK FOR JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

DRAWING TITLE:

DRAWING LIST – MECHANICAL INSTALLATIONS.

DES/DRN.	APPROVED.	DATE.	SCALE.	JOB No.	DRG No.	REV.
V.M/S.L	Eng.N.G	JULY.2018	N.T.S	1801	M1801–00	C

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JOB No. 1801

PROJECT: PROPOSED ADMINISTRATION BLOCK FOR JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

DRAWING No.	DRAWING TITLE	DATE	REVISIONS A	B	C	D	E	F	G	H
M1801–26	ROOF PLAN AIR CONDITIONING & MECHANICAL VENTILATION EQUIPMENT LAYOUT	8.03.18 2.05.18 10.7.18	✓	✓	✓					
M1801–27	FOURTH FLOOR PLAN AIR CONDITIONING & MECHANICAL VENTILATION LAYOUT									
M1801–28	THIRD FLOOR PLAN AIR CONDITIONING & MECHANICAL VENTILATION LAYOUT									
M1801–29	SECOND FLOOR PLAN AIR CONDITIONING & MECHANICAL VENTILATION LAYOUT									
M1801–30	FIRST FLOOR PLAN AIR CONDITIONING & MECHANICAL VENTILATION LAYOUT									
M1801–31	GROUND FLOOR PLAN AIR CONDITIONING & MECHANICAL VENTILATION LAYOUT									
M1801–32	PETROL INTERCEPTOR DETAILS LAYOUT									
M1801–33	SERVER ROOM FIRE SUPRESSION LAYOUT									
M1801–34	GATE HOUSE PLUMBING AND DRAINAGE LAYOUT									

REVISIONS				
DATE				

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PROJECT: PROPOSED ADMINISTRATION BLOCK FOR JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

DRAWING TITLE:

DRAWING LIST – MECHANICAL INSTALLATIONS.

DES/DRN.	APPROVED.	DATE.	SCALE.	JOB No.	DRG No.	REV.
V.M/S.L	Eng.N.G	JULY.2018	N.T.S	1801	M1801–00	C

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SECTION VII:

BILLS OF QUANTITIES

Notes for preparing Bills of Quantities

1.0 **Preamble To Bill of Quantities**

a) The Bill of Quantities shall form part of the Contract Documents and is to be read in conjunction with the Instructions to Tenderers, Conditions of Contract Parts I and II, Specifications and Drawings.

b) The brief description of the items in the Bill of Quantities is purely for the purpose of identification, and in no way modifies or supersedes the detailed descriptions given in the conditions of Contract and Specifications for the full direction and description of work and materials.

c) The Quantities set forth in the Bill of Quantities are estimated and provisional, representing substantially the work to be carried out, and are given to provide a common basis for tendering and comparing of Tenders. There is no guarantee to the Contractor that he will be required to carry out all the quantities of work indicated under any one particular item or group of items in the Bill of Quantities. The basis of payment shall be the Contractor's rates and the quantities of work actually done in fulfilment of his obligation under the Contract.

d) The prices and rates inserted in the Bills of Quantities will be used for valuing work executed, and the Engineer will measure the whole of the works executed in accordance with this Contract.

e) A price or rate shall be entered in ink against every item in the Bill of Quantities with the exception of items, which already have provisional sums, affixed thereto. The Tenderers are reminded that no "nil" or "included" rates or "lump-sum" discounts will be accepted. The rates for various items should include discounts if any. Tenderers who fail to comply will be disqualified.

f) Provisional sums (including Dayworks) in the Bill of Quantities shall be expended in whole or in part at the discretion of the Engineer in accordance with Sub-clause 52.4 and Clause 58 of part of the Conditions of Contract.

g) The price and rates entered in the Bill of Quantities shall, except insofar as it is otherwise provided under the Contract, include all Constructional plant to be used, labour, insurance, supervision, compliance, testing, materials, erection, maintenance or works, overheads and profits, taxes and duties together with all general risks, liabilities and obligations set out or implied in the Contract, transport,
electricity and telephones, water, use and replenishment of all consumables, including those required under the Contract by the Engineer and his staff.

h) Errors will not be corrected by the Employer for any arithmetic errors in computation or summation

i) The Bills of Quantities, unless otherwise expressly stated therein, shall be deemed to have been prepared in accordance with the principles of the latest edition of the Civil Engineering Standard Method of Measurement (CESMM).

j) "Authorised" "Directed" or "Approved" shall mean the authority, direction or approval of the Engineer.

k) Unless otherwise stated, all measurements shall be net taken on the finished work carried out in accordance with the details shown on the drawings or instructed, with no allowance for extra cuts or fills, waste or additional thickness necessary to obtain the minimum finished thickness or dimensions required in this Contract. Any work performed in excess or the requirements of the plans and specifications will not be paid for, unless ordered in writing by the Engineer.

l) (a) Hard material, in this Contract, shall be defined as the material which, in the opinion of the Engineer, require blasting, or the use of metal wedges and sledgehammers, or the use of compressed air drilling for their removal, and which cannot be extracted by ripping with a dozer tractor of at least 150 brake horse power (112 kilowatt) with a single, rear-mounted, hydraulic ripper. Boulders of more than $0.2m^3$ occuring in soft material shall be classified as hard material
(b) Soft material shall be all material other than hard material.

2.0 The objectives of the Bills of Quantities are;

(a) to provide sufficient information on the quantities of Works to be performed to enable tenders to be prepared efficiently and accurately;

and

(b) when a Contract has been entered into, to provide a priced Bills of Quantities for use in the periodic valuation of Works executed.

In order to attain these objectives, Works should be itemized in the Bills of Quantities in sufficient detail to distinguish between the different classes of Works, or between Works of the same nature carried out in different locations or in other circumstances which may give rise to different considerations of cost. Consistent with these requirements, the layout and content of the Bills of Quantities should be as simple and brief as possible.

3.0 The Bills of Quantities should be divided generally into the following sections:

(a) Preliminaries.

The preliminaries should indicate the inclusiveness of the unit prices, and should state the methods of measurement which have been adopted in the preparation of the Bills of Quantities and which are to be used for the measurement of any part of the Works.

The number of preliminary items to be priced by the tenderer should be limited to tangible items such as site office and other temporary works, otherwise items such as security for the Works which are primarily part of the Contractor's obligations should be included in the Contractor's rates.

(b) Work Items

(i) The items in the Bills of Quantities should be grouped into sections to distinguish between those parts of the Works which by nature, location, access, timing or any other special characteristics may give rise to different methods of construction or phasing of the Works or considerations of cost. General items common to all parts of the Works may be grouped as a separate section in the Bills of Quantities.

(ii) The brief description of the items in the Bill of Quantities should in no way modify or supersede the detailed descriptions given in the Contract drawings, Conditions of Contract and Specifications.

(iii) Quantities should be computed net from the Drawings, unless directed otherwise in the Contract, and no
allowance should be made for bulking, shrinkage or waste. Quantities should be rounded up or down where appropriate.

(iv) The following units of measurement and abbreviations are recommended for use.

Unit	*Abbreviation*	*Unit*	*Abbreviation*
cubic meter	M^3 or cu m	millimeter	mm
hectare	ha	month	mon
hour	h	number	nr
kilogram	kg	square meter	m^2 or sq m
lump sum	sum	square millimeter	mm^2 or sq mm
meter	m	week	wk
metric ton (1,000 kg)	t		

(v) The commencing surface should be identified in the description of each item for Work involving excavation, boring or drilling, for which the commencing surface is not also the original surface. The excavated surface should be identified in the description of each item for Work involving excavation for which the excavated surface is not also the final surface. The depths of Work should be measured from the commencing surface to the excavated surface, as defined.

(c) Daywork Schedule

A Daywork Schedule should be included if the probability of unforeseen work, outside the items included in the Bills of Quantities is relatively high. To facilitate checking by the Employer of the realism of rates quoted by the tenderers, the Daywork Schedule should normally comprise:

(i) a list of the various classes of labour, and materials for which basic Daywork rates or prices are to be inserted by the tenderer, together with a statement of the conditions under which the Contractor will be paid for Work executed on a Daywork basis; and

(ii) a percentage to be entered by the tenderer against each basic Daywork Subtotal amount for labour, materials and plant representing the Contractor's profit, overheads, supervision and other charges.

(d) Provisional Quantities and Provisional Sums

(i) Provision for quantity contingencies in any particular tem or class of Work with a high expectation of quantity overrun should be made by entering specific "Provisional Quantities" or "Provisional Items" in the Bills of Quantities, and *not* by increasing the quantities for that item or class of Work beyond those of the Work normally expected to be required. To the extent not covered above, a general provision for physical contingencies (quantity overruns) should be made by including a "Provisional Sum" in the Summary of the Bills of Quantities. Similarly, a contingency allowance for possible price increases should be provided as a "Provisional Sum" in the Summary of the Bills of Quantities. The inclusion of such provisional sums often facilitates budgetary approval by avoiding the need to request periodic supplementary approvals as the future need arises.

(ii) Provisional Sums to cover specialized works normally carried out by Nominated Sub Contractors should be avoided and instead Bills of Quantities of the specialised Works should be included as a section of the main Bill of Quantities to be priced by the Main Contractor. The Main Contractor should be required to indicate the name (s) of the specialised firms he proposes to engage to carry out the specialized Works as his approved domestic sub-contractors. Only Provisional Sums to cover specialized Works by statutory authorities should be included in the Bills of Quantities.

(iii) Unless otherwise provided in the Contract, the Provisional Sums included in the Bills of Quantities should always be expended in whole or in part at the discretion of the Engineer after full consultation with the Employer.

(e) Summary

The Summary should contain a tabulation of the separate parts of the Bills of Quantities carried forward, with Provisional Sums for Dayworks, physical (quantity) contingencies, and price contingencies (upward price adjustment) where applicable.

JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
PROPOSED ADMINISTRATION BLOCK
BILLS OF QUANTITIES FOR AIR CONDITIONING AND MECHANICAL VENTILATION

BILL NO. 1: AIR-CONDITIONING INSTALLATIONS FOR SENATE AND CONFERENCE

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh Cts.)
	Supply, install, test and commission the following modular multi system Air-conditioning system comprising of modular indoor units, modular outdoor unit, single refrigerant piping circuit and other components as described below. Tenderers must allow in their rates prices for all the couplings, connectors, joints, bends, etc. in running lengths of refrigerant pipes and condensate pipes. Jointing & installation methods shall be as per manufacturers' recommendations only. **MODULAR MULTI SYSTEM** has been used as a guide to the type and quality expected. Tenderers may submit alternative systems based on single refrigerant piping circuit. However, these systems must be accompanied by Itemized Bills of Quantities and Manufacturer's catalogue to the approval of the Engineer. **Alternative quotations that do not meet this criterion will <u>NOT</u> be considered.** **Indoor Unit**				
1.01	**Concealed Duct High Static Pressure Type indoor air- conditioning unit with:** **. Cooling capacity : - 28kW** . Air flow rate (high):- 1163 l/s . External static pressure range 68-137-196 pascals (3 steps) . Condensate drain pipe (25mm diameter MUPVC) from indoor unit (Approximately 60m) . Fan motor . Limiting noise level 63dB (A) at high speed. . Cooling coil . 'Green' Refrigerant charge . Condensate drip pan Refrigerant piping insulated with 25mm thick Armaflex Insulation. . Support brackets etc. **Mandatory Options** . Renewal of indoor ambient air with constant fresh air supply through the field installed fresh air intake connection. . High efficiency filter on inlet side . Factory made sunction canvas . Drain pump kit . Flexible ducting to fit the supply side The unit to be as **Toshiba MMD-0964H-E**	2	No.		
	Total C/F to 56				

JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
PROPOSED ADMINISTRATION BLOCK
BILLS OF QUANTITIES FOR AIR CONDITIONING AND MECHANICAL VENTILATION

BILL NO. 1: AIR-CONDITIONING INSTALLATIONS FOR SENATE AND CONFERENCE

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh Cts.)
	Total B/F from 55				
1.02	**Concealed Duct High Static Pressure Type indoor air- conditioning unit with:** **. Cooling capacity : - 22.4kW** . Air flow rate (high):- 1000 l/s . External static pressure range 69-196 pascals . Condensate drain pipe (25mm diameter MUPVC) from indoor unit (Approximately 60m) . Fan motor . Limiting noise level 50.5dB (A) at high speed. . Cooling coil . 'Green' Refrigerant charge . Condensate drip pan Refrigerant piping insulated with 25mm thick Armaflex Insulation. . Support brackets etc. **Mandatory Options** . Renewal of indoor ambient air with constant fresh air supply through the field installed fresh air intake connection. . High efficiency filter on inlet side . Factory made sunction canvas . Drain pump kit . Flexible ducting to fit the supply side The unit to be as **Toshiba MMD-0724H-E**	2	No.		
	Total C/F to 57				

JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
PROPOSED ADMINISTRATION BLOCK
BILLS OF QUANTITIES FOR AIR CONDITIONING AND MECHANICAL VENTILATION

BILL NO. 1: AIR-CONDITIONING INSTALLATIONS FOR SENATE AND CONFERENCE

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh Cts.)
	Total B/F from 56				
	Modular Outdoor Unit				
1.03	**Modular (3 module) air cooled outdoor unit with a cooling capacity of 106.5 kW complete with:** **.Cooling only** .CFC-free refrigerant R410A . Local electrical isolator .Two inverter controlled DC twin totary compressors **. Energy Efficency Ratio of cooling (EER) of 3.47** . Even spreading of operating operating hours between compressors .Discharge and sunction temperature sensors . Internal overload relay .Compressor over- current relay . Over current sensor . High pressure switch . Low pressure sensor . Connecting port for refrigerant pipe comprising of 28.6mm diameter port for Gas side, 12.7mm diameter for liquid side and 9.5mm diameter for gas side. . Limiting noise level 65 dB . Condenser fan . Support bracket The unit to be as **Toshiba AP 3814HT8-E**	1	No.		
1.04	Allow for a sum for hoisting the outdoor unit described in Item 1.03 from ground level to fourth floor roof slab		Item		
1.05	Allow for Electrical wiring between the outdoor unit in manufacturers recommended cables to an isolator approximately 30 metres away descibed in the electrical section of this document		Item		
1.06	Supply, install test and commission central remote controller with: . Temperature setting function . Integrated setup function . Priority change function between central controller and local controller . Self diagnosis function . Timer function and any other necessary accessories as per manufacturer's recommendation	1	No.		
	Total C/F to 58				

JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
PROPOSED ADMINISTRATION BLOCK
BILLS OF QUANTITIES FOR AIR CONDITIONING AND MECHANICAL VENTILATION

BILL NO. 1: AIR-CONDITIONING INSTALLATIONS FOR SENATE AND CONFERENCE

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh Cts.)
	Total B/F from 57				
1.07	Allow for control wiring between room remote controller and **Central controller** in manufacturers recommended cables.	90	LM		
1.08	Supply, install, test and commission wired remote controller **Simplified Remote Controller** complete with: . Control wiring with connection to indoor unit . Temperature setting function . Self diagnosis function and any other necessary accessories as per manufacturer's recommendation.	2	No.		
1.09	Ditto but group controller capable of controlling FOUR units in one room simulteanously	1	No.		
1.10	Allow for control wiring between room remote controller and indoor unit in manufacturers recommended cables (approximately 30 LM)	3	No.		
1.11	Allow for Electrical wiring between the indoor unit in manufacturers recommended cables to a D.P switch descibed in the electrical section of this document within the room(approximately 30 LM)	4	No.		
	Tenderers to note that the joints and pipework described below are provisional and based on description by a random equipment supplier. Each Tenderer will be expected to confirm similar fittings as per recommendation by the manufacturer.				
1.12	Y- Shape branching joint model	4	No.		
1.13	4 branching header joint	2	No.		
1.14	T Shape branching joint for connection of outdoor units	4	No.		
	Supply and install refrigerant piping (vapor and liquid lines) both insulated with 25mm thick Armaflex insulation. Rate to allow for connection between modular indoor units (4 No.) as described elsewhere and modular outdoor unit as per manufacturer's recommendation				
1.15	**Pipes (Provisional)**				
	a) 6mm diameter copper tube	35	LM		
	b) 9mm ditto	45	LM		
	c) 12mm ditto	32	LM		
	d) 20mm ditto	45	LM		
	e) 28mm ditto	32	LM		
	f) 40mm ditto	26	LM		
	Total C/F to Summary Page				

JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
PROPOSED ADMINISTRATION BLOCK
BILLS OF QUANTITIES FOR AIR CONDITIONING AND MECHANICAL VENTILATION

BILL NO. 2: AIR-CONDITIONING INSTALLATIONS FOR VC WING

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh Cts.)
	Supply, install, test and commission the following modular multi system Air-conditioning system comprising of modular indoor units, modular outdoor unit, single refrigerant piping circuit and other components as described below. Tenderers must allow in their rates prices for all the couplings, connectors, joints, bends, etc. in running lengths of refrigerant pipes and condensate pipes. Jointing & installation methods shall be as per manufacturers' recommendations only. **TOSHIBA MODULAR MULTI SYSTEM** has been used as a guide to the type and quality expected. Tenderers may submit alternative systems based on single refrigerant piping circuit. However, these systems must be accompanied by Itemized Bills of Quantities and Manufacturer's catalogue to the approval of the Engineer. **Alternative quotations that do not meet this criterion will <u>NOT</u> be considered.** **Indoor Unit**				
2.01	**Modular Ceiling Cassette air- conditioning unit with:** **. Cooling capacity : - 7.1kW (24,000 Btu/Hr)** . Air flow rate (high):- 333l/s . Fan speed: - 3 steps . Condensate drain pipe (25mm diameter MUPVC) from indoor unit (Approximately 60m) . Fan motor . Limiting noise level 34dB (A) at high speed. . Cooling coil . 'Green' Refrigerant charge . Condensate drip pan . Connecting pipe (15.9 mm diameter for Gas side, 9.5mm diameter for liquid side and 25mm diameter tube for the condensate Refrigerant piping insulated with 25mm thick Armaflex Insulation. . Support brackets etc.	3	No.		
	Total C/F to 60				

JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
PROPOSED ADMINISTRATION BLOCK
BILLS OF QUANTITIES FOR AIR CONDITIONING AND MECHANICAL VENTILATION

BILL NO. 2: AIR-CONDITIONING INSTALLATIONS FOR VC WING

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh Cts.)
	Total B/F from 59				
	Indoor Unit				
2.02	**Modular Ceiling Cassette air- conditioning unit with:** **. Cooling capacity : - 5.6 kW (18,000 Btu/Hr)** . Air flow rate (high):- 250 l/s . Fan speed: - 3 steps . Condensate drain pipe (25mm diameter MUPVC) from indoor unit (Approximately 60m) . Fan motor . Limiting noise level 34dB (A) at high speed. . Cooling coil . 'Green' Refrigerant charge . Condensate drip pan . Connecting pipe (15.9 mm diameter for Gas side, 9.5mm diameter for liquid side and 25mm diameter tube for the condensate Refrigerant piping insulated with 25mm thick Armaflex Insulation. . Support brackets etc.	10	No.		
	Total C/F to 61				

JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
PROPOSED ADMINISTRATION BLOCK
BILLS OF QUANTITIES FOR AIR CONDITIONING AND MECHANICAL VENTILATION

BILL NO. 2: AIR-CONDITIONING INSTALLATIONS FOR VC WING

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh Cts.)
	Total B/F from 60				
	Modular Outdoor Unit				
2.03	**Modular (2 module) air cooled outdoor unit with a cooling capacity of 78.5 kW complete with:** **.Cooling only** .CFC-free refrigerant R410A . Local electrical isolator .Two inverter controlled DC twin totary compressors **. Energy Efficency Ratio of cooling (EER) of 3.38** . Even spreading of operating operating hours between compressors .Discharge and sunction temperature sensors . Internal overload relay .Compressor over- current relay . Over current sensor . High pressure switch . Low pressure sensor . Connecting port for refrigerant pipe comprising of 28.6mm diameter port for Gas side, 12.7mm diameter for liquid side and 9.5mm diameter for gas side. . Limiting noise level 65 dB . Condenser fan . Support bracket The unit to be as **Toshiba AP 2814HT8-E**	1	No.		
2.04	Allow for a sum for hoisting the outdoor unit described in Item 2.03 from ground level to fourth floor roof slab		Item		
2.05	Allow for Electrical wiring between the outdoor unit in manufacturers recommended cables to an isolator approximately 30 metres away descibed in the electrical section of this document		Item		
2.06	Supply, install test and commission central remote controller with: . Temperature setting function . Integrated setup function . Priority change function between central controller and local controller . Self diagnosis function . Timer function and any other necessary accessories as per manufacturer's recommendation	1	No.		
	Total C/F to 62				

JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
PROPOSED ADMINISTRATION BLOCK
BILLS OF QUANTITIES FOR AIR CONDITIONING AND MECHANICAL VENTILATION

BILL NO. 2: AIR-CONDITIONING INSTALLATIONS FOR VC WING

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh Cts.)
	Total B/F from 61				
2.07	Allow for control wiring between room remote controller and **Central controller** in manufacturers recommended cables.	90	LM		
2.08	Supply, install, test and commission wired remote controller **Simplified Remote Controller** complete with: . Control wiring with connection to indoor unit . Temperature setting function . Self diagnosis function and any other necessary accessories as per manufacturer's recommendation.	6	No.		
2.09	Ditto but group controller capable of controlling THREE units in one room simulteanously	3	No.		
2.10	Allow for control wiring between room remote controller and indoor unit in manufacturers recommended cables (approximately 30 LM)	9	No.		
2.11	Allow for Electrical wiring between the indoor unit in manufacturers recommended cables to a D.P switch descibed in the electrical section of this document within the room(approximately 30 LM)	13	No.		
	Tenderers to note that the joints and pipework described below are provisional and based on description by a random equipment supplier. Each Tenderer will be expected to confirm similar fittings as per recommendation by the manufacturer.				
2.12	Y- Shape branching joint model	12	No.		
2.13	4 branching header joint	10	No.		
2.14	T Shape branching joint for connection of outdoor units	4	No.		
	Supply and install refrigerant piping (vapor and liquid lines) both insulated with 25mm thick Armaflex insulation. Rate to allow for connection between modular indoor units (13 No.) as described elsewhere and modular outdoor unit as per manufacturer's recommendation				
2.15	**Pipes (Provisional)**				
	a) 6mm diameter copper tube	120	LM		
	b) 9mm ditto	96	LM		
	c) 12mm ditto	82	LM		
	d) 20mm ditto	85	LM		
	e) 28mm ditto	64	LM		
	f) 40mm ditto	48	LM		
	Total C/F to Summary Page				

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PROPOSED ADMINISTRATION BLOCK
BILLS OF QUANTITIES FOR AIR CONDITIONING AND MECHANICAL VENTILATION

BILL NO. 3: AIR-CONDITIONING INSTALLATIONS FOR CONFERENCE WING

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh Cts.)
	Supply, install, test and commission the following modular multi system Air-conditioning system comprising of modular indoor units, modular outdoor unit, single refrigerant piping circuit and other components as described below. Tenderers must allow in their rates prices for all the couplings, connectors, joints, bends, etc. in running lengths of refrigerant pipes and condensate pipes. Jointing & installation methods shall be as per manufacturers' recommendations only. **TOSHIBA MODULAR MULTI SYSTEM** has been used as a guide to the type and quality expected. Tenderers may submit alternative systems based on single refrigerant piping circuit. However, these systems must be accompanied by Itemized Bills of Quantities and Manufacturer's catalogue to the approval of the Engineer. **Alternative quotations that do not meet this criterion will <u>NOT</u> be considered.** **Indoor Unit**				
3.01	**Modular Ceiling Cassette air- conditioning unit with:** **. Cooling capacity : - 7.1kW (24,000 Btu/Hr)** . Air flow rate (high):- 333l/s . Fan speed: - 3 steps . Condensate drain pipe (25mm diameter MUPVC) from indoor unit (Approximately 60m) . Fan motor . Limiting noise level 34dB (A) at high speed. . Cooling coil . 'Green' Refrigerant charge . Condensate drip pan . Connecting pipe (15.9 mm diameter for Gas side, 9.5mm diameter for liquid side and 25mm diameter tube for the condensate Refrigerant piping insulated with 25mm thick Armaflex Insulation. . Support brackets etc.	6	No.		
	Total C/F to 64				

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PROPOSED ADMINISTRATION BLOCK
BILLS OF QUANTITIES FOR AIR CONDITIONING AND MECHANICAL VENTILATION

BILL NO. 3: AIR-CONDITIONING INSTALLATIONS FOR CONFERENCE WING

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh Cts.)
	Total B/F from 63				
	Indoor Unit				
3.02	**Modular Ceiling Cassette air- conditioning unit with:** **. Cooling capacity : - 5.6 kW (18,000 Btu/Hr)** . Air flow rate (high):- 250 l/s . Fan speed: - 3 steps . Condensate drain pipe (25mm diameter MUPVC) from indoor unit (Approximately 60m) . Fan motor . Limiting noise level 34dB (A) at high speed. . Cooling coil . 'Green' Refrigerant charge . Condensate drip pan . Connecting pipe (15.9 mm diameter for Gas side, 9.5mm diameter for liquid side and 25mm diameter tube for the condensate Refrigerant piping insulated with 25mm thick Armaflex Insulation. . Support brackets etc.	2	No.		
	Total C/F to 65				

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BILL NO. 3: AIR-CONDITIONING INSTALLATIONS FOR CONFERENCE WING

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh Cts.)
	Total B/F from 64				
3.03	**Modular Outdoor Unit** **Modular (2 module) air cooled outdoor unit with a cooling capacity of 56 kW complete with:** **.Cooling only** .CFC-free refrigerant R410A . Local electrical isolator .Two inverter controlled DC twin totary compressors **. Energy Efficency Ratio of cooling (EER) of 3.78** . Even spreading of operating operating hours between compressors .Discharge and sunction temperature sensors . Internal overload relay .Compressor over- current relay . Over current sensor . High pressure switch . Low pressure sensor . Connecting port for refrigerant pipe comprising of 28.6mm diameter port for Gas side, 12.7mm diameter for liquid side and 9.5mm diameter for gas side. . Limiting noise level 65 dB . Condenser fan . Support bracket The unit to be as **Toshiba AP 2014HT8-E**	1	No.		
3.04	Allow for a sum for hoisting the outdoor unit described in Item 3.03 from ground level to fourth floor roof slab		Item		
3.05	Allow for Electrical wiring between the outdoor unit in manufacturers recommended cables to an isolator approximately 30 metres away descibed in the electrical section of this document		Item		
3.06	Supply, install test and commission central remote controller with: . Temperature setting function . Integrated setup function . Priority change function between central controller and local controller . Self diagnosis function . Timer function and any other necessary accessories as per manufacturer's recommendation	1	No.		
	Total C/F to 66				

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BILL NO. 3: AIR-CONDITIONING INSTALLATIONS FOR CONFERENCE WING

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh Cts.)
	Total B/F from Page 65				
3.07	Allow for control wiring between room remote controller and **Central controller** in manufacturers recommended cables.	90	LM		
3.08	Supply, install, test and commission wired remote controller Group **Remote Controller** capable of controlling TWO indoor units simultaneously complete with: . Control wiring with connection to indoor unit . Temperature setting function . Self diagnosis function and any other necessary accessories as per manufacturer's recommendation.	4	No.		
3.09	Allow for control wiring between room remote controller and indoor unit in manufacturers recommended cables (approximately 30 LM)	4	No.		
3.10	Allow for Electrical wiring between the indoor unit in manufacturers recommended cables to a D.P switch descibed in the electrical section of this document within the room(approximately 30 LM)	8	No.		
	Tenderers to note that the joints and pipework described below are provisional and based on description by a random equipment supplier. Each Tenderer will be expected to confirm similar fittings as per recommendation by the manufacturer.				
3.11	Y- Shape branching joint model	8	No.		
3.12	4 branching header joint	6	No.		
3.13	T Shape branching joint for connection of outdoor units	4	No.		
	Supply and install refrigerant piping (vapor and liquid lines) both insulated with 25mm thick Armaflex insulation. Rate to allow for connection between modular indoor units (8 No.) as described elsewhere and modular outdoor unit as per manufacturer's recommendation				
3.14	**Pipes (Provisional)**				
	a) 6mm diameter copper tube	82	LM		
	b) 9mm ditto	42	LM		
	c) 12mm ditto	62	LM		
	d) 20mm ditto	54	LM		
	e) 28mm ditto	46	LM		
	f) 40mm ditto	42	LM		
	Total C/F to Summary Page				

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BILL NO. 4: SPLIT TYPE AIR-CONDITIONING INSTALLATIONS FOR SERVER ROOM

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh Cts.)
	Indoor Unit				
4.01	Split type direct expansion High wall air conditioning unit with: - . Cooling capacity : - 24**,000 Btu/hr** . Fan speed: - 3 steps . Condensate drain pipe (25mm diameter MUPVC) from indoor unit (Approximately 20m) . LCD wireless remote controller . Fan motor . Limiting noise level 50 dB (A) at high speed. . Cooling coil . Refrigerant charge **(R410A)** . Condensate drip pan . Refrigerant piping (Vapour and liquid lines) both insulated with 25mm thick Armaflex Insulation (Approx. 25 m). . Support brackets etc. Unit to be as **CARRIER** or an approved equivalent	2	No.		
	Outdoor Unit				
4.02	Wall mounted air cooled unit complete with: . Local electrical isolator . Hermatically sealed rotary type compressor . Condensate fan . Support bracket . Burglar proofing grille with pad lock. **The unit must have an automatic restart system after power interruption.**	2	No.		
4.03	Allow for electrical and control wiring including cabling to and from the indoor units to outdoor units (for item 4.01&4.02) in 3x4.0mm^2 SC-PVC-CU cables wired in diameter 25mm HG conduit **(Approximately 40 meters long).**	2	No.		
4.04	Single Phase 30VA voltage switch as **sollatek AVS 30** complete with wiring	2	No.		
	Air Curtain				
4.05	Supply and install Air-Curtain as '**Totaline Model AC04-5B3R '** of dimensions 1500 × 215 × 180mm with an air volume capacity of 2350 m^3 /h , maximum speed of of 11m/s and noise level of 58dB.	4	No.		
4.06	Supply and install Air-Curtain as '**Totaline Model AC04-4B3R '** of dimensions 1200 × 215 × 180mm with an air volume capacity of 1930 m^3 /h , maximum speed of of 11m/s and noise level of 57dB.	2	No.		
4.07	Dehumidifier to be as **DANFOSS or an approved equivalent which must be of the same quality or HIGHER.**	2	No.		
	Total C/F to Summary Page				

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BILLS OF QUANTITIES FOR AIR CONDITIONING AND MECHANICAL VENTILATION
BILL NO. 5: TOILET VENTILATION

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT KSh. Cts.
	Toilet Extract Fans				
5.01	**"SYSTEMAIR AXIAL"** Extract fan as . The fan to have a capacity of 1.8 m^3/s against static pressure of 300Pa at a speed of 1449rpm. The fan is to be complete with flexible connection of approved material, anti-vibration mountings, external grill and speed regulator.	10	No.		
5.02	Fan silencer code	10	No.		
5.03	Allow for electrical and control wiring between the fan and an d.p swith provided by others 10 metres away. Also allow for connnection to Fire alarm panel done by others.	10	No.		
	DUCTWORK **Supply and install the following ductwork in galvanized mild steel sheets with 1.2mm thickness. Rates to allow for duct support hanger jointing and all other necessary accessories.**				
5.04	**STRAIGHT LENGTHS**				
	400x300mm straight lengths	90	LM		
	500x300mm ditto	70	LM		
	300x300mm ditto	90	LM		
	250x250 ditto	120	LM		
	800x400 ditto	25	LM		
5.05	**BENDS**				
	500x300mm 90^0 bend	10	No.		
	400x300mm ditto	8	No.		
	300x300mm ditto	30	No.		
	300x250mm ditto	8	No.		
	250x250mm ditto	16	No.		
	800x400 ditto	2	LM		
5.06	**TEE BRANCH**				
	500mm by 300mm Tee Branch	12	No.		
	400x300mm ditto	20	No.		
	300x300mm ditto	20	No.		
	250x250mm ditto	20	No.		
5.07	**TRANSITION PIECES**				
	500x300mm to 400x300mm	6	No.		
	400x300mm to 300x300mm	6	No.		
5.08	Allow for Flexible ducts for connection of extract and supply diffusers/ grills **(Provisional)**	120	No.		
5.09	600 x600 mm Ceiling mounted supply and extract difuser to engineer's approval.	54	No.		
5.10	200 x200 mm Ceiling mounted extract grill as "egg crate" or equal and approved	45	No.		
	Total C/F to Summary Page				

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BILLS OF QUANTITIES FOR AIR CONDITIONING AND MECHANICAL VENTILATION
BILL NO. 6: KITCHEN VENTILATION

ITEM No.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
6.01	Kitchen extraction hood constructed from anodized Aluminium gauge 18. The hood is to be L-shaped and measuring 5300 × 4100mm and a debth of 1000mm on stainless steel framework of angle sections, complete with drain channel. The hood is to be suspended firmly to the ceiling with 4 No. 5mm chains at the 4 corn	1	No.		
6.02	Allow for supply and installation of Kitchen hood extract plenum box (in anodized aluminium gauge 18) size 400x400x300mm high.	2	No.		
	Grease filter				
6.03	Single angle unit top exit grease filter complete with 2 No. washable panels. Filters to be as Vokes model TE 20/2 or equal and approved.	2	Set		
6.04	Mixed flow fan with a capacity of 1.0 m^3/s against static pressure of 400Pa at a speed of 480 rpm, with a motor rating of 0.78kW (1 phase). The fan is to be complete with antivibration mountings, speed regulator. The fan to be as **"Systemair"** or an approved equivalent.	2	No.		
6.05	The fan shall be connected to ductwork through a flexible connection of approved material.		Item		
6.06	Allow for electrical wiring including DOL starter to a power point approximately 35 metres away provided by others.	2	No.		
	Supply and install the following ductwork in galvanized mild steel sheets with 1.2mm thickness. Rates to allow for duct support hanger jointings and all other necessary accessories.				
6.07	400x400mm straight lengths	22	LM		
6.08	400x400mm 90^0 bend	8	No.		
6.09	Fan silencer to match the above fan	2	No.		
6.10	Fire damper of suitable dimensions to fit appropriately in the duct	2	No.		
	Total C/F to Summary Page				

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BILL NO. 7: GENERAL ITEMS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT KSH CTS.
	GENERAL ITEMS				
7.01	Allow for liaising and obtaining necessary licenses/permission and/or certificates from local authorities to complete works		Item		
7.02	Acquire and submit a Bank Guarantee for 10% of the sub-contract sum, as a Performance Guarantee.		Item		
7.03	Acquire and submit Insurance for the sub-contract work.		Item		
7.04	Allow for presentation of all the required samples as per specifications, Bills of Quantities and Drawings.		Item		
7.05	Prepare and submit Working Drawings comprising the following to the satisfaction of the Engineer both in hard and soft copy. All drawings to be in Autocad® 2000 format or an approved higher version: - i) Fully dimensioned drawings of all plants and apparatus. ii) General arrangement drawings of equipment, plant etc. iii) Routes – types and sizes and arrangement of all pipework. iv) Wiring and piping diagrams of plant and apparatus. v) Schematic diagram of individual plants and switch and control boards. vi) All the required operating instructions for all panels, boards, control panels etc. **(Note: Full set of drawings to be presented as per drawing list).**		Item		
	Total C/F to 71				

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BILLS OF QUANTITIES FOR AIR CONDITIONING AND MECHANICAL VENTILATION

BILL NO. 7: GENERAL ITEMS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT KSH. CTS.
	Total B/F from 70				
7.06	As item no. 7.05, but for Record (As-Installed) Drawings comprising: i) Fully dimensioned drawings of all plants and apparatus. ii) General arrangement drawings of equipment, plant etc. iii) Routes – types and sizes and arrangement of all pipework. iv) Wiring and piping diagrams of plant and apparatus. v) Schematic diagram of individual plants and switch and control boards. vi) All the required operating instructions for all panels, boards, control panels etc.				
7.07	Prepare and submit Maintenance Manuals for all items installed.		Item		
7.08	Provide a year's (12 months') initial maintenance upon expiry of the Defects Liability Period. The maintenance to be carried out every quarter (3 months) for a period of 12 months.		Quarter		
7.09	<u>All other items</u> of general preliminary to cover, but not limited to:- i. Attendance on all other sub-contractors, such as for Electrical Installations Plumbing & drainage Installations and Generator Installations etc. ii. Hiring and keeping a Supervisor/Foreman on site iii. Constant supervision of the works. iv. Provision of all the required spares. v. Testing and Inspection of materials/works. vi. Provision of labour camps. vii. Storage of materials. viii. Initial maintenance (During Defects Liability) ix. Providing water/electricity for the works. x. Protection of the works/materials xi. Clearing away on completion. xii. Preparing Final Account. xiii. Providing all Test Certificates, etc.		Item		
	Total C/F to Summary Page				

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PROPOSED ADMINISTRATION BLOCK

SUMMARY PAGE FOR AIR-CONDITIONING AND MECHANICAL VENTILATION INSTALLATIONS

ITEM NO.	DESCRIPTION	AMOUNT KSHS. CTS
1	Preliminaries related to Plumbing, Drainage and Firefighting Instalations	
2	Bill No. 1, B/F from 58	
3	Bill No. 2, B/F from 62	
4	Bill No. 3, B/F from 66	
5	Bill No. 4, B/F from 67	
6	Bill No. 5, B/F from 68	
7	Bill No. 6, B/F from 69	
8	Bill No. 7, B/F from 71	
9	Sub - Total	
10	Allow for 10% of Sub Total (Item 8 × 0.1) as Contigency	
	Total for Air-conditioning & Mechanical Ventilation C/F to Form of Tender	

Total Amount in words _____

_____

Tenderer's Name and Stamp _____
(as in form of tender)

Signature_____ **Date** _____

SECTION VIII

STANDARD FORMS

(i) Form of Invitation for Tenders
(ii) Form of Tender
(iii) Appendix to Form of Tender
(iv) Letter of Acceptance
(v) Form of Agreement
(vi) Form of Tender Security
(vii) Performance Bank Guarantee (unconditional)
(viii) Bank Guarantee for Advance Payment
(ix) Tender Questionnaire
(xi) Confidential Business Questionnaire
(x) Statement of Foreign Currency Requirement
(xi) Schedule of Materials;- Basic Prices
(xii) Schedule of Labour;- Basic Prices
(xiii) Schedule of Plant and Equipment
(xv) Details of Sub-Contractors
(xvi) Certificate of Tenderer's Site visit
(xvii) Form of Written Power of Attorney
(xviii) Key Personnel
(xix) Completed Civil Works
(xx) Schedule of Ongoing Projects
(xxi) Other Supplementary Information
(xxii) Request for Review Form

FORM OF INVITATION FOR TENDERS

_____*[date]*

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

Dear Sirs:

Reference: _____ [Contract Name]

You have been prequalified to tender for the above project.

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

A complete set of tender documents may be purchased by you from _____
_____ [mailing address, cable/telex/facsimile numbers].

Upon payment of a non-refundable fee of Kshs _____

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

_____
_____ [address and location]

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

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

Yours faithfully,

_____ ***Authorised Signature***
_____ ***Name and Title***

FORM OF TENDER

TO: _____*[Name of Employer)* _____*[Date]*

_____*[Name of Contract]*

Dear Sir,

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

2. We undertake, if our tender is accepted, to commence the Works as soon as is reasonably possible after the receipt of the Project Manager's notice to commence, and to complete the whole of the Works comprised in the Contract within the time stated in the Appendix to Conditions of Contract.

3. We agree to abide by this tender until _____*[Insert date]*, and it shall remain binding upon us and may be accepted at any time before that date.

4. Unless and until a formal Agreement is prepared and executed this tender together with your written acceptance thereof, shall constitute a binding Contract between us.

5. We understand that you are not bound to accept the lowest or any tender you may receive.

Dated this _____ day of _____20_____

Signature _____in the capacity of_____

duly authorized to sign tenders for and on behalf of _____*[Name of Employer]* of_____[*Address of Employer]*

Witness; Name_____

Address_____

Signature_____

Date_____

APPENDIX TO FORM OF TENDER

(This appendix forms part of the tender)

CONDITIONS OF CONTRACT	CLAUSE	AMOUNT
Tender Security (Bank Guarantee only)		Kshs
Amount of Performance Security (Unconditional Bank Guarantee)	10.1	___ percent of Tender Sum in the form of Unconditional Bank Guarantee
Program to be submitted	14.1	Not later than ___ days after issuance of Order to Commence
Cashflow estimate to be submitted	14.3	Not later than ___ days after issuance of Order to Commence
Minimum amount of Third Party Insurance	23.2	Kshs.
Period for commencement, from the Engineer's order to commence	41.1	_____ days
Time for completion	43.1	……
Amount of liquidated damages	47.1	Kshs. per day
Limit of liquidated damages	47.1	___% of Contract Value
Defect Liability period	49.1	Months
Percentage of Retention	60.5	___ of Interim Payment Certificate
Limit of Retention Money	60.5	___ % of Contract Price
Minimum amount of interim certificates	60.2	Contract value/Time for completion in months
Time within which payment to be made after Interim Payment Certificate signed by Engineer	60.8	_____days
Time within which payment to be made after Final Payment Certificate signed by Engineer	60.8	_____ days
Appointer of Arbitrator	67(3)	Chief Justice of The Republic of Kenya
Notice to Employer and Engineer	68.2	The Employers address is: Permanent Secretary, Ministry of……, P.O.Box …… NAIROBI The Engineer's address is: Chief Engineer(……), Ministry of……, P.O.Box…… NAIROBI

Signature of Tender……Date……

LETTER OF ACCEPTANCE

[letterhead paper of the Employer]

_____*[date]*

To: _____
[name of the Contractor]

_____
[address of the Contractor]

Dear Sir,

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

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

Authorized Signature ……

Name and Title of Signatory ……

Attachment : Agreement

FORM OF AGREEMENT

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

WHEREAS THE Employer is desirous that the Contractor executes
_____
(name and identification number of Contract) (hereinafter called "the Works") located at_____*[Place/location of the Works*]and the Employer has accepted the tender submitted by the Contractor for the execution and completion of such Works and the remedying of any defects therein for the Contract Price of Kshs_____[*Amount in figures*],Kenya Shillings_____[*Amount in words]*.

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.

2. The following documents shall be deemed to form and shall be read and construed as part of this Agreement i.e.

    (i) Letter of Acceptance

    (ii) Form of Tender

    (iii) Conditions of Contract Part I

    (iv) Conditions of Contract Part II and Appendix to Conditions of Contract

    (v) Specifications

    (vi) Drawings

    (vii) Priced Bills of Quantities

3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract.

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

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

The common Seal of _____

Was hereunto affixed in the presence of _____

Signed Sealed, and Delivered by the said _____

Binding Signature of Employer _____

Binding Signature of Contractor _____

In the presence of (i) Name_____

Address_____

Signature_____

[ii] Name _____

Address_____

Signature_____

FORM OF TENDER SECURITY

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

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

   We undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him, owing to the occurrence of one or both of the two conditions, specifying the occurred condition or conditions.

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

_____ _____
[date[*[signature of the Bank]*

_____ _____
[witness] *[seal]*

(Amend accordingly if provided by Insurance Company)

PERFORMANCE BANK GUARANTEE (UNCONDITIONAL)

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

Dear Sir,

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

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

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

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of Kshs. _____ (*amount of Guarantee in figures*) Kenya Shillings_____ (*amount of Guarantee in words*), and we undertake to pay you, upon your first written demand and without 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 thereunder or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this Guarantee, and we hereby waive notice of any change, addition, or modification.

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

SIGNATURE AND SEAL OF THE GUARANTOR _____

Name of Bank _____

Address _____

Date _____

(Amend accordingly if provided by Insurance Company)

BANK GUARANTEE FOR ADVANCE PAYMENT

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

Gentlemen,
Ref: _____*[name of Contract]*

In accordance with the provisions of the Conditions of Contract of the above-mentioned Contract, We,_____*[name and Address of Contractor]* (hereinafter called "the Contractor") shall deposit with _____*[name of Employer]* a bank guarantee to guarantee his proper and faithful performance under the said Contract in an amount of Kshs._____*[amount of Guarantee in figurers]* Kenya Shillings_____*[amount of Guarantee in words]*.

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

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

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

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

Yours faithfully,

Signature and Seal _____

Name of the Bank or financial institution _____

Address _____

Date _____
Witness: Name: _____
Address: _____
Signature: _____
Date: _____

TENDER QUESTIONNAIRE

Please fill in block letters.

1. Full names of tenderer

   ……

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

   ……

3. Telephone number (s) of tenderer

   ……

4. Telex address of tenderer

   ……

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

   ……

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

   ……

   ……

_____
Signature of Tenderer

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

ANTI – CORRUPTION POLICY IN THE PROCUREMENT PROCESS

UNDERTAKING BY BIDDER ON ANTI – CORRUPTION POLICY / CODE OF CONDUCT AND COMPLIANCE PROGRAMME

The governments of Kenya is committed to fighting corruption in all its forms and in all its institutions to ensure that all the government earned revenues are utilized prudently and for the purpose intended with a view to promoting economic development as the country work towards actualizing Vision 2030.

Here at Jaramogi Oginga Odinga University of Science and Technology and also being one of the government entities mandated under the government to provide quality education and transforming lives, on behalf of the government, we are highly committed to fighting any form of corruption in our organization to ensure that all the monies that the government entrust with us, is optimally and prudently utilized for the benefits of all the people we serve.

The following is a requirement that every Bidder wishing to do business with JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY must comply with:

(1) Each bidder must submit a statement, as part of the tender documents, in the format given and which must be signed personally by the Chief Executive Officer or other appropriate senior corporate officer of the bidding company and, where relevant, of its subsidiary in Kenya. If a tender is submitted by a subsidiary, a statement to this effect will also be required of the parent company, signed by its Chief Executive Officer or other appropriate senior corporate officer.

(2) Bidders will also be required to submit similar No-bribery commitments from their subcontractors and consortium partners; the bidder may cover the subcontractors and consortium partners in its own statement, provided the bidder assumes full responsibility.

(3) a) Payment to agents and other third parties shall be limited to appropriate compensation for legitimate services.

b) Each bidder will make full disclosure in the tender documentation of the beneficiaries and amounts of all payments made, or intended to be made, to agents or other third parties (including political parties or electoral candidates) relating to the tender and, if successful, the implementation of the contract.

c) The successful bidder will also make full disclosure [quarterly or semi- annually] of all payments to agents and other third parties during the execution of the contract.

d) Within six months of the completion of the performance of the contract, the successful bidder will formally certify that no bribes or other illicit commissions have been paid. The final accounting shall include brief details of the goods and services provided that are sufficient to establish the legitimacy of the payments made.

e) Statements required according to subparagraphs (b) and (d) of this paragraph will have to be certified by the company's Chief Executive Officer, or other appropriate senior corporate officer.

(4) Tenders which do not conform to these requirements shall not be considered.

(5) If the successful bidder fails to comply with its No-bribery commitment, significant sanctions will apply. The sanctions may include all or any of the following:

a) Cancellation of the contract;

b) Liability for damages to the public authority and/or the unsuccessful competitors in the bidding possibly in the form of a lump sum representing a pre-set percentage of the contract value (liquidated).

(6) Bidders shall make available, as part of their tender, copies of their anti-Bribery Policy/Code of Conduct, if any, and of their-general or project - specific - Compliance Program.

(7) The Government of Kenya through Ethics and Anti-Corruption Commission has made special arrangements for adequate oversight of the procurement process and the execution of the contract. Those charged with the oversight responsibility will have full access if need be to all documentation submitted by Bidders for this contract, and to which in turn all Bidders and other parties involved or affected by the project shall have full access (provided, however, that no proprietary information concerning a bidder may be disclosed to another bidder or to the public).

1. MEMORANDUM (FORMAT)

(Clause 46 of Kenya Public Procurement and Asset Disposal Act 2015)

This company _____*(name of company)* has issued, for the purposes of this tender, a Compliance Program copy attached -which includes all reasonable steps necessary to assure that the No-bribery commitment given in this statement will be complied with by its managers and employees, as well as by all third parties working with this company on the public sector projects or contract including agents, consultants, consortium partners, subcontractors and suppliers')"

Authorized Signature:_____

Name and Title of Signatory: _____

Name of Bidder: _____

Address: _____

CONFIDENTIAL BUSINESS QUESTIONNAIRE

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

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

Part 1 – General

Business Name .....

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

Plot No..... Street/Road .....

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

Nature of Business.....

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

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

Name of your bankers.....

Branch.....

Part 2 (a) – Sole Proprietor

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

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

*Citizenship details .....

Part 2 (b) – Partnership

Give details of partners as follows:

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

1.....
2.....
3.....

Part 2(c) – Registered Company:

Private or public.....

State the nominal and issued capital of the Company-

Nominal Kshs……

Issued Kshs……

Give details of all directors as follows:

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

1.
……
2.
……
3.
……
4.
……

Part 2(d) – Interest in the Firm:

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

I certify that the information given above is correct.

…… …… ……
(Title) *(Signature)* *(Date)*

* Attach proof of citizenship

STATEMENT OF FOREIGN CURRENCY REQUIREMENTS

(See Clause 60[5] of the Conditions of Contract)

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

(Figures)…… (Words)……

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

Currency in which foreign exchange element is required:

……

Date: The …… Day of …… 20……

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

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

_____
(Signature of Tenderer)

SCHEDULE OF MATERIALS;-BASIC PRICES
(Ref: Clause 70 of Conditions of Contract)

MATERIAL	UNIT	ORIGIN AND PRICE			TRANSPORTATION COST FROM SOURCE OF ORIGIN	
		COUNTRY OF ORIGIN	SUPPLIER	PRICE	MODE	PRICE (KSHS)
Cement	Mg					
Lime	Mg					
Sand	Mg					
Aggregate	Mg					
Diesel	L					
Regular Petrol	L					
Super Petrol	L					
Kerosene	L					
Structural steel	Mg					
Gabion Mesh	M2					
Reinforcement Steel	Mg					
Explosives	Kg					
Oil and Lubricants	L					
Bitumen Emulsion A3	L					
Bitumen Emulsion A4	L					
Bitumen Emulsion K1	L					
Bitumen Emulsion K3	L					
Bitumen 80/100	Kg					
Bitumen MC 30	ML					
Bitumen MC 70	L					
Bitumen MC 3000	L					
Ammonium nitrate for blasting	Kg					

I certify that the above information is correct.

…… …… ……

(Title) *(Signature)* *(Date)*

The prices inserted above shall be those prevailing 30 days before the submission of Tenders and shall be quoted in Kenya Shillings using the exchange rates specified in the Appendix to Form of Tender.

Prices of imported materials to be quoted CIF Mombasa or Nairobi as appropriate depending on whether materials are imported by the tenderer directly or through a local agent.

Transportation costs for imported materials to be quoted from Mombasa or Nairobi as appropriate to _____(Contract Site) depending on whether materials are imported directly by the tenderer or through a local agent.

LETTER OF NOTIFICATION OF AWARD

Address of Procuring Entity

_____

_____

To:_____

_____

_____

_____

RE: Tender No._____

Tender Name_____

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

_____

_____

1. Please acknowledge receipt of this letter of notification signifying your acceptance.

2. The contract/contracts shall be signed by the parties within 30 days of the date of this letter but not earlier than 14 days from the date of the letter.

3. You may contact the officer(s) whose particulars appear below on the subject matter of this letter of notification of award.

   *(FULL PARTICULARS)*_____

   _____

SIGNED FOR ACCOUNTING OFFICER

ANTI – CORRUPTION POLICY IN THE PROCUREMENT PROCESS

UNDERTAKING BY BIDDER ON ANTI – CORRUPTION POLICY / CODE OF CONDUCT AND COMPLIANCE PROGRAMME

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(1) Each bidder must submit a statement, as part of the tender documents, in the format given and which must be signed personally by the Chief Executive Officer or other appropriate senior corporate officer of the bidding company and, where relevant, of its subsidiary in Kenya. If a tender is submitted by a subsidiary, a statement to this effect will also be required of the parent company, signed by its Chief Executive Officer or other appropriate senior corporate officer.

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(3) a) Payment to agents and other third parties shall be limited to appropriate compensation for legitimate services.

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c) The successful bidder will also make full disclosure [quarterly or semi- annually] of all payments to agents and other third parties during the execution of the contract.

d) Within six months of the completion of the performance of the contract, the successful bidder will formally certify that no bribes or other illicit commissions have been paid. The final accounting shall include brief details of the goods and services provided that are sufficient to establish the legitimacy of the payments made.

e) Statements required according to subparagraphs (b) and (d) of this paragraph will have to be certified by the company's Chief Executive Officer, or other appropriate senior corporate officer.

(4) Tenders which do not conform to these requirements shall not be considered.

(5) If the successful bidder fails to comply with its No-bribery commitment, significant sanctions will apply. The sanctions may include all or any of the following:

c) Cancellation of the contract;

d) Liability for damages to the public authority and/or the unsuccessful competitors in the bidding possibly in the form of a lump sum representing a pre-set percentage of the contract value (liquidated).

(6) Bidders shall make available, as part of their tender, copies of their anti-Bribery Policy/Code of Conduct, if any, and of their-general or project - specific - Compliance Program.

(7) The Government of Kenya through Ethics and Anti-Corruption Commission has made special arrangements for adequate oversight of the procurement process and the execution of the contract. Those charged with the oversight responsibility will have full access if need be to all documentation submitted by Bidders for this contract, and to which in turn all Bidders and other parties involved or affected by the project shall have full access (provided, however, that no proprietary information concerning a bidder may be disclosed to another bidder or to the public).

2. MEMORANDUM (FORMAT)

(Clause 46 of Kenya Public Procurement and Asset Disposal Act 2015)

This company _____*(name of company)* has issued, for the purposes of this tender, a Compliance Program copy attached -which includes all reasonable steps necessary to assure that the No-bribery commitment given in this statement will be complied with by its managers and employees, as well as by all third parties working with this company on the public sector projects or contract including agents, consultants, consortium partners, subcontractors and suppliers')"

Authorized Signature:_____

Name and Title of Signatory: _____

Name of Bidder: _____

Address: _____

NON-DEBARMENT STATEMENT

I/We/Messrs……

of .....Street/avenue, ...Building, P. O. Box……Code ...…, of ..... (Town),

.... (Nationality), Phone: ..... E-mail .....….

declare that I/We /Messrs

……

are not debarred from participating in public procurement by the Public Procurement Oversight Authority pursuant to section 115 of the Public Procurement and Disposal Act, 2005.

Dated this .....day of ..... 20.....

Authorized Signature.....Official Stamp .....

Name and Title of Signatory…….....

STATEMENT OF COMPLIANCE

a) I confirm compliance of all clauses of the General Conditions, General Specifications and Particular Specifications in this tender.

b) I confirm I have not made and will not make any payment to any person, who can be perceived as an inducement to win this tender.

Signed: ……for and on behalf of the Tenderer

Date: ……..

Official Rubber Stamp: ……

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

1. .
2. .
3. .
4. .
5. .
6. .
7. .
8. .
9. .
10 .

FORM RB 1

REPUBLIC OF KENYA

PUBLIC PROCUREMENT ADMINISTRATIVE REVIEW BOARD

APPLICATION NO…….OF…….….20……...

BETWEEN

……..APPLICANT

AND

……RESPONDENT *(Procuring Entity*)

Request for review of the decision of the…… (*Name of the Procuring Entity)* of ……dated the…day of …….20…….in the matter of Tender No……...…of ……..20…

REQUEST FOR REVIEW

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

1.

2.

etc.

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

1.

2.

etc

SIGNED …….(Applicant)

Dated on…….day of ……/…20…

FOR OFFICIAL USE ONLY

Lodged with the Secretary Public Procurement Administrative Review Board on …… day of ……....20….……

SIGNED
Board Secretary

EVALUATION CRITERIA

Technical Evaluation Form: The tenderer is expected to complete Part 1 and 3 of this form

Part A: General Information

Tenderer Name……..

Postal Address……...

Telephone (Office)……..Mobile……..

Physical Address……

Part B: Evaluation Stages

Stage 1: Mandatory Requirements

*Applicants **must** qualify in all the requirements below for them to proceed to the Evaluation Stage 2- Technical evaluation*

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

Stage 2: Technical Evaluation

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

Item	Description	Points Scored	Max Points	Total Points
1.	Key Personnel (Attach evidence)			
	a) Project Engineer qualification • Holder of Degree ---------- 5 marks • Holder of Diploma ---------- 3marks • Holder of Certificate --------- 0 marks		5	25
	b) Project Engineer's experience • Over ten (10) year relevant experience -- 5 marks • Five (5) to ten (10) years relevant experience --------- 4 marks • Under five (5) years relevant experience ---- 2 marks • No experience ---------- 0 marks		5	
	c) Works Inspector Qualification • Holder of Degree in electrical engineering ---------- 5 marks • Holder of Diploma in electrical engineering ---------- 3 marks • Holder of Certificate in relevant engineering ---------- 1 mark • No Qualification ---------- 0 marks		5	
	d) Works Inspector's Experience • Over 10 years' relevant experience---------- 5 marks • Five (5) to ten (10) years' relevant experience ---------- 3 marks • Under 5 years' relevant experience ---------- 1 marks • No experience ----------0 marks		5	
	e) Experience of Site Technicians with minimum of certificate qualification in relevant Engineering field • Over 10 years' relevant experience ---------- 5 marks • Five (5) to ten (10) relevant experience -------- 3marks • Under 5 years' relevant experience ------ 1mark • No relevant experience ---------- 0 marks		5	

Item	Description	Points Scored	Max Points	Total Points
2.	Contracts completed in the last five (5) years; a max of 5 No. projects (Attach evidence in form of completion certificates or letters from clients/consultants.) • Project of similar nature, complexity and magnitude of equal or higher value. ---------- 5 marks each • Project of similar nature and complexity but of lower magnitude than the one in consideration ------ 3 marks each • No completed project of similar nature ---- 0 marks		25	25
3	On-going projects (A max of 2 No. projects) (Attach evidence; Letters of Award/ Interim certificates/ Contracts) • Project of similar nature, complexity and magnitude ---------- 5 marks each • Project of similar nature, but of lower value than the one in consideration ---------- 2.5 marks each • No ongoing project of similar nature ---------- 0 marks		10	10
5.	Evidence of business physical address. (Offices/Workshops). Provide copies of ownership or lease agreement documents.		5	5
6.	Financial report Audited financial report (last three [3] years) - 2017-2019 • Average Annual Turnover equal or higher than to Kshs. 40.0 Million ---------- 15 Marks • Average Annual Turnover between Kshs. 20 Million and Kshs 39.9 Million ---------- 10 Marks • Average Annual Turnover between Kshs. 10 Million and Kshs 19.9 Million ---------- 5 Marks • Average Annual Turnover below Kshs 10 Million ---------- 0 Marks		15	15
7.	Evidence of financial resources (cash in hand, lines of credit, overdraft facility etc.) • Amount equivalent to or above 25% of submitted tender sum ---------- 20 Marks		20	20

Item	Description	Points Scored	Max Points	Total Points
	• Amount equivalent to 20% but below 25% of submitted tender sum ---------- 15 Marks • Amount equivalent to 15% but below 20% of submitted tender sum ---------- 10 Marks • Amount equivalent to 10% but below 15% of submitted tender sum ---------- 5 Marks • Amount below 10% of submitted tender sum -------- 0 Mark			
	TOTAL			100

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

Stage 3: Financial Evaluation

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

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

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

Stage 4: Due Diligence and Recommendation for Award

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

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

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

Particulars of performance security; 10% of Sub-Contract sum.