



KARATINA UNIVERSITY

PROPOSED LIBRARY

STRUCTURED CABLING, IP-PABX, CCTV AND ACCESS CONTROL INSTALLATION WORKS SUB- CONTRACT

BILL OF QUANTITIES

TENDER NUMBER: KarU/OT/005/2020-2021

Project Consultants:

JKUATES LTD

P.O. BOX 62000-00200

NAIROBI

OCTOBER 2020

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INVITATION TO TENDER

OPEN TENDERS AND SUPPLIERS REGISTRATION

Karatina University invites tenders from interested eligible bidders for the under listed works and registration of suppliers.

ITEM	TENDER NUMBER	DESCRIPTION	ELIGIBILITY	CLOSING/ OPENING DATE	CLOSING/ OPENING DATE AND TIME
OPEN TENDERS					
1.	KarU/OT/004/2020-2021	Supply, delivery, installation, testing and commissioning of stand by generator	Open	10 th November, 2020	12.00 Noon
2.	KarU/OT/005/2020-2021	Structured Cabling, IP-PABX, CCTV and Access control installation works	Open	10 th November, 2020	2.30 PM
3.	KarU/OT/006/2020-2021	Air Condition and Mechanical ventilation works	Open	11 th November, 2020	12.00 Noon
REGISTRATION OF SUPPLIERS FOR 2020-2022 FINANCIAL YEARS					
4.	Various categories for good, works and services	Registration of suppliers for financial years 2020-2022	Refer to the invitation to tenderers in the bid document	12 th November, 2020	12.00 Noon

Interested and eligible contractors/suppliers may view and download tender documents free of charge from the University's website: www.karu.ac.ke or the PPIP tender portal: www.tenders.go.ke Enquiries may be sent via email to procurement@karu.ac.ke

Completed tender documents should be deposited in the Tender Box placed at the Administration Block at Karatina University (Main Campus) on or before the closing date and time as indicated above. Late submission will not be accepted.

The tenders **MUST** be submitted in two (2) copies, one marked **'ORIGINAL'** and the other one marked **'COPY'**

Sealed tenders must be marked with the tender name and reference number and addressed to:

The Vice Chancellor, Karatina University
P.O Box 1957-10101, KARATINA

Tenders will be opened as scheduled above, opening will take place in the Conference Hall at the Main Campus, Kagochi, Karatina, in the presence of bidders or their representatives who wish to attend.

Further information is available at www.karu.ac.ke

NOTES, STANDARD FORMS AND PRELIMINARIES

SPECIAL NOTES

1. Tenders shall be submitted on the form of tender attached hereto and all blanks in this form and in the schedules attached to the specification shall be completed.
2. No alteration shall be made on the form of tender or in the specifications and schedules.
3. The tenderer (whether his tender is accepted or not) and all other recipients of the specification and documents shall treat the details of specification and the documents attached thereto as private and confidential.
4. The employer does not bind himself to accept the lowest or any tender and will not be responsible for or pay for expenses or losses which may be incurred by any tendered in the preparation of this tender.
5. It will be assumed that the tenderer will have visited the site, and to have taken into consideration any special difficulties and requirements not referred to herein but associated with the conditions of existing facilities, ground levels etc, as the case maybe, and to have made allowance for such in this tender
6. All items of additional information, issued to tenderers prior to the time for closing the bids, shall become a part of the Contract Documents and shall be included in the proposals.
7. The tenderer shall, where applicable, provide leaflets and catalogues giving technical and physical details of the fittings being offered by him as an integral part of his bid.
8. Unless otherwise specified in the particular specification, Tenderers shall assume that all fittings required will be import duty paid.
9. The Contractor is required to check the numbers of the pages of these Bills of Quantities against the contents stated on page (i) and should he find any missing, in duplicate or indistinct, he must inform the procuring entity at once and have the same rectified.
10. Should the Contractor be in doubt about the precise meaning of any item or figure, for any reason whatsoever, he shall inform the procuring entity in order that the correct meaning may be established before the date for submission of tenders.
11. No liability will be admitted or claim allowed in respect of errors in the Contractor's tender due to mistakes in the Bills of Quantities which should have been rectified in the manner described above.
12. The accurate ordering of materials is the sole responsibility of the contractor in accordance with the final drawings and the instructions from the Project Manager. No claim for any loss or expense will be entertained for orders for materials based upon Bills of Quantities.
13. The successful tenderer shall be required to enter in a sub- contract agreement with the main contractor under the terms of the KABCEC conditions of subcontract.

14. The copyright of these Bills of Quantities is vested in the Project Manager and no reproduction in part or in whole may be carried out without their express or written consent.

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 main contract program*.
3. We agree to abide by this tender until _____ [Insert date; **90 days** from date of tender opening], 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 Contractor]

of _____ [Address of Contractor]

Witness; Name _____

Address _____

Signature _____ Date _____

FORM OF TENDER SECURITY

WHEREAS _____ (hereinafter called “the Tenderer”) has submitted his tender dated _____ for the construction of _____ (name of Contract)

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

THE CONDITIONS of this obligation are:

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

Or
2. If the tenderer, having been notified of the acceptance of his tender by the Employer during the period of tender validity:
 - (a) fails or refuses to execute the form of Agreement in accordance with the Instructions to Tenderers, if required; or
 - (b) fails or refuses to furnish the Performance Security, in accordance with the Instructions to Tenderers;

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

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

[Date]

[Signature of the Bank]

[Witness]

[Seal]

FORM OF PERFORMANCE BOND

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 _____

QUALIFICATION INFORMATION

1. Individual Tenderers or Individual Members of Joint Ventures

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

Place of registration: _____

Principal place of business _____

Power of attorney of signatory of tender _____

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

Year	Volume	
	Currency	Value

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

Project name	Name of client and contact person	Type of work performed and year of completion	Value of contract (Kshs)

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

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

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

Position	Name	Years of experience (general)	Years of experience in proposed position

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

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

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- 1.8 Name, address and telephone, telex and facsimile numbers of banks that may provide reference if contacted by the Employer.
-
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- 1.9 Statement of compliance with the requirements of Clause 1.2 of the Instructions to Tenderers.
-
-

- 1.10 Litigation and arbitration history (attach affidavit)
-
-

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

2 Joint Ventures

- 2.4 The information listed in 1.1 – 1.10 above shall be provided for each partner of the joint venture.
- 2.5 The information required in 1.11 above shall be provided for the joint venture.
- 2.6 Attach the power of attorney of the signatory(ies) of the tender authorizing signature of the tender on behalf of the joint venture
- 2.7 Attach the Agreement among all partners of the joint venture (and which is legally binding on all partners), which shows that:
- a) all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms;
 - b) one of the partners will be nominated as being in charge, authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the joint venture; and
 - c) the execution of the entire Contract, including payment, shall be done exclusively with the partner in charge.

TENDER QUESTIONNAIRE

Please fill in block letters.

1. Full names of tenderer

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

Physical address _____

3. Telephone number (s) of tenderer

4. Fax number(s) of tenderer

5. E-mail address of tenderer

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

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

Signature of Tenderer

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

CONFIDENTIAL BUSINESS QUESTIONNAIRE

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

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

Part 1 – General

Business Name

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

Plot No..... Street/Road

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

Nature of Business.....

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

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

Name of your bankers.....

Branch.....

Part 2 (a) – Sole Proprietor

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

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

*Citizenship details

Part 2 (b) – Partnership

Give details of partners as follows:

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

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

ANTI-CORRUPTION DECLARATION FORM

Date

To (name and address of employer)

.....

.....

I/We, the applicant(s) i.e. (name and address)

.....

declare that I/we:

- a) Has/have not been debarred from participating in public procurement.
- b) Has/have not been involved in and will not be involved in corrupt and fraudulent practices regarding public procurement.

.....

.....

.....

Title

Signature

Date

(To be signed by authorized representative of contractor and officially stamped)

INSTRUCTIONS TO TENDERERS AND EVALUATION CRITERIA

1. General

- 1.1 The Employer as defined in the Appendix to Conditions of Contract invites tenders for Works Contract as described in the tender documents. The successful tenderer will be expected to complete the Works by the Intended Completion Date specified in the tender documents.
- 1.2 All tenderers shall provide the Qualification Information, a statement that the tenderer (including all members of a joint venture and subcontractors) is not associated, or has not been associated in the past, directly or indirectly, with the Consultant or any other entity that has prepared the design, specifications, and other documents for the project or being proposed as Project Manager for the Contract. A firm that has been engaged by the Employer to provide consulting services for the preparation or supervision of the Works, and any of its affiliates, shall not be eligible to tender.
- 1.3 In the event that pre-qualification of potential tenderers has been undertaken, only tenders from pre-qualified tenderers will be considered for award of Contract. These qualified tenderers should submit with their tenders any information updating their original pre-qualification applications or, alternatively, confirm in their tenders that the originally submitted pre-qualification information remains essentially correct as of the date of tender submission.
- 1.4 Where no pre-qualification of potential tenderers has been done, all tenderers shall include the following information and documents with their tenders, unless otherwise stated:
 - (a) copies of original documents defining the constitution or legal status, place of registration, and principal place of business; written power of attorney of the signatory of the tender to commit the tenderer,
 - (b) total monetary value of construction work performed for each of the last five years,
 - (c) experience in works of a similar nature and size for each of the last five years, and details of work under way or contractually committed; and names and addresses of clients who may be contacted for further information on these contracts,
 - (d) major items of construction equipment proposed to carry out the Contract and an undertaking that they will be available for the Contract,
 - (e) qualifications and experience of key site management and technical personnel proposed for the Contract and an undertaking that they shall be available for the Contract.
 - (f) reports on the financial standing of the tenderer, such as profit and loss statements and auditor's reports for the past five years;
 - (g) evidence of adequacy of working capital for this Contract (access to line(s) of credit and availability of other financial resources);
 - (h) authority to seek references from the tenderer's bankers;

- (i) information regarding any litigation, current or during the last five years, in which the tenderer is involved, the parties concerned and disputed amount; and
 - (j) proposals for subcontracting components of the Works amounting to more than 10 percent of the Contract Price.
- 1.5 Tenders submitted by a joint venture of two or more firms as partners shall comply with the following requirements, unless otherwise stated:
 - (a) the tender shall include all the information listed in clause 1.4 above for each joint venture partner;
 - (b) the tender shall be signed so as to be legally binding on all partners;
 - (c) all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms;
 - (d) one of the partners will be nominated as being in charge, authorised to incur liabilities, and receive instructions for and on behalf of all partners of the joint venture; and
 - (e) The execution of the entire Contract, including payment, shall be done exclusively with the partner in charge.
- 1.6 To qualify for award of the Contract, tenderers shall meet the following minimum qualifying criteria;
 - (a) annual volume of construction work of at least 2.5 times the estimated annual cashflow for the Contract;
 - (b) experience as main contractor in the construction of at least two works of a nature and complexity equivalent to the Works over the last 10 years (to comply with this requirement, works cited should be at least 70 percent complete);
 - (c) proposals for the timely acquisition (own, lease, hire, etc.) of the essential equipment listed as required for the Works;
 - (d) a Contract manager with at least five years' experience in works of an equivalent nature and volume, including no less than three years as Manager; and
 - (e) Liquid assets and/or credit facilities, net of other contractual commitments and exclusive of any advance payments which may be made under the Contract, of no less than 4 months of the estimated payment flow under this Contract.
 - (f) The figures for each of the partners of a joint venture shall be added together to determine the tenderer's compliance with the minimum qualifying criteria of clause 1.6 (a) and (e); however, for a joint venture to qualify, each of its partners must meet at least 25 percent of minimum criteria 1.6 (a), (b) and (e) for an individual tenderer, and the partner in charge at least 40 percent of those minimum criteria. Failure to comply with this requirement will result in rejection of the joint venture's tender. Subcontractors' experience and resources will not be taken into account in

determining the tenderer's compliance with the qualifying criteria, unless otherwise stated.

- 1.7 Each tenderer shall submit only one tender, either individually or as a partner in a joint venture. A tenderer who submits or participates in more than one tender (other than as a subcontractor or in cases of alternatives that have been permitted or requested) will cause all the proposals with the tenderer's participation to be disqualified.
- 1.8 The tenderer shall bear all costs associated with the preparation and submission of his tender, and the Employer will in no case be responsible or liable for those costs.
- 1.9 The tenderer, at the tenderer's own responsibility and risk, is encouraged to visit and examine the Site of the Works and its surroundings, and obtain all information that may be necessary for preparing the tender and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the tenderer's own expense.

2. Tender Documents

- 2.1 The complete set of tender documents comprises the documents listed below and any addenda issued in accordance with Clause 2.4.
 - (a) These Instructions to Tenderers
 - (b) Form of Tender and Qualification Information
 - (c) Specifications
 - (d) Drawings
 - (e) Bills of Quantities
 - (f) Forms of Securities
- 2.2 The tenderer shall examine all Instructions, Forms to be filled and Specifications in the tender documents. Failure to furnish all information required by the tender documents, or submission of a tender not substantially responsive to the tendering documents in every respect will be at the tenderer's risk and may result in rejection of his tender.
- 2.3 A prospective tenderer requiring any clarification of the tendering documents may notify the Employer in writing or by cable, telex or facsimile at the address indicated in the letter of invitation to tender. The Employer will only respond to requests for clarification received earlier than seven days prior to the deadline for submission of tenders. Copies of the Employer's response will be forwarded to all persons issued with tendering documents, including a description of the inquiry, but without identifying its source.
- 2.4 Before the deadline for submission of tenders, the Employer may modify the tendering documents by issuing addenda. Any addendum thus issued shall be part of the tendering documents and shall be communicated in writing or by cable, telex or facsimile to all tenderers. Prospective tenderers shall acknowledge receipt of each addendum in writing to the Employer.
- 2.5 To give prospective tenderers reasonable time in which to take an addendum into account in preparing their tenders, the Employer shall extend, as necessary, the deadline for submission of tenders, in accordance with Clause 4.2 here below.

3. Preparation of Tenders

- 3.1 All documents relating to the tender and any correspondence shall be in English language.
- 3.2 The tender submitted by the tenderer shall comprise the following:
- (a) These Instructions to Tenderers, Form of Tender, Conditions of Contract, Appendix to Conditions of Contract and Specifications;
 - (b) Tender Security;
 - (c) Priced Bill of Quantities;
 - (d) Qualification Information Form and Documents;
 - (e) Alternative offers where invited; and
 - (f) Any other materials required to be completed and submitted by the tenderers.
- 3.3 The tenderer shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items for which no rate or price is entered by the tenderer will not be paid for when executed and shall be deemed covered by the other rates and prices in the Bill of Quantities. All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause relevant to the Contract, as of 30 days prior to the deadline for submission of tenders, shall be included in the tender price submitted by the tenderer.
- 3.4 The rates and prices quoted by the tenderer shall only be subject to adjustment during the performance of the Contract if provided for in the Appendix to Conditions of Contract and provisions made in the Conditions of Contract. **NB: THE PRICES SHALL NOT BE ADJUSTED. THE CONTRACT SHALL BE FIXED PRICE.**
- 3.5 The unit rates and prices shall be in Kenya Shillings.
- 3.6 Tenders shall remain valid for a period of 90 days from the date of submission. However, in exceptional circumstances, the Employer may request that the tenderers extend the period of validity for a specified additional period. The request and the tenderers' responses shall be made in writing. A tenderer may refuse the request without forfeiting the Tender Security. A tenderer agreeing to the request will not be required or permitted to otherwise modify the tender, but will be required to extend the validity of Tender Security for the period of the extension, and in compliance with Clause 3.7 - 3.11 in all respects.
- 3.7 The tenderer shall furnish, as part of the tender, a Tender Security for the amount specified in the invitation to tender. This shall be in the form of a bank draft or a bank guarantee from an established and reputable bank approved by the Employer.
- 3.8 The format of the Tender Security should be in accordance with the form of Tender Security included herein or any other form acceptable to the Employer. Tender Security shall be valid for 30 days beyond the validity of the tender.
- 3.9 Any tender not accompanied by an acceptable Tender Security shall be rejected. The Tender Security of a joint venture must define as "Tenderer" all joint venture partners and

list them in the following manner: a joint venture consisting of””,”, and “.....”.

- 3.10 The Tender Securities of unsuccessful tenderers will be returned within 28 days of the end of the tender validity period specified in Clause 3.6.
- 3.11 The Tender Security of the successful tenderer will be discharged when the tenderer has signed the Contract Agreement and furnished the required Performance Security.
- 3.12 The Tender Security may be forfeited
- (a) if the tenderer withdraws the tender after tender opening during the period of tender validity;
 - (b) if the tenderer does not accept the correction of the tender price, pursuant to Clause 5.7;
 - (c) in the case of a successful tenderer, if the tenderer fails within the specified time limit to
 - (g) sign the Agreement, or
 - (ii) furnish the required Performance Security.
- 3.13 Tenderers shall submit offers that comply with the requirements of the tendering documents, including the basic technical design as indicated in the Drawings and Specifications. Alternatives will not be considered, unless specifically allowed in the invitation to tender. If so allowed, tenderers wishing to offer technical alternatives to the requirements of the tendering documents must also submit a tender that complies with the requirements of the tendering documents, including the basic technical design as indicated in the Drawings and Specifications. In addition to submitting the basic tender, the tenderer shall provide all information necessary for a complete evaluation of the alternative, including design calculations, technical specifications, breakdown of prices, proposed construction methods and other relevant details. Only the technical alternatives, if any, of the lowest evaluated tender conforming to the basic technical requirements shall be considered.
- 3.14 The tenderer shall prepare one original of the documents comprising the tender documents as described in Clause 3.2 of these Instructions to Tenderers, bound with the volume containing the Form of Tender, and clearly marked “ORIGINAL”. In addition, the tenderer shall submit copies of the tender, in the number specified in the invitation to tender, and clearly marked as “COPIES”. In the event of discrepancy between them, the original shall prevail.
- 3.15 The original and all copies of the tender shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the tenderer, pursuant to Clause 1.5 (a) or 1.6 (b), as the case may be. All pages of the tender where alterations or additions have been made shall be initialed by the person or persons signing the tender.

4. Submission of Tenders

- 4.1 The tenderer shall seal the original and all copies of the tender in two inner envelopes and one outer envelope, duly marking the inner envelopes as “**ORIGINAL**” and “**COPIES**” as appropriate. **NB: TENDERERS TO PROVIDED 1 ORIGINAL AND 1 COPY OF THE TENDER.** The inner and outer envelopes shall:
- (a) be addressed to the Employer at the address provided in the invitation to tender;
 - (b) bear the name and identification number of the Contract as defined in the invitation to tender; and
 - (c) provide a warning not to open before the specified time and date for tender opening.
- 4.2 Tenders shall be delivered to the Employer at the address specified above not later than the time and date specified in the invitation to tender. However, the Employer may extend the deadline for submission of tenders by issuing an amendment in accordance with Sub-Clause 2.5 in which case all rights and obligations of the Employer and the tenderers previously subject to the original deadline will then be subject to the new deadline.
- 4.3 Any tender received after the deadline prescribed in clause 4.2 will be returned to the tenderer un-opened.
- 4.4 Tenderers may modify or withdraw their tenders by giving notice in writing before the deadline prescribed in clause 4.2. Each tenderer’s modification or withdrawal notice shall be prepared, sealed, marked, and delivered in accordance with clause 3.13 and 4.1, with the outer and inner envelopes additionally marked “**MODIFICATION**” and “**WITHDRAWAL**”, as appropriate. No tender may be modified after the deadline for submission of tenders.
- 4.5 Withdrawal of a tender between the deadline for submission of tenders and the expiration of the period of tender validity specified in the invitation to tender or as extended pursuant to Clause 3.6 may result in the forfeiture of the Tender Security pursuant to Clause 3.11.
- 4.6 Tenderers may only offer discounts to, or otherwise modify the prices of their tenders by submitting tender modifications in accordance with Clause 4.4 or be included in the original tender submission.

5. Tender Opening and Evaluation

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

- 5.3 Information relating to the examination, clarification, evaluation, and comparison of tenders and recommendations for the award of Contract shall not be disclosed to tenderers or any other persons not officially concerned with such process until the award to the successful tenderer has been announced. Any effort by a tenderer to influence the Employer's officials, processing of tenders or award decisions may result in the rejection of his tender.
- 5.4 To assist in the examination, evaluation, and comparison of tenders, the Employer at his discretion, may ask any tenderer for clarification of the tender, including breakdowns of unit rates. The request for clarification and the response shall be in writing or by cable, telex or facsimile but no change in the price or substance of the tender shall be sought, offered, or permitted except as required to confirm the correction of arithmetic errors discovered in the evaluation of the tenders in accordance with Clause 5.7.
- 5.5 Prior to the detailed evaluation of tenders, the Employer will determine whether each tender (a) meets the eligibility criteria defined in Clause 1.7;(b) has been properly signed; (c) is accompanied by the required securities; and (d) is substantially responsive to the requirements of the tendering documents. A substantially responsive tender is one which conforms to all the terms, conditions and specifications of the tendering documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality, or performance of the works; (b) which limits in any substantial way, inconsistent with the tendering documents, the Employer's rights or the tenderer's obligations under the Contract; or (c) whose rectification would affect unfairly the competitive position of other tenderers presenting substantially responsive tenders.
- 5.6 If a tender is not substantially responsive, it will be rejected, and may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation or reservation.
- 5.7 Tenders determined to be substantially responsive will be checked for any arithmetic errors. Errors will be corrected as follows:
- (a) where there is a discrepancy between the amount in figures and the amount in words, the amount in words will prevail; and
 - (b) where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will prevail, unless in the opinion of the Employer, there is an obvious typographical error, in which case the adjustment will be made to the entry containing that error.
 - (c) In the event of a discrepancy between the tender amount as stated in the Form of Tender and the corrected tender figure in the main summary of the Bill of Quantities, the amount as stated in the Form of Tender shall prevail.
 - (d) The Error Correction Factor shall be computed by expressing the difference between the tender amount and the corrected tender sum as a percentage of the corrected Builder's Work (i.e. Corrected tender sum less P.C. and Provisional Sums)

- (e) The Error Correction Factor shall be applied to all Builder's Work (as a rebate or addition as the case may be) for the purposes of valuations for Interim Certificates and valuation of variations.
 - (f) The amount stated in the tender will be adjusted in accordance with the above procedure for the correction of errors and, with concurrence of the tenderer, shall be considered as binding upon the tenderer. If the tenderer does not accept the corrected amount, the tender may be rejected and the Tender Security may be forfeited in accordance with clause 3.11.
- 5.8 The Employer will evaluate and compare only the tenders determined to be substantially responsive in accordance with Clause 5.5.
- 5.9 In evaluating the tenders, the Employer will determine for each tender the evaluated tender price by adjusting the tender price as follows:
- (a) making any correction for errors pursuant to clause 5.7;
 - (b) excluding provisional sums and the provision, if any, for contingencies in the Bill of Quantities, but including Dayworks where priced competitively.
 - (c) making an appropriate adjustment for any other acceptable variations, deviations, or alternative offers submitted in accordance with clause 3.12; and
 - (d) making appropriate adjustments to reflect discounts or other price modifications offered in accordance with clause 4.6
- 5.10 The Employer reserves the right to accept or reject any variation, deviation, or alternative offer. Variations, deviations, and alternative offers and other factors which are in excess of the requirements of the tender documents or otherwise result in unsolicited benefits for the Employer will not be taken into account in tender evaluation.
- 5.11 The tenderer shall not influence the Employer on any matter relating to his tender from the time of the tender opening to the time the Contract is awarded. Any effort by the Tenderer to influence the Employer or his employees in his decision on tender evaluation, tender comparison or Contract award may result in the rejection of the tender.
- 5.12 Firms incorporated in Kenya where indigenous Kenyans own 51% or more of the share capital shall be allowed a 10% preferential bias provided that they do not sub-contract work valued at more than 50% of the Contract Price excluding Provisional Sums to a non-indigenous sub-contractor.

6. Award of Contract

- 6.1 Subject to Clause 6.2, the award of the Contract will be made to the tenderer whose tender has been determined to be substantially responsive to the tendering documents and who has offered the lowest evaluated tender price, provided that such tenderer has been determined to be (a) eligible in accordance with the provision of Clauses 1.2, and (b) qualified in accordance with the provisions of clause 1.7 and 1.8.
- 6.2 Notwithstanding clause 6.1 above, the Employer reserves the right to

accept or reject any tender, and to cancel the tendering process and reject all tenders, at any time prior to the award of Contract, without thereby incurring any liability to the affected tenderer or tenderers or any obligation to inform the affected tenderer or tenderers of the grounds for the action.

- 6.3 The tenderer whose tender has been accepted will be notified of the award prior to expiration of the tender validity period in writing or by cable, telex or facsimile. This notification (hereinafter and in all Contract documents called the “Letter of Acceptance”) will state the sum (hereinafter and in all Contract documents called the “Contract Price”) that the Employer will pay the Contractor in consideration of the execution, completion, and maintenance of the Works by the Contractor as prescribed by the Contract.

The notification of award will constitute the formation of the Contract, subject to the tenderer furnishing the Performance Security in accordance with Clause 6.6 and signing the Agreement in accordance with Clause 6.4.

- 6.4 The Agreement will incorporate all agreements between the main contractor and the successful tenderer. The agreement shall be acceptable to the employer.
- 6.5 Within 21 days after receipt of the Letter of Acceptance, the successful tenderer shall deliver to the main contractor a performance Security in the amount stipulated in the Appendix to Conditions of Contract and in the form stipulated in the Tender documents. The Performance Security shall be in the form of a Bank Guarantee, and shall be issued at the tenderer’s option, by a reputable bank located in Kenya and acceptable to the Employer.
- 6.6 Failure of the successful tenderer to comply with the requirements of clause 6.5 shall constitute sufficient grounds for cancellation of the award and forfeiture of the Tender Security.
- 6.7 Upon the furnishing by the successful tenderer of the Performance Security, the Employer will promptly notify the other tenderers that their tenders have been unsuccessful.

APPENDIX TO INSTRUCTIONS TO TENDERERS

The following instructions for tender evaluation shall supplement, complement or amend the instructions to tenderers.

Where there is a conflict between the provisions of instructions to tenderers and this appendix, the provisions of the appendix herein shall prevail.

TENDER EVALUATION CRITERIA

A) Preliminary evaluation (Mandatory requirements)

To be deemed as responsive, tenders shall be checked for the following mandatory requirements:

Item	Description	Remark (×/√)
1	Form of tender dully filled (Original)	
2	Bid security of Kshs Three Hundred Thousand (Kshs 300,000.00) (Original)	
3	Company certificate of registration or incorporation (Provide Copy)	
4	Current registration certificate and practicing license with National Construction Authority (NCA) as a contractor in Electrical Engineering Services {Structured Cabling and Computer Networking Installations; and Security Surveillance Systems (CCTV) intruder Alarm and access control systems} - Category 3 and above. (Provide copies of Current NCA registrations and practicing licenses)	
5	Valid Communications Authority of Kenya (CAK) (Copy)	
6	Valid ICT Authority Certificate (Copy)	
7	VAT/PIN registration certificate (Copy)	
8	Valid tax compliance certificate (Copy)	
9	Filled anti-corruption declaration form (Original)	
10	All pages in the tender document to be serially numbered	
11	Dully filled Tender Questionnaire and Confidential Business Questionnaire (Originals)	
12	Power of attorney where the signatory is not a director (Copies)	
13	Current form CR12 (for companies) and identity documents for the directors/proprietor	
14	Manufacturer's authorization form/letter for CCTV cameras; IP-PABX; Telephone Instruments; Data Switches; Patch Panels; Data Cabinets; Cables and Cabling Accessories and UPS being offered by the bidder	
15	Type approval from Communications Authority of Kenya (CAK) for the IP-PABX being offered by the bidder	
	CONCLUSIVE REMARK	

Tenders that do not meet any of the above requirements shall be disqualified and not considered for further evaluation.

B) Technical evaluation

The tenderers shall be required;

- a) *To fill the Standard Forms provided in the bid document for the purposes of providing the required information. The tenderers may also attach the required information if they so desire;*
- b) *To supply equipment/items which comply with the technical specifications set out in the bid document. In this regard, the bidder will be required to submit relevant technical brochure/catalogues with the tender document, highlighting the Catalogue Number of the proposed items. Such brochures/ catalogues should indicate comprehensive relevant data of the proposed equipment/items which should include but not limited to the following:*
 - (i) *Standards of manufacture;*
 - (ii) *Performance ratings/characteristics;*
 - (iii) *Material of manufacture;*
 - (iv) *Electrical power ratings; and*
 - (v) *Any other necessary requirements (specify).*

The bid will then be analyzed, using the information in the technical brochures, to determine compliance with General and Particular technical specifications for the works as indicated in the tender document. The tenderer shall also fill in the Technical Schedule as specified in the tender document for Equipment's and Items indicating the Country of Origin, Model/Make/Manufacturer and catalogue numbers of the Items/Equipment's they propose to supply.

The award of points considered in this section shall be as shown below:

<u>PARAMETER</u>	<u>MAXIMUM</u>
<u>POINTS</u>	
(i) Compliance with Technical Specifications -----	40
(ii) Qualifications of key personnel -----	12
(iii) Contracts Completed in the last Five (5) years -----	9
(iv) Schedule of on-going projects -----	4
(v) Schedule of contractors equipment -----	12
(vi) Audited Financial Reports for the last 3 years -----	6
(vii) Evidence of Financial Resources -----	9
(viii) Name, Address and Telephone of Bank reference -----	3
(ix) Litigation and Arbitration History -----	5
TOTAL	<u>100</u>

The minimum score for Technical Evaluation is 70 percent.

The detailed scoring plan shall be as shown in table 1 below: -

TABLE 1: Assessment for Eligibility

Item	Description	Point Scored	Max. Point
1	Compliance with Technical Specifications <ul style="list-style-type: none"> Compliant----- 40 Non-compliant ----- 0 (Refer to table 2: compliance with technical specifications)		40
2	Qualifications of Key Personnel (Attach evidence)		
	Director of the firm <ul style="list-style-type: none"> Holder of degree or diploma in relevant Engineering field ---- 4 Holder of certificate in relevant Engineering field ----- 2 Holder of trade test certificate in relevant Engineering field --1 No relevant certificate ----- 0 		4
	At least 1No. degree/diploma of key personnel in relevant field <ul style="list-style-type: none"> With over 10 years relevant experience ----- 4 With over 5 years relevant experience----- 2 With under 5 years relevant experience ----- 1 		4
	At least 1No certificate holder of key personnel in relevant field <ul style="list-style-type: none"> With over 10 years relevant experience----- 2 With over 5 years relevant experience ----- 1 With under 5 years relevant experience -----0.5 		2
	At least 2No artisan (trade test certificate in relevant field) <ul style="list-style-type: none"> Artisan with over 10 years relevant experience ----- 2 Artisan with under 10 years relevant experience ----- 1 Non skilled worker with over 10 years relevant experience -- 0 		2
3	Contracts completed in the last five (5) years (Max of 3 No. Projects)- <u>Provide Evidence</u> <ul style="list-style-type: none"> Project of similar nature, complexity and magnitude (3 Points per project) ----- 9 Project of similar nature but of lower value than the one in consideration (2 Points per project) ----- 6 No completed project of similar nature -----0 		9

PROPOSED LIBRARY FOR KARATINA UNIVERSITY: STRUCTURED CABLING, IP-PABX, CCTV AND ACCESS CONTROL

Item	Description	Point Scored	Max. Point	
4	On-going projects – <u>Provide Evidence</u> <ul style="list-style-type: none">No Project of similar nature, complexity and magnitude - 4Three and below Project of similar, nature complexity and magnitude -----3Four and above project of similar, nature complexity and magnitude -----2		4	
5	Schedule of contractor’s equipment and transport (proof or evidence of ownership/Lease)			12
	a) Relevant Transport <ul style="list-style-type: none">Means of transport (Minimum 1 Vehicle) ----- 6No means of transport ----- 0		6	
	b) Relevant Equipment <ul style="list-style-type: none">Has relevant equipment (Minimum of tool box)----- 6No relevant equipment ----- 0		6	
	Financial reports			
6	Audited financial report (last three (3) years (2017-2019)) <ul style="list-style-type: none">Average Annual Turn-over equal to or greater than the tender sum ----- 6Average Annual Turn-over above 50% but below 100% of the tender sum ----- 3Average Annual Turn-over below 50% of the tender sum----- 1		6	
7	Evidence of Financial Resources (cash in hand, lines of credit, over draft facility etc.) <ul style="list-style-type: none">Has financial resources equal to or greater than the tender sum -----9Has financial resources above 50% but below 100% of the tender sum ----- 6Has financial resources below 50% of the tender sum----3Has not indicated sources of financial resources ----- 0		9	
8	Name, Address and Telephone of Banks (Contractor to Provide) <ul style="list-style-type: none">Information Provided ----- 3No Information Provided ----- 0		3	
9	Litigation and Arbitration History <ul style="list-style-type: none">Provided ----- 5Not filled ----- 0		5	
	TOTAL		100	

Only bidders who scores 70 points and above shall be considered for further evaluation

TABLE 2: Compliance with Technical Specifications

The bidder must comply with all technical specification to be awarded 40marks. Any bidder not complying with any of the specifications shall be awarded a zero marks.

a. Structured Cabling and I.P PABX

Item	Description	Minimum Requirements	Bidders Offer (Ratings/Size/Make/Model/Cat. No./Country of origin)	Compliance with Tender Specification (√ / ×)
1.	Core Switch	<ul style="list-style-type: none"> • LAN Interface-16 SFP+ • Chassis slots-4 • Capacity-500 Gbps Switching Capacity • Port Density-144No. 10/100/1000Base-T Ports with PoE, 144No. Gigabit SFP Slots, 48No. 10-Gigabit SFP+ Slots • power supply- redundant power supply 		
2.	Edge Switch	<ul style="list-style-type: none"> • support 10/100/1000 MBPS on all ports (RJ45) and Gigabit to the desktop connectivity • at least two 1000BaseXGigabit uplink ports for terminating backbone Fiber • support layer 3 routing • IEEE 802.3 compliant for power over Ethernet • forwarding Bandwidth of 64GBPS • 12,000MAC addresses • 24 ports of 10/100/1000 MBPS • support Jumbo frames • Integrated wireless access points controller 		
3.	Data Cabinet	<ul style="list-style-type: none"> • Locking front and rear doors • electrical outlet strip • Top mounted, thermostatically controlled exhaust fan • Management lock and key 		
4.	Cables	<ul style="list-style-type: none"> • UTP Cable - 4pair, category 6A, UTP cable 		

Item	Description	Minimum Requirements	Bidders Offer (Ratings/Size/Make/Model/Cat. No./Country of origin)	Compliance with Tender Specification (√ / ×)
		<i>cable, compliant to ANSI/TIA/EIA-568-B.2</i>		
5.	Faceplates	<i>Data Outlet - 8-pin modular, Category 6A, pinned to T568 (A /B) standards</i>		
6.	Patch Panel	<ul style="list-style-type: none"> • 24Port • 8-pin modular • Category 6A, • pinned to T568 (A /B) standards 		
7.	IP PABX	<ul style="list-style-type: none"> • Fully IP with 50No. extension expandable to 100extensions • Trunk Lines – 8No. expandable to 12No. • GSM – 4No. expandable to 6No. • P.C Console-1 • Operator Head and Handsets – 2No. each • VOIP ready • duplex CPU • ISDN PRI-E1-30 Channels • Branch Connectivity IP Telephony-1No. expandable to 2No. • support five digits extensions numbering plan • unified communication services (voice, video & data convergence) capability • mobile service capability • type approved by the Communications Authority of Kenya • compatible for connection to Telkom Ltd, Safaricom networks, Airtel etc. 		
8.	Standard IP telephone instrument	<ul style="list-style-type: none"> • IP- telephone facilities • Backlit touch, liquid crystal display (LCD) and embedded softkeys 		

PROPOSED LIBRARY FOR KARATINA UNIVERSITY: STRUCTURED CABLING, IP-PABX, CCTV AND ACCESS CONTROL

Item	Description	Minimum Requirements	Bidders Offer (Ratings/Size/Make/Model/Cat. No./Country of origin)	Compliance with Tender Specification (√ / ×)
		<ul style="list-style-type: none"> • <i>full-duplex speakerphone</i> • <i>Several fixed feature keys</i> • <i>User configurable transmission control protocol (TCP) and user datagram protocol (UDP) port number</i> • <i>Network Port (10/100/1000 SW)</i> • <i>Access Port (10/100/1000 PC)</i> 		
9.	Executive IP telephone instrument	<ul style="list-style-type: none"> • <i>IP- telephone facilities</i> • <i>Backlit touch, liquid crystal display (LCD) and embedded softkeys</i> • <i>Feature buttons for quick access</i> • <i>full-duplex speakerphone and dedicated headset support</i> • <i>Upgradeable through software</i> • <i>User configurable transmission control protocol (TCP) and user datagram protocol (UDP) port number</i> • <i>Network Port (10/100/1000 SW)</i> • <i>Access Port (10/100/1000 PC)</i> 		
	Marks Awarded			

b. CCTV and Access Control

Item	Major Equipment	Minimum Requirements	Bidders-Offer (Ratings/Size/Make/ Model/Cat. No./ Country of origin)	Compliance with Tender Specification (✓ / ×)
1	IP Bullet camera (CCTV camera Type 1)	<ul style="list-style-type: none"> Resolution: <i>5Mega Pixel</i> IR Viewable Length: <i>30 meters minimum</i> Imaging sensor: <i>1/1.8'' minimum</i> Wide Dynamic Range: <i>120dB</i> Lens: <i>Fixed Lens length of 3.7 mm</i> Ethernet: <i>IP Capable (RJ-45)</i> Power: <i>A/C, D/C and PoE inputs</i> Ingress Protection/Vandal Resistance: <i>IP67/IK10</i> Video Compression: <i>H265</i> Edge Storage: <i>minimum 64GB internal MicroSD card slot</i> Vision Capability: <i>Auto ICR</i> Video Analytics: <i>Tampering detection, Loitering, Face Detection, Audio Detection, Motion detection, Sound Classification, Heat map, People Counting, Queue management, defocus detection, Bi-directional audio I/O communication, Network Disconnect, defog</i> Programming Interface: <i>ONVIF Compliant</i> 		
2	IP PTZ CCTV Camera (CCTV camera Type 2)	<ul style="list-style-type: none"> Resolution: <i>2Mega Pixel</i> IR Viewable Length: <i>150 meters minimum</i> Imaging sensor: <i>1/2.8'' minimum</i> Wide Dynamic Range: <i>120dB</i> Lens: <i>Varifocal Auto Iris lens-focal length 4.5~140mm</i> Zoom Ratio: <i>32x optical</i> Ethernet: <i>IP Capable (RJ-45)</i> Power: <i>A/C, D/C and PoE inputs</i> Ingress Protection/Vandal Resistance: <i>IP67/IK10</i> Video Compression: <i>H264</i> Edge Storage: <i>minimum 64GB internal MicroSD card slot</i> Vision Capability: <i>Auto ICR</i> Video Analytics: <i>Tampering detection, Face detection, Audio Detection, Enter/Exit, Appear/Disappear</i> 		

Item	Major Equipment	Minimum Requirements	Bidders-Offer (Ratings/Size/Make/ Model/Cat. No./ Country of origin)	Compliance with Tender Specification (✓ / ×)
		<ul style="list-style-type: none"> Programming Interface: <i>ONVIF Compliant</i> 		
3	IP Dome CCTV Camera (CCTV camera Type 3)	<ul style="list-style-type: none"> IP 12MP High Definition 4k Vandal Proof Dome camera 1/1.7" CMOS imaging sensor with 120db WDR. Motorized Varifocal length of 4.5 to 10 mm lens IR Viewable Length 40m Minimum illumination 0.3lux (colour) Frame rate of 30fps at 8MP True day and night vision capability (ICR) IP network capable – IPv4/IPv6 PoE capability H.265 video compression Tampering detection, Audio Detection, Motion detection, defocus detection, Bi-directional audio I/O communication, Network Disconnect, defog and event triggered alarm processing Masking Accessible Edge Storage with internal 128GB MicroSD card slot and complete with a 128GB MicroSD card ONVIF compliant application programming interface Web viewer/browser support Vandal proof IK-10 rating housing Weather proof IP66 rating 		
4	IP Dome CCTV Camera (CCTV camera Type 4)	<ul style="list-style-type: none"> Resolution: <i>5Mega Pixel</i> IR Viewable Length: <i>50 meters minimum</i> Imaging sensor: <i>1/3'' minimum</i> Wide Dynamic Range: <i>120dB</i> Lens: <i>Varifocal Auto Iris lens-focal length 3-12mm</i> Zoom Ratio: <i>4x</i> Ethernet: <i>IP Capable (RJ-45)</i> Power: <i>A/C, D/C and PoE inputs</i> Ingress Protection/Vandal Resistance: <i>IP67/IK10</i> Video Compression: <i>H265</i> Edge Storage: <i>minimum 64GB internal MicroSD card slot</i> Vision Capability: <i>Auto ICR</i> Video Analytics: <i>Tampering detection, Motion detection, defocus detection, Face Detection, Audio detection, Digital Auto</i> 		

Item	Major Equipment	Minimum Requirements	Bidders-Offer (Ratings/Size/Make/ Model/Cat. No./ Country of origin)	Compliance with Tender Specification (✓ / ×)
		<i>tracking, People counting, heat mapping, Queue management, sound classification and hallway view.</i> <ul style="list-style-type: none"> Programming Interface: <i>ONVIF Compliant</i> 		
5	IP Indoor PTZ CCTV Camera (CCTV camera Type 5)	<ul style="list-style-type: none"> Resolution: <i>2Mega Pixel</i> Imaging sensor: <i>1/2.8'' minimum</i> Wide Dynamic Range: <i>150dB</i> Lens: <i>Auto Iris lens</i> Illumination(min): <i>0.01lux-colour, 0.001-B/W</i> Zoom: <i>24x digital PTZ</i> Ethernet: <i>IP Capable (RJ-45)</i> Power: <i>A/C, D/C and PoE inputs</i> Video Compression: <i>H265</i> Edge Storage: <i>minimum 64GB internal MicroSD card slot</i> Vision Capability: <i>Auto ICR</i> Video Analytics: <i>Tampering detection, Face detection, Audio Detection, Motion detection, Sound Classification, fog detection and event triggered alarm processing</i> Programming Interface: <i>ONVIF Compliant</i> 		
6	NETWORK VIDEO RECORDER	<ul style="list-style-type: none"> Channels: <i>64</i> Recording speeds: <i>400Mbps</i> Ethernet connection: <i>Gigabit</i> Multi screen Display: <i>Full/4/9/16 way or as appropriate.</i> Hard Disk Drives: <i>10 Hot swap HDDs (RAID 5)</i> External Storage: <i>external storage support capability</i> Monitor: <i>VGA/HDMI local monitor</i> Power Supply: <i>Redundant hot swap power supply</i> Video analysis: <i>In built intelligent video analysis</i> Video Compression: <i>H.265, MPEG, MJPEG</i> Programming Interface: <i>ONVIF compatibility</i> Web viewer: <i>supported</i> PoE: <i>PoE enabled</i> Storage capacity: <i>96TB</i> Streamlined Investigations: <i>Smart Video Search Feature</i> 		

Item	Major Equipment	Minimum Requirements	Bidders-Offer (Ratings/Size/Make/ Model/Cat. No./ Country of origin)	Compliance with Tender Specification (✓ / ×)
		<ul style="list-style-type: none"> Recording resolution: <i>5MP</i> Other Key Features: IP address filtering, user access log, authentication and encryption; Auto Launch of Video on specified Alarms/Events; Network management/viewer software; Smartphone support 		
7	CORE SWITCH	<ul style="list-style-type: none"> LAN Interface Modules: <i>16 SFP+</i> Chassis Slots: <i>4</i> Fixed Slots (for Control Modules): <i>1</i> Open Slots (for Port Modules): <i>3</i> Max. Switching Capacity: <i>500 Gbps</i> Max. Packet Forwarding Rate: <i>400Mbps</i> Maximum Port Density: <i>10/100/1000Base-T Ports-144; 10/100/1000Base-T Ports with PoE:144</i> Gigabit SFP Slots:<i>144</i> 10-Gigabit SFP+ Slots: <i>48</i> Power supply: <i>The core switch should have redundant power supply, redundant fan tray and redundant CPU/supervisor engine installed</i> MAC Address Table: <i>32K per I/O module</i> Dimensions: <i>≤ 8U</i> 		
8	EDGE SWITCH	<ul style="list-style-type: none"> Active control equipment at the LAN Edge should <i>support 10/100/1000 MBPS on all ports (RJ45) and Gigabit to the camera connectivity</i> Uplink ports for terminating backbone Fiber: <i>two 1000BaseXGigabit.</i> The equipment should <i>support layer 3 routing.</i> Should support <i>IEEE 802.1, SSH, SNMP.</i> Switch Fabric forwarding Bandwidth: <i>64GBPS or more.</i> MAC addresses: <i>More than 12,000 should be available on each switch.</i> The switches should have <i>24/48 ports of 10/100/1000 MBPS.</i> <i>Each stack on the edge will have two links of Fiber to the core switch, totaling two fiber terminations from the core switch to the stack.</i> Should <i>support Jumbo frames.</i> 		

Item	Major Equipment	Minimum Requirements	Bidders-Offer (Ratings/Size/Make/ Model/Cat. No./ Country of origin)	Compliance with Tender Specification (✓ / ×)
		<ul style="list-style-type: none"> Total stack <i>throughput bandwidth of 64 GBPS or more.</i> Active Edge switches should be quoted with a <i>minimum of One year of warranty</i> covering free replacement of parts and units. The switches to be <i>PoE plus</i> 		
	Marks Awarded			

C) Financial evaluation

Stage 1

Tenders shall be checked for arithmetic errors, inconsistencies and frontloading and subjected to the requirements of clause 5.7 of instructions to tenderers.

Stage 2 and post qualification

The lowest evaluated tender having passed stage 1 above shall be the winning bid subject to the employer's right to exercise due diligence relating to confirmation of information submitted by the bidder. Any bidder who shall be found to have supplied false or misleading information shall be disqualified and the next lowest tender that has passed stage 1 shall be considered.

PARTICULAR SPECIFICATIONS

EMPLOYER

The “Employer” is the **KARATINA UNIVERSITY** whose address unless otherwise notified is **P.O. BOX 1957-10101 KARATINA**.

PROJECT MANAGER

The term "P.M." wherever used in the Bills of Quantities shall be deemed to imply the Project Manager as defined in the Conditions of Contract or such person or persons as may be duly authorized to represent him.

ARCHITECT

The term “Architect” shall be deemed to mean “The P.M.” as defined above whose address unless otherwise notified is JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY ENTERPRISES LTD (JKUATES), P.O. BOX 62000-00200 NAIROBI.

QUANTITY SURVEYOR

The term “Quantity Surveyor” shall be deemed to mean “The P.M.” as defined above.

ELECTRICAL ENGINEER

The term “Electrical Engineer” shall be deemed to mean “The P.M.” as defined above.

MECHANICAL ENGINEER

The term “Mechanical Engineer” shall be deemed to mean “The P.M.” as defined above.

STRUCTURAL ENGINEER

The term “Structural Engineer” shall be deemed to mean “The P.M.” as defined above.

THE CONTRACTOR OR MAIN CONTRACTOR

The term ‘contractor’ or ‘main contractor’ shall be deemed to mean the firm appointed by the employer to carry out the main building works. The terms ‘contractor’ and ‘main contractor’ shall be synonymous.

WORKS

The expression ‘work’ or ‘works’ shall mean all or any portion of the work, material and plant to be provided and the labour to be performed for the execution and in fulfillment of this contract, and whether the same may be on site or not.

THE SITE

The proposed works shall be situated at KAGOCI, MATHIRA SUB-COUNTY, NYERI COUNTY.

The tenderer is advised to visit the site and will be deemed to have satisfied himself with regard to the existing conditions thereof, the means of access, the risk of injury or damage to existing property and property adjacent to the site or to the occupiers of such property. No claim by the contractor will be allowed on the ground of any misunderstanding or misapprehension in respect of any such matter or otherwise.

The contractor must obtain the approval of the Engineer regarding the use of any materials found on the site.

GENERAL DESCRIPTION OF THE WORKS

The works comprise supply, installation and commissioning of **Structured Cabling, IP-PABX, CCTV and Access and Control installation.**

SPECIFICATION

Shall mean the whole of the contract document including but not restricted to:-

- a) This document comprising definitions and preliminaries, General specifications, particular specifications and schedules as contained herein.
- b) The contract drawings.

BILLS OF QUANTITIES

Where the term 'Bills of Quantities' bears any relation to subcontract, it shall mean the 'specification' and the prices or any other schedules contained therein.

CONTRACT DRAWINGS

Shall mean those drawings listed in the schedules or referred to herein, forming part of this specification.

MANUFACTURER'S RECOMMENDATIONS

Shall mean the manufacturer's recommendation or instructions, printed or in writing and current at the time of execution of the works.

OR OTHER APPROVED

Shall mean that commodities of a manufacturer other than that specified by the proprietary name may be substituted provided they meet the standards specified and that express approval has been obtained from the Engineer. The rates of prices will be held to be of the commodity specified and current at the time of tender.

PROPRIETARY NAME

The phrase 'or other approved' shall be deemed to be included in every case where commodities are specified by proprietary name.

APPROVED, DIRECTED AND SELECTED

Shall mean approved, directed or selected by the Engineer and shall not be binding unless put in writing and signed by the Engineer.

ABBREVIATIONS

NO	-	shall mean number
m	-	shall mean metre
L.M	-	shall mean linear metre
mm	-	shall mean millimetre
kg	-	shall mean kilogramme
Ltr.	-	shall mean litre
S.S	-	shall mean stainless steel
G.M.S	-	shall mean galvanised mild steel
M.O.P.W-		shall mean ministry of public works
B.S	-	shall mean the Current British standards specification published by The British standard Institution
C.P	-	shall mean the current British standard code of practice published together with the B.S
I.E.E	-	shall mean the Institute of Electrical Engineers, Savoy Place , London.
I.S.O	-	shall mean the International organization for standardization
K.B.S	-	shall mean the Kenya Bureau of Standards.
Ditto	-	shall mean the whole of the preceding description except as qualified in the description in which it occurs.

GENERAL SPECIFICATIONS OF MATERIALS AND WORKS

This specification is to be read in conjunction with any other information herein issued with it. Bills of quantities and schedule of unit rates shall be the basis of all additions and omissions during the progress of the works.

STANDARD OF MATERIALS

Where the material and equipment are specifically described and named in the Specification followed by approved equal, they are so named or described for the purpose of establishing a standard to which the contractor shall adhere.

Should the contractor install any material not specified herein before receiving approval from the proper authorities, the Engineer shall direct the contractor to remove the material in question immediately. The fact that this material has been installed shall have no bearing or influence on the decision by the Engineer.

All materials condemned by the Engineer as not approved for use, are to be removed from the premises and suitable materials delivered and installed in their place at the expense of the Contractor. All materials required for the works shall be from branded manufacturers, and shall be new and the best of the respective kind and shall be of a uniform pattern.

WORKMANSHIP

The workmanship and method of installation shall conform to the best standard practice. All work shall be performed by a skilled tradesman and to the satisfaction of the Engineer. Helpers shall have qualified supervision.

Any work that does not in the opinion of the Engineer conform to the best standard practice will be removed and reinstated at the contractor's expense.

Permits, Certificates or Licences must be held by all tradesmen for the type of work; in which they are involved where such permits, certificates or licences exist under Government legislation.

PROCUREMENT OF MATERIALS

The contractor is advised that no assistance can be given in the procurement or allotment of any materials or products to be used in and necessary for the construction and completion of the work.

Contractors are warned that they must make their own arrangements for the supply of materials and/or products specified or required. Where necessary, advance payment shall be granted as stipulated in the Appendix to Instruction to Tenderers clause 9 page A/17

RECORD DRAWINGS

These diagrams and drawings shall show the completed installation including sizes, runs and arrangements of the installation. The drawings shall be to scale not less than 1:50 and shall include plan views and section.

The drawings shall include all the details which may be useful in the operation, maintenance or subsequent modifications or extensions to the installation.

Three sets of diagrams and drawings shall be provided, all to the approval of the Engineer.

One coloured set of line diagrams relating to operating and maintenance instructions shall be framed and, mounted in a suitable location.

REGULATIONS AND STANDARDS

All work executed by the contractor shall comply with the current edition of the “Regulations” for the Electrical Equipment of Buildings, issued by the Institution of Electrical Engineers, Electric Power Act, Kenya Bureau of Standards (KBS), Institution of Electrical Engineers (I.E.E) Wiring Regulations, Current recommendation of CCITT and CCIR, and with the Regulations of the Local Electricity Authority and the Communications Authority of Kenya (CAK)

Where the sets of regulations appear to conflict, they shall be clarified with the Engineer.

SETTING OUT WORK

The contractor, at his own expenses, is to set out works and take all measurements and dimensions required for the erection of his materials on site; making any modifications in details as may be found necessary during the progress of the works, submitting any such modifications or alterations in detail to the Engineer before proceeding and must allow in his tender for all such modifications and for the provision of any such sketches or drawings related thereto.

TESTING ON SITE

The contractor shall conduct during and at the completion of the installation and, if required, again at the expiration of the maintenance period, tests in accordance with the relevant section of the current edition of the Regulations for the electrical equipment of buildings issued by the I.E.E of Great Britain, the Government Electrical Specifications No. 1 and No.2, Electric Supply Company’s By-Laws, Communications Authority of Kenya (CAK) requirements or any other supplementary Regulations as may be produced by the engineer.

Any faults, defects or omissions or faulty workmanship, incorrectly positioned or installed parts of the installation shall be rectified by the contractor at his own expense.

PARTICULAR SPECIFICATIONS OF MATERIALS AND WORKS

PART-1: TELECOMMUNICATIONS DISTRIBUTION SYSTEM – STRUCTURED CABLING

A. GENERAL TECHNICAL SPECIFICATIONS

- a. Section Includes: Equipment, materials, labor, and services to provide telephone and data distribution system including but not limited to:
 1. Telephone and data cabling terminations
 2. Optical fiber and terminations
 3. Data/voice outlets
 4. Terminal blocks/cross-connect systems
 5. Equipment racks and cabinets
 6. System testing
 7. Documentation and submissions
 8. Surface trunking, cable ladder
 9. Core switch, edge switches
- b. Provide all equipment, materials, labor, and services, not specifically mentioned or shown, which may be necessary to complete or perfect all parts of the installation. Ensure that they are in compliance with requirements stated or reasonably inferred by the contract documents.

1. REFERENCES

- a. Design, manufacture, test, and install telecommunications cabling networks per manufacturer's requirements and in accordance with NFPA-70 (*National Electrical Code®*)/IEEE Regulations, state codes, local codes, requirements of authorities having jurisdiction, and particularly the following standards: ANSI/NECA/BICSI-568 -- Standard for Installing Commercial Building Telecommunications Cabling ANSI/TIA/EIA Standards.
 - 1) ANSI/TIA/EIA-568-B.1 -- *Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements*
 - 2) ANSI/TIA/EIA-568-B.2 -- *Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components*
 - 3) ANSI/TIA/EIA-568-B.3 -- *Optical Fiber Cabling Components Standard*
 - 4) ANSI/TIA/EIA-569-A -- *Commercial Building Standard for Telecommunications Pathways and Spaces*
 - 5) ANSI/TIA/EIA-606(A) -- *The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings*
 - 6) ANSI/TIA/EIA-607(A) -- *Commercial Building Grounding and Bonding Requirements for Telecommunications*
 - 7) ANSI/TIA/EIA-526-7 -- *Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant*
 - 8) ANSI/TIA/EIA-526-14A -- *Measurement of Optical Power Loss of Installed Multimode Fiber Cable Plant*
 - 9) ANSI/TIA/EIA-758(A) -- *Customer-Owned Outside Plant Telecommunications Cabling Standard*
 - 10) ISO/IEC 1101 Amendment 2

- b. Local codes, rules, regulations, and ordinances governing the work, are as fully part of the specifications as if herein repeated or hereto attached. If the contractor should note items in the drawings or the specifications, construction of which would be code violations, promptly call them to the attention of the Project Manager in writing. Where the requirements of other sections of the specifications are more stringent than applicable codes, rules, regulations, and ordinances, the specifications shall apply.

2. PERMITS, FEES, AND CERTIFICATES OF APPROVAL

- a. The Contractor to include the cost of application and pay for building permit.
- b. As prerequisite to final acceptance, supply to the client certificates of inspection from an inspection agency acceptable to the owner and approved by local municipality and utility company serving the Project Manager.

3. SYSTEM DESCRIPTION

- a. A telecommunications cabling system generally consists of one telecommunications outlet in each workstation, wall telephones in common and power socket outlet.
 - b. The typical work area consists of a single-gang plate with two standards compliant work area outlets.
 - c. One work area outlet consists of one (1) four-pair data Category 6 cable or above, installed from work area outlet to the data cabinet. Terminate data cables on modular patch panels located in the appropriate data cabinet.
 - d. One work area outlet consists of one (1) four-pair screened (ScTP) cable installed from work area outlet to the data termination rack in the cabinet. Terminate data cables on rack mounted modular patch panels.
- 2.1 Vertical/horizontal copper backbone cabling consists of multiple pair unshielded twisted-pair installed from the main cross-connect (MC) to the horizontal cross-connect (HC) and/or from the MC to the intermediate cross-connect (IC) to the HC.
- 2.2 Vertical/horizontal backbone cabling consists of 62.5/125 μm multimode optical fiber cable installed from the MC to the HC and/or from the MC to the IC to the HC.
- 2.3 Vertical/horizontal backbone cabling consists of 50/125 μm multimode optical fiber cable installed from the MC to the HC and/or from the MC to the IC to the HC. *Specification Note: State what this backbone will be utilized for. Examples are voice telecommunications service, premises switching equipment, data communications, etc.*

4. SUBMITTALS

- a. Submit to the P.M shop drawings, product data (including cut sheets and catalog information), and samples required by the contract documents. Submit shop drawings, product data, and samples with such promptness and in such sequence as to cause no delay in the work or in the activities of separate contractors. The engineer will indicate approval of shop drawings, product data, and samples submitted to the engineer by stamping such submittals "APPROVED" with a stamp. Submitted shop drawings shall be initialed or signed by the contractor, showing the date and the contractor's legitimate firm name.

- 1) By submitting shop drawings, product data, and samples, the contractor represents that he or she has carefully reviewed and verified materials, quantities, field measurements, and field construction criteria related thereto. It also represents that the contractor has checked, coordinated, and verified that information contained within shop drawings, product data, and samples conform to the requirements of the work and of the contract documents. The engineer/designer remains responsible for the design concept expressed in the contract documents as defined herein.
- 2) The P.M approval of shop drawings, product data, and samples submitted by the contractor shall not relieve the contractor of responsibility for deviations from requirements of the contract documents, unless the contractor has specifically informed the engineer/designer in writing of such deviation at time of submittal, and the engineer/designer has given written approval of the specific deviation. The contractor shall continue to be responsible for deviations from requirements of the contract documents not specifically noted by the contractor in writing, and specifically approved by the engineer in writing.
- 3) The P.M approval of shop drawings, product data, and samples shall not relieve the contractor of responsibility for errors or omissions in such shop drawings, product data, and samples.
- 4) The P.M review and approval, or other appropriate action upon shop drawings, product data, and samples, is for the limited purpose of checking for conformance with information given and design concept expressed in the contract documents. The engineer's review of such submittals is not conducted for the purpose of determining accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the contractor as required by the contract documents.

The review shall not constitute approval of safety precautions or of construction means, methods, techniques, sequences, or procedures. The P.M approval of a specific item shall not indicate approval of an assembly of which the item is a component.

b. Shop drawings: Submit the following:

Coordinate with Part 2.

- 1) *Backbone (riser) diagrams*
- 2) *System block diagram, indicating interconnection between system components and subsystems*
- 3) *Interface requirements, including connector types and pin-outs, to external systems and systems or components not supplied by the contractor*
- 4) *Fabrication drawings for custom-built equipment*

c. Product Data -- Provide catalog cut sheets and information for the following:
Coordinate with Part 2.

- 1) Wire, cable, and optical fiber
- 2) Outlets, jacks, faceplates, and connectors
- 3) All metallic and nonmetallic raceways, including surface raceways, outlet boxes, and fittings
- 4) Terminal blocks and patch panels
- 5) Enclosures, racks, and equipment housings
- 6) Over-voltage protectors
- 7) Splice housings

d. Samples - Submit samples as required by the Engineer.

e. Project record drawings:

- 1) Submit project record drawings at conclusion of the project and include:
 - (a) Approved shop drawings.
 - (b) Plan drawings indicating locations and identification of work area outlets, nodes, data cabinet rooms, and backbone (riser) cable runs.
 - (c) Cross-connect schedules including entrance point, main cross-connects, intermediate cross-connects, and horizontal cross-connects.
 - (d) Labeling and administration documentation.
 - (e) Warranty documents for equipment.
 - (f) Copper certification test result printouts and diskettes.
 - (g) Optical fiber power meter/light source test results.
 - (h) Operation and maintenance manuals:

5. QUALITY ASSURANCE

- 1.1 The contractor shall have worked satisfactorily for a minimum of five (5) years on systems of this type and size.
- 1.2 Upon request by the P.M, furnish a list of references with specific information regarding type of project and involvement in providing of equipment and systems.
- 1.3 Equipment and materials of the type for which there are independent standard testing requirements, listings, and labels, shall be listed and labeled by the independent testing laboratory.
- 1.4 Where equipment and materials have industry certification, labels, or standards (i.e., NEMA - National Electrical Manufacturers Association), this equipment shall be labeled as certified or complying with standards.
- 1.5 Material and equipment shall be new, and conform to grade, quality, and standards specified. Equipment and materials of the same type shall be a product of the same manufacturer throughout.
- 1.6 Subcontractors shall assume all rights and obligations toward the contractor that the contractor assumes toward the client and P.M.

5. WARRANTY

- 5.1 Unless otherwise specified, unconditionally guarantee in writing the materials, equipment, and workmanship for a period of not less than fifteen (15) years from date of commissioning of the project for active components.
- 5.2 Transfer manufacturer's warranties to the owner in addition to the General System Guarantee. Submit these warranties on each item in list form with shop drawings. Detail specific parts within equipment that are subject to separate conditional warranty. Warranty proprietary equipment and systems involved in this contract during the guarantee period. Final payment shall not relieve you of these obligations.

6. DELIVERY, STORAGE, AND HANDLING

- 6.1 Protect equipment during transit, storage, and handling to prevent damage, theft, soiling, and misalignment. Coordinate with the client for secure storage of equipment and materials. Do not store equipment where conditions fall outside manufacturer's recommendations for environmental conditions. Do not install damaged equipment; remove from site and replace damaged equipment with new equipment.

7. SEQUENCE AND SCHEDULING

- 7.1 Submit schedule for installation of equipment and cabling. Indicate delivery, installation, and testing for conformance to specific job completion dates. As a minimum, dates are to be provided for bid award, installation start date, completion of station cabling, completion of riser cabling, completion of testing and labeling, cutover, completion of the final punch list, start of demolition, owner acceptance, and demolition completion.

8. USE OF THE SITE

- 8.1 Access to building wherein the work is performed shall be as directed by the P.M. The client will occupy the premises during the entire period of construction for conducting his or her normal business operations. Cooperate with the client to minimize conflict and to facilitate the owner's operations.

Schedule necessary shutdowns of plant services with the main contractor, and obtain written permission from the client.

Proceed with the work without interfering with ordinary use of streets, aisles, passages, exits, and operations of the client.

PRODUCTS

1. MANUFACTURERS

Provide products of manufacturers as named in individual articles. Where no manufacturer is specified, provide products of manufacturers in compliance with requirements.

2. FABRICATION

Fabricate custom-made equipment with careful consideration given to aesthetic, technical, and functional aspects of equipment and its installation.

3. SUITABILITY

Provide products that are suitable for intended use, including, but not limited to environmental, regulatory, and electrical.

4. VOICE/DATA TELECOMMUNICATIONS SERVICE BACKBONE CABLE

a. Solid copper, 24 AWG, 100 Ω balanced twisted-pair (UTP) backbone cable, with mechanical and transmission performance specifications that meet or exceed ANSI/TIA/EIA-568-B.2

b. Multimode 62.5/125 μm diameter tight-buffered optical fiber, with fiber counts as indicated on drawings, with mechanical and transmission performance specifications that meet or exceed ANSI/TIA/EIA-568-B.3

5. VOICE TELECOMMUNICATIONS STATION CABLE

a. Solid copper, 24 AWG, 100 Ω balanced twisted-pair (UTP) Category 6A cables with four individually twisted-pairs, which meet or exceed the mechanical and transmission performance specifications in ANSI/TIA/EIA-568-B.2 up to 100 MHz.

6. DATA STATION CABLE (Copper)

a. Solid copper, 24 AWG, 100 Ω balanced twisted-pair (UTP) Category 6A cables with four individually twisted-pairs, which meet or exceed the mechanical and transmission performance specifications in ANSI/TIA/EIA-568-B.2 up to 100 MHz.

b. Solid copper, 24 AWG, 100 Ω balanced twisted-pair, screened (ScTP) cables with four individually twisted-pairs, which meet or exceed the mechanical and transmission performance specifications in ANSI/TIA/EIA-568-B.2 (Annex K) up to 100 MHz.

7. DATA STATION CABLE (Optical Fiber)

a. Multimode 62.5/125 μm diameter tight-buffered optical fiber, with the required number of fiber counts, with mechanical and transmission performance specifications that meet or exceed ANSI/TIA/EIA-568-B.3

8. UNDERGROUND TELECOMMUNICATIONS CABLE (Copper)

If you have copper cables installed outside between buildings, be certain to specify overvoltage protectors on both ends of the cable. See article, OVERVOLTAGE PROTECTORS.

Solid copper, 24 AWG 100 Ω balanced twisted-pair, gel-filled duct cable, in sizes as indicated on the drawings, which meet or exceed the mechanical and transmission performance specifications listed in ANSI/TIA/EIA-568-B.2 and ANSI/TIA/EIA-758(A).

9. UNDERGROUND TELECOMMUNICATIONS CABLE (Optical Fiber)

Singlemode 8.7 μm to 10 μm diameter, armored, gel-filled optical fiber, with number of usable fibers as shown on drawings, which meet or exceed the mechanical and transmission performance specifications listed in ANSI/TIA/EIA-568-B.3 and ANSI/TIA/EIA-758(A).

10. VOICE/DATA – COPPER & OPTICAL FIBER WORK AREA OUTLETS

Edit for items that will actually be used on the project.

Pick a color for the faceplate and each type of jack, or make them all one color.

Determine which pinning standard is to be used, T568A, T568B, or USOC. If not otherwise specified, specify T568A. Use either 10c with SC connectors or 10d (1) for ST connectors. SC connectors are preferred. Use ST connectors to match existing cable plant if required.

Single-gang mounting plate with two (2) openings containing the following devices:

- a. Data Outlet - 8-pin modular, category 6A, unkeyed, black, pinned to either T568 (A or B) standards.

- b. Optical Fiber Connectors – simplex ST - ST adapter.
Provide two optical fiber adapters for each faceplate

11. VOICE/DATA WORK AREA OUTLETS (Copper only)

Single-gang mounting plate with four (4) openings containing the following devices:
Data Outlet - 8-pin modular, Category 6A, unkeyed, black, pinned to either T568 (A or B) standards.

12. VOICE ONLY WORK AREA OUTLET

Single-gang faceplate with 8-pin modular, category 6A, unkeyed, ivory telephone jack, pinned to either T568 (A or B) standards

13. TERMINATION BLOCKS

For items that will actually be used on the project: Coordinate with MC, IC and HC layout drawing.

- a. Product(s) as approved by the P.M: Wiring blocks are to be in following configurations:

- 1) List dimensional configurations
- 2) ER – List pairs categorized for PABX portion of ER and pairs field terminated for backbone and CO portion of ER

Provide wiring troughs between ER frame sections.

14. PATCH PANELS

Specification Note: Alter quantities to match job requirements.

19 in. rack mountable, 24-port 8-pin modular to insulation displacement connector (IDC) meeting Category 6A performance standards, and pinned to either T568 (A or B) standards. Typical examples of IDC connections are the 110, BIX, and Krone.

15. WALL MOUNTED OPTICAL FIBER PATCH PANELS

Specification Note: Alter quantities to match job requirements

Wall-mounted optical fiber termination panel with 12-fiber capacity, hinged door, cable strain relief, slack storage, and two 6-port SC or approved alternative connector panels with adapters and provisions for two splice trays.

16. RACK MOUNTED OPTICAL FIBER TERMINATION PANEL

Specification Note: Alter size to match job requirements. Coordinate with connector type.

19 in. rack mounted 72-port rack-mounted optical fiber termination panel with cable strain relief, grounding lugs, slack storage and three 12-port duplex SC or approved alternative connector panels with adapters and provisions for six (6) splice trays.

17. SPLICE TRAYS

Sized for single mode and multimode fibers, nonmetallic with clear plastic cover, 12-fiber splice capacity, compatible with splice enclosure and splicing method.

18. OPTICAL FIBER CONNECTORS

Ceramic tipped field installed 568SC connectors, which meet or exceed the performance specifications in ANSI/TIA/EIA-568-B.3. Various alternative field installed connector designs, which meet or exceed the performance specifications in ANSI/TIA/EIA-568-B.3 (Annex A).

19. OPTICAL FIBER JUMPERS

Dual 62.5/125- μ m (*and/or single mode*) optical fiber jumper cable, 1 m long with 3.0 mm Duplex 568SC optical fiber connectors on each end.

Dual 62.5/125- μ m (*and/or single mode*) optical fiber jumper cable, 1 m long with approved alternative duplex optical fiber connectors on each end.

20. OPTICAL FIBER PIGTAILS

62.5/125 μ m (*and/or single mode*) optical fiber pigtail 1 m long with 3.0 mm single 568 SC optical fiber connectors on one end

21. OPEN FRAME EQUIPMENT RACK

Open frame, 19 in. equipment rack, 7 foot 6 in. overall height with flange base, mounting rails drilled front and back and tapped to EIA standards, and a front-rack mountable 10 outlet multiple outlet electrical strip or 42u enclosed glazed.

22. EQUIPMENT RACKS/CABINETS

Specification Note: Use 19 in. or change to 23 in. as required. If using wall-mounted racks or cabinets, add required specifications here. Add and delete features as required.

a. The 19 in. equipment rack shall have the following minimum requirements:

- 77 in. (44 rack spaces) of panel space
- Welded frame construction
- Locking front and rear doors
- Adjustable front and back equipment mounting rails drilled and tapped to EIA standards
- 10 position electrical outlet strip
- Removable side panels
- Top mounted, thermostatically controlled exhaust fan
- Smoked acrylic front door.

23. LISTED BUILDING ENTRANCE PROTECTORS

Use when copper cables are run outside of building.

Use appropriate protector modules.

Building entrance terminal utilizing a two (2) foot fuse link between the outside cable plant splice and the protector module with IDC type input and output terminals, 100-pair capacity and female mounting base, equipped with 230-volt solid state protector modules. Provide sufficient protector modules to completely populate all building entrance terminals.

24. SPLICE HOUSING

Use this or something else. Delete splice modules if used for optical fiber cables.

- a. Encapsulated, re-enterable splice housing, sized as required with bonding straps, accessories, end caps and encapsulant as required
- b. Splice modules (such as 710 series or MS²) for use within splice housing

25. SPARES

Change quantities to suit job size. Edit to match that which is actually specified.

a. Furnish the following spare equipment and parts:

Terminal block connectors, if required

Test set cords, if required

Install one test cord set in each telecommunications closet

Five (5) percent of base bid quantity of each type of jack shall be provided

Five (5) percent of base bid quantity of each type of outlet

Five thousand (5000) ft of each type of station cable

One thousand (1000) ft of one-pair cross-connect wire for each telecommunications closet

One thousand (1000) ft of two-pair cross-connect wire for each telecommunications closet

Five (5) percent of base bid quantity of protector modules

EXECUTION

1. PRE-INSTALLATION SITE SURVEY

- a. Prior to start of systems installation, meet at the project site with the P.M and representatives of trades performing related work to coordinate efforts. Review areas of potential interference and resolve conflicts before proceeding with the work. Facilitation with the Client will be necessary to plan the crucial scheduled completions of the equipment room and telecommunications closets.
- b. Examine areas and conditions under which the system is to be installed. Do not proceed with the work until satisfactory conditions have been achieved.

2. HANDLING AND PROTECTION OF EQUIPMENT AND MATERIALS

- a. Be responsible for safekeeping of your own, such as equipment and materials, on the job site. The client assumes no responsibility for protection of above named property against fire, theft, and environmental conditions.

3. PROTECTION OF OWNER'S FACILITIES

- a. Effectively protect the client's facilities, equipment, and materials from dust, dirt, and damage during construction.
- b. Remove protection at completion of the work.

4. INSTALLATION

Receive, check, unload, handle, store, and adequately protect equipment and materials to be installed as part of the contract. Store in areas as directed by the owner's representative. Include delivery, unloading, setting in place, fastening to walls, floors, ceilings, or other structures where required, interconnecting wiring of system components, equipment alignment and adjustment, and other related work whether or not expressly defined herein.

Install materials and equipment in accordance with applicable standards, codes, requirements, and recommendations of national, state, and local authorities having jurisdiction, and *National Electrical Code*® (NEC) and with manufacturer's printed instructions.

Adhere to manufacturer's published specifications for pulling tension, minimum bend radii, and sidewall pressure when installing cables.

- 1) Where manufacturer does not provide bending radii information, minimum-bending radius shall be 15 times cable diameter. Arrange and mount equipment and materials in a manner acceptable to the P.M and the client.
- e. Penetrations through floor and fire-rated walls shall utilize intermediate metallic conduit (IMC) or galvanized rigid conduit (GRC) sleeves and shall be fire stopped after installation and testing, utilizing a fire stopping assembly approved for that application.
 - f. Install station cabling to the nearest telecommunications room (TR), unless otherwise noted.
 - g. Installation shall conform to the following basic guidelines:
 - 1) Use of approved wire, cable, and wiring devices
 - 2) Neat and uncluttered wire termination
 - h. Attach cables to permanent structure with suitable attachments at intervals of 1200-1500mm. Support cables installed above removable ceilings.

- i. Install adequate support structures for 10 foot of service slack at each TR.
- j. Support riser cables every floor and at top of run with cable grips.
 - 1) Limit number of four-pair data riser cables per grip to fifty (50)
- k. Install cables in one continuous piece. Splices shall not be allowed except as indicated on the drawings or noted below:
- l. Provide over voltage protection on both ends of cabling exposed to lightning or accidental contact with power conductors.

Specification Note: *Insert any other specific installation requirements here, such as hook and latch fasteners instead of cable ties, etc.*

5. GROUNDING

- a. Grounding shall conform to ANSI/TIA/EIA 607(A) - *Commercial Building Grounding and Bonding Requirements for Telecommunications, National Electrical Code®*, ANSI/NECA/BICSI-568 and manufacturer's grounding requirements as minimum.
- b. Bond and ground equipment racks, housings, messenger cables, and raceways.
- c. Connect cabinets, racks, and frames to single-point ground which is connected to building ground system via #6 AWG green insulated copper grounding conductor.

6. LABELING

Use 6d if the type of termination block permits labels. Otherwise use 6e.
Use 6g if the owner does not have a standard for outlet numbering.
Use 6h if required. Alter time as requested.

Labeling shall conform to ANSI/TIA/EIA-606(A) standards. In addition, provide the following:

- a. Label each outlet with permanent self-adhesive label with minimum 3/16 in. high characters.
- b. Label each cable with permanent self-adhesive label with minimum, 1/8 in. high characters, in the following locations:
 - 1) Inside receptacle box at the work area.
 - 2) Behind the communication closet patch panel or punch block.
- c. Use labels on face of data patch panels. Provide facility assignment records in a protective cover at each telecommunications closet location that is specific to the facilities terminated therein.
- d. Use color-coded labels for each termination field that conforms to ANSI/TIA/EIA-606(A) standard color codes for termination blocks.
- e. Mount termination blocks on color-coded backboards.
- f. Labels shall be machine-printed. Hand-lettered labels shall not be acceptable.

g. Label cables, outlets, patch panels, and punch blocks with room number in which outlet is located, followed by a single letter suffix to indicate particular outlet within room, i.e., S2107A, S2107B. Indicate riser cables by an R then pair or cable number.

h. Mark up floor plans showing outlet locations, type, and cable marking of cables. Turn these drawings over to the owner two (2) weeks prior to move in to allow the owner's personnel to connect and test owner-provided equipment in a timely fashion.

i. Three (3) sets of as-built drawing shall be delivered to the owner within four (4) weeks of acceptance of project by the owner. A set of as-built drawings shall be provided to the owner in magnetic media form (3.5" floppy disks) and utilizing CAD software that is acceptable to the owner. The magnetic media shall be delivered to the owner within six (6) weeks of acceptance of project by owner.

7. TESTING

Testing shall conform to ANSI/TIA/EIA-568-B.1 standard. Testing shall be accomplished using level IIe or higher field testers.

Test each pair and shield of each cable for opens, shorts, grounds, and pair reversal. Correct grounded, and reversed pairs. Examine open and shorted pairs to determine if problem is caused by improper termination. If termination is proper, tag bad pairs at both ends and note on termination sheets.

- 1) Perform testing of copper cables with tester meeting ANSI/TIA/EIA-568-B.1 requirements.
- 2) If copper backbone cable contains more than one (1) percent bad pairs, remove and replace entire cable.
Use 2 or 3 as required.

3) If copper cables contain more than the following quantity of bad pairs, or if outer sheath damage is cause of bad pairs, remove and replace the entire cable:

CABLE SIZE	MAXIMUM BAD PAIRS
<100	1
101 to 300	1 – 3
301 to 600	3 – 6
>601	6

- 4) If horizontal cable contains bad conductors or shield, remove and replace cable. Initially test optical cable with a light source and power meter utilizing procedures as stated in ANSI/TIA/EIA-526-14A: *OFSTP-14A Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant* and ANSI/TIA/EIA-526-7 *Measurement of Optical Power Loss of Installed Single mode Fiber Cable Plant*. Measured results shall be plus/minus 1 dB of submitted loss budget calculations. If loss figures are outside this range, test cable with optical time domain reflectometer to determine cause of variation. Correct improper splices and replace damaged cables at no charge to the owner.
 - 1) Cables shall be tested at 850 and 1300 nm for multimode optical fiber cables.
Cables shall be tested at 1310 and 1550 nm for single mode optical fibers.
 - 2) Testing procedures shall utilize "Method B" – One jumper reference.
 - 3) Bi-directional testing of optical fibers is required.

- d. Perform optical time domain reflectometer (OTDR) testing on each fiber optic conductor. Measured results shall be plus/minus 1 dB of submitted loss budget calculations.
 - 1) Submit printout for each cable tested.
 - 2) Submit 3.5 in. disks with test results and program to view results.
- e. Where any portion of system does not meet the specifications, correct deviation and repeat applicable testing at no additional cost.

FIELD QUALITY CONTROL

- a. Employ job superintendent during the course of the installation to provide coordination of work of this specification and of other trades, and provide technical information when requested by other trades. This person shall maintain current RCDD® (Registered Communications Distribution Designer) registration and shall be responsible for quality control during installation, equipment set-up, and testing.
- b. At least 30 percent of installation personnel shall be *BICSI Registered Telecommunications Installers*. Of that number, at least 15 percent shall be registered at the *Technician Level*, at least 40 percent shall be registered at the *Installer Level 2*, and the balance shall be registered at the *Installer Level 1*.
Specification Note: Use this or insert manufacturer's requirements for installer qualifications to meet extended warranty program requirements.
- c. Installation personnel shall meet manufacturer's training and education requirements for implementation of extended warranty program.

B. PARTICULAR SPECIFICATIONS FOR STRUCTURED CABLING WORKS

1.0 SITE LOCATION

The site of the proposed works is located **at Karatina University, Nyeri County.**

2.0 DESCRIPTION OF THE PROJECT

The works to be carried out comprise the following;

- i) Proposed supply, installation, testing and commissioning of a structured cabling system to cater for computer data points and telephone points.
- ii) Configure and set up the structured cabling system to be used on LAN,
- iii) Produce test result, warranty certification, reports and as installed drawings. The Network will be capable of supporting approximately 120 data/voice points.
- iv) Supply, install telephone cables to interconnect the data cabinets to the IP-PABX to be located in the Server Room. The works shall include inter-wiring, programming and activating all voice points.

3.0 REGULATIONS

The contractor shall, in execution and completion of the works in the detailed design for which he is responsible, comply with the provisions of the following as necessary and relevant;

- a) ISO/IEC, CAK, ATM CENELEC 11801
- b) ANSI/EIA/TIA 56
- c) Latest Edition of IEE Regulation
- d) Kenya Bureau of Standards
- e) Electric Power Act and Rules made there under.

4.0 WORKING DRAWINGS

The Contractor shall submit to the Project Manager working drawings for the proposed system for approval. The drawings will show the locations of and identifiers for all cable routing and terminations, telecommunication outlets/connectors. Location of core switch and Edge switches.

5.0 NETWORK CABINETS

- a) To be located on each floor in designated rooms as indicated in the electrical drawings.
- b) Must be metallic (appropriately sized as specified in the BQ) with a front clear glass, freestanding, complete with lock and key and the following accessories;
 - Cable Management channel rack
 - Cable support hooks
 - Cable support rings and straps
 - Cable duct cover
 - Feed through cable panels
 - Vented equipment shelving
 - Blank filler panels
 - Hinged wall mounted brackets
 - Glass viewing window
 - Colored Designation strips
 - Management lock and key
 - Cooling extractor fans
 - Caster wheels
 - Inbuilt 2-gang power socket outlet

6.0 ACTIVE CONTROL EQUIPMENTS AT THE NETWORK CORE

The active control equipment at the core should have the following features:

Technical Specifications	Requirement
LAN Interface Modules	16 SFP+
Chassis	
Chassis Slots	4
Fixed Slots (for Control Modules)	1
Open Slots (for Port Modules)	3
Max. Switching Capacity	500 Gbps
Max. Packet Forwarding Rate	400 Mbps
Maximum Port Density	
10/100/1000Base-T Ports	144
10/100/1000Base-T Ports with PoE	144
Gigabit SFP Slots	144
10-Gigabit SFP+ Slots	48
Dimensions	≤ 8U
Operating Temperature	0° to 50°C
Operating Humidity	10% to 90% RH
L2 Features	
MAC Address Table	32K per I/O module
Flow Control	-802.3x Flow Control -HOL Blocking Prevention
IGMP Snooping	-IGMP v1/v2/v3 Snooping -Support 2K groups -IGMP Proxy2 -Host-based IGMP Snooping Fast Leave
802.3ad Link Aggregation	-Compliant with 802.1AX and 802.3ad -Max. 128 groups per device, 8 ports per group -Support cross-module trunk
power supply	The core switch should have redundant power supply, redundant fan tray and redundant CPU/ supervisor engine installed

7.0 ACTIVE CONTROL EQUIPMENTS AT THE LAN EDGE

Active control equipment at the LAN Edge should have the following features

- a) Active control equipment at the LAN Edge should support 10/100/1000 MBPS on all ports (RJ45) and Gigabit to the desktop connectivity
- b) The equipment should have at least two 1000BaseXGigabit uplink ports for terminating backbone Fiber.
- c) The equipment should support layer 3 routing.
- d) Should support IEEE 802.1, SSH, SNMP.
- e) IEEE 802.3 compliant for power over Ethernet
- f) Switch Fabric forwarding Bandwidth of 64GBPS or more.
- g) More than 12,000MAC addresses should be available on each switch.
- h) The switches should have 24/48 ports of 10/100/1000 MBPS.
- i) Each stack on the edge will have two links of Fiber to the core switch, totaling two fiber terminations from the core switch to the stack.
- j) Should support Jumbo frames.
- k) Total stack throughput bandwidth of 64 GBPS or more.
- l) Integrated wireless access points controller
- m) Active equipment at the LAN Edge should be quoted with a minimum of **One year of warranty** covering free replacement of parts and units.

8.0 NTU Specifications

Type:	HDSL
Max Data Transfer Rate:	2Mbps
Mode of Operation:	DCE
Connector:	DB37
Interface Cable:	DB37-DB15

9.0 NETWORK MANAGEMENT SYSTEM

Bidders must propose the manufacturers Network Management system for centralized configuration, maintenance and troubleshooting of active equipment. Third party standalone systems should not be offered as part of the solution. Features and functionalities of the system should include the following:

- a) Should be compatible with Microsoft windows/Linux operating systems
- b) Graphical User Interface for central Management and network viewing
- c) Network discovery and inventory management
- d) VLAN, multicast, security and load-balancing/fail over configuration
- e) Downloading and saving of log file from the device flash memory
- f) Centralized upgrade/backup and archiving of active devices
- g) Export of network topology to JPEG or other standard formats.

10.0 CABLES

10.1) UTP CABLE

The UTP cable must be category 6A compliant UTP cable, with the following specifications;

- a) 4-pair cables with 100-ohm impedance.
- b) Compliant to standards such as TIA/EIA – 268-B. 2-1 and IEC 61156-5
- c) Made of polyethylene insulation
- d) Pulling force should support up to 50N/mm²
- e) Low Smoke Zero Halogen outer sheath

10.2) OPTICAL FIBRE CABLE

The fibre cable must be 8 core multimode fibre with the following specifications: -

- a) Cable size: 8 core.
- b) Termination: SC Duplex connectors.
- c) Graded Index: Nominal 62.5/125 micro. m

11.0 CAT 6A PATCH PANELS

The Contractor shall provide factory made patch panels, Cat 6A complete with cable management and front designation strips, 110 PCB mounted connectors and integral RJ mounted jack sockets.

12.0 FIBER PATCH PANELS

All Backbone Fiber links to individual floors should be terminated on Fiber Patch Panels. Connector interfaces should support ST, Sc simplex, Sc duplex, FC, LC or MT-RJ.

13.0 BACK BONE

Backbone cabling inclusive of switches and all necessary accessories shall be carried out in readiness for the termination of edge switches.

The Backbone cabling shall be flexible and allow for easy 'add on's' for future expansions. Hence enough capacity shall be allowed for future expansion.

15.0 COMPLETION COMMISSIONING OF STRUCTURED CABLING WORKS

15.1 Upon completion of the installation, all cabling links must be tested for the following parameters, using Level Three testers: -

a) Category 6A Cable Tests

1. Wire Map
2. Length
3. Insertion Loss (Attenuation)
4. NEXT Loss
5. PSNEXT Loss
6. ELFEXT Loss, pair-to-pair
7. PSELFEXT Loss
8. Return Loss
9. ACR (Attenuation to crosstalk ratio)
10. PSACR
11. Propagation Delay
12. Delay Skew

b) Fibre Optic Cable Tests

1. Link attenuation (insertion loss)
2. Length

Any failing link must be diagnosed and corrected. The corrective action shall be followed with a new test to prove that the corrected link meets the performance requirements.

The results should be recorded in one or several measure books showing test results of the cable components. In addition, the measurements must be recorded on two soft copies (CD-ROM).

15.2 All components must be tested and a Completion Certificate issued stating the following:

- a. Number of outlets
- b. Type of cable
- c. Date completed
- d. Type of Warranty

In addition, an "as-built" package must be submitted with the following information

- a. Updated floor plans
- b. Wire/cable routing schematic
- c. Facility assignment records
- d. Horizontal cable test results
- e. Fibre Backbone test results

16.0 Documentation

The contractor shall avail documentation (2 copies) detailing the layout and devices or components of the system and must include all information for maintenance technicians to run, service, extend or maintain the network. In particular, the documentation must be structured and contain the following:

- a. Synopsis of the cabling (primary and secondary)
- b. Charts of the distribution highlighting the details of the elements that have been installed
- c. Detailed map of socket layout (2 Soft copies on CD-ROM should be availed)
- d. Reports on measurements (2 Soft copies on CD-ROM should be availed)

The CD-ROMs provided shall include the software tools required to view, inspect and print any selection of test reports.

17.0 Warranty and Support

- 3.1 The Contractor will be required to give a per link warranty of at least fifteen (15) years for the structured cabling infrastructure and must provide a site certification certificate from the manufacturer of the cabling infrastructure not more than 30 days after completion of tests.
- 3.2 In the event of failure of the core switch, the contractor will be required to deliver any necessary parts on the next business day after determining that parts replacement is required, during the standard work week (8 hours a day, 5 days a week). This support will be carried out by a field engineer and will run for a period of Twenty Four months from the date of commissioning of the LAN.
- 3.3 The contractor will be required to provide a sixty months warranty on the edge switches from the date of commissioning of the LAN.

18.0 ADDITIONAL NOTES

Tenderers should take note of the following

- a) The network should be capable of carrying data, voice and video. QOS should be considered as part of installation and configuration of the network.
- b) All active LAN equipment should be from the same manufacturer for seamless integration, management and maintenance.
- c) Each floor should have a telecommunication Closet to house the necessary structured cabling components and active equipment.

19.0 BROCHURES AND TECHNICAL LITERATURE

Tenderers **must** enclose together with their submitted bids brochures detailing technical Literature and specifications of the active components of the structured cabling system. The brochures shall be used to evaluate the suitability of these components.

Any bid submitted without the brochures shall be considered technically non-responsive, and may subsequently be disqualified.

PARTICULAR AND TECHNICAL SPECIFICATIONS – IP-PABX EQUIPMENT

1.01 DESCRIPTION OF THE SITE

The site of the proposed works is located at **Karatina University, Nyeri County**.

1.02 DESCRIPTION OF THE PROJECT

The works comprise the Installation, Testing and Commissioning of existing IP-PABX Equipment, Supply, Installation and Testing of new Telephone Instruments and the associated cabling works as listed in the Bills of Quantities.

1.03 CLIMATIC CONDITIONS

The following climatic conditions apply at the site of the Contract Works and the equipment, materials and installations shall be suitable for these conditions:

Altitude	1798M above Sea level
Mean Maximum Temperature	28.7°C
Mean Minimum Temperature	12.8°C
Range of Relative Humidity	48%-93%
Salt in the atmosphere	0.02%
Mean Rainfall	897mm

Extremely heavy rainfall is experienced at certain periods of the year and the contractor shall be deemed to have taken account of this factor both in his prices and his planning of the execution of the contract works.

Equipment de-rating factors for the temperature and altitude shall be stated.

1.04 BOND FOR PABX WITH PROVISIONAL TYPE APPROVAL

Where the IP-PABX offered for this tender does not possess full type approval from C.A.K but has provisional type approval, the tenderer will be required to submit the name of a separate surety who will be willing to be bound to the Kenya Government in an amount equal to the full value of the PABX project for a period of 18 months from the date the IP-PABX is commissioned into service. The surety will be subject to the approval of the government.

1.05 REGULATIONS

The contractor shall, in the execution and completion of the works in the detailed design for which he is responsible comply with the provisions of the following as necessary and relevant:

- Communication Authority of Kenya (*formerly CCK*)
- The Kenya Communications Act
- The Electronic Power Act and the Rules made there under.
- The Kenya Power and Lighting Company Limited's Bye-Laws.
- The current edition of the "Regulations for the Electric Equipment of Buildings" issued by the Institution of Electrical Engineers.
- The requirements of the Chief Inspector of Factories for the Kenya Government.
- Kenya Bureau of Standards (KEBS) Standard Specifications and Codes of Practice, or other equal and approved standard specifications and codes.
- The Bye-Laws of the Local Authority.

- Any other regulations applicable to Electric and Electronic Installations or Communications systems in Kenya.
- The Employer's Safety Regulations.

1.06 POSITION OF SERVICES AND EQUIPMENT

The route services and approximate positions of apparatus are shown on the contract drawings but their exact positions shall be determined by approved dimensional details on working drawings or on site by the P.M.

The contractor shall ascertain on site that his work will not foil other services or furniture and all services through the ducts must be readily accessible for maintenance and arranged to allow maximum access along the ducts. Any work which has to be redone due to negligence in this respect will be the contractor's responsibility.

1.07 SETTING TO WORK AND REGULATING SYSTEMS

The contractor shall carry out such tests of the contract works as are required by KEBS Standard Specifications and Codes of Practice, I.E.E Regulations or equal and approved codes, or the competent Authority.

No testing or commissioning shall be under taken except in the presence of and to the satisfaction of the P.M. unless approved otherwise by him (contractor's own preliminary and proving tests are exempted).

The contractor shall include in his tender for the costs for testing and commissioning the contract works as herein described. He shall submit for approval to the P.M. a suitable programme for testing and commissioning. The P.M. and the Employer shall be given ample warning as to the dates on which testing and commissioning will take place.

The proving of any system of plant or equipment as to compliance with the specification shall not be approved by the P.M. except at his discretion until tests have been carried out under operating conditions appertaining to the most onerous conditions specified except where the time taken to obtain such conditions is unreasonable or exceeds 12 months after practical completion of the contract works.

1.08 IDENTIFICATION OF PLANT AND COMPONENTS

The contractor shall supply and install identification labels to all plant and to all switches and items of control equipment with, where no excessive heating is involved, white Traffolyte or equal labels engraved in block lettering denoting the name/function and/or section controlled. Where heating is likely to distort Traffolyte, approved aluminum labels with stamped or engraved lettering shall be used.

The labels shall be mounted on equipment and in most suitable positions. They shall be in English or in internationally understood symbols capable of being read without difficulty. The labels shall conform to descriptions used on record drawing. Details of the lettering of the labels and the method of mounts or supporting shall be forwarded to the P.M. for approval prior to manufacture.

1.09 WORKING DRAWINGS

The contractor shall prepare such working Drawings as may be necessary. The working Drawings shall be completed in such details not only that the contract works can be executed on site but also that the P.M can approve the contractor's designs and intentions in execution of the contract works.

Approved working drawings shall not be departed from except where provided for. Approval by the P.M. of working Drawings shall neither relieve the contractor of any of his obligations under the contract nor relieve him from correcting any errors found subsequently in the approved working Drawings or elsewhere associated therewith or with the works.

1.10 RECORD DRAWINGS

During the execution of works on site the contractor shall, in a manner approved by the P.M. record on working or other Drawings at site all information necessary for preparing Record Drawings of the installed contract Works. Marked-up working or other Drawings and other documents shall be made available to the P.M. as he may require for inspection and checking.

Record Drawing shall include but are not restricted to the following drawings or information: -

- Working Drawings amended as necessary but titled “Record Drawings” and certified as a true record of the as installed” contract works.
- Fully dimensioned drawings of all plant and apparatus.
- System Schematic and trunking diagrams showing all salient information relating to control and instrumentation.
- Wiring diagrams of individual plant, apparatus and switch and control boards.
These diagrams to include these particular to individual plant or apparatus and elsewhere applicable those applicable to system operation as a whole.

One reproducible copy of the Record Drawings of the contract works and Schematic Diagrams shall be provided not later than one month afterwards.

Notwithstanding the contractor’s obligation referred to above, if the contractor fails to produce to the P.M.’s approval of the Record Drawings, within one month of partial or Practical Completion the Employer shall be at liberty to have these drawings produced by others. The cost of obtaining the necessary information shall be deducted from the out-standing payments due to the contractor.

1.11 TESTS

Both on completion of his work and at the end of the guarantee period the contractor shall carry out such tests as may be required in the presence of the P.M. or his representative, or the competent Authority and shall provide all necessary Instruments, labour and materials to do so. The Contractor shall pay such charges related to such tests if any.

1.12 QUALITY OF MATERIALS

Materials and apparatus required for the complete installation as called for in the specifications or Contract Drawings shall be supplied by the contractor unless specified otherwise.

Unless otherwise specified all materials (including equipment, fittings, cables) shall be new, of the best quality and approved origin.

1.13. TRAINING

In the direction and to the satisfaction of the P.M. the contractor shall arrange for the training of the attendant console operators, users and the administrators at the site or the contractor’s office on the workings of the IP-PABX. The cost of such training shall be included in the contractor’s prices.

1.14 EQUIPMENT GUARANTEE

The contractor shall undertake in writing to rectify free of charge, all faults arising from faulty components, materials, design or workmanship by the manufacturer or contractor whichever is applicable. This liability shall be for a minimum period of one calendar year from the date of acceptance of the equipment. Twelve months limitation notwithstanding, the period of liability shall not end until all defects which appear during the liability period have been rectified.

1.15 PATENT RIGHTS

The contractor shall fully indemnify the Government of Kenya, against any action, claim or proceeding relating to infringement of any patent or design rights, and shall pay any royalties which may be payable in respect of any article or any part thereof which shall have been supplied by the contractor to the P.M. and in like manner the government of Kenya shall fully indemnify the contractor against any such action, claim or proceeding for infringement or alleged infringement under the works the design thereof which shall have been supplied by the P.M. to the contractor, but this indemnity shall apply to the works only, and any permission or request to manufacture to the order of the P.M. shall not relieve the contractor from liability should he manufacture for, or supply to other buyers.

2.00 TECHNICAL SPECIFICATIONS

2.01 SCOPE OF THE WORKS

The contractor shall supply, deliver, unloaded, test, commission, and guarantee and be liable for defects, and be responsible for the initial maintenance, all as specified herein, of the new Telephone Instruments and accessories and all its associated cabling. The existing IP-PABX is entirely IP, ISDN native and with time multiplexing architecture.

The contractor shall supply and install associated items of plant and equipment other than those clearly stated to be supplied by others. He shall supply and install all accessories, whether described in the specification or not, essential to the completion of the works to the satisfaction of the P.M.

All equipment supplied shall be type approved by CAK and the installation shall be approved by the Communications Commission of Kenya (the competent Authority). The tenderer shall be responsible for all negotiations with and payments to the commission. He shall also pay all fees.

2.02 MINIMUM REQUIREMENTS

This specification defines minimum requirements, but bidders who offer superior facilities will be considered. Any tender that does not comply with the minimum requirements will be rejected.

2.03 EQUIPMENT FINISH

The equipment finish shall be the responsibility of the contractor, who shall be responsible for its protection during erection and in the course of making good to the building finishes after equipment erection.

2.04 INTERFERENCE SUPPRESSION

The equipment and all its accessories shall be suppressed so as not to interfere with any communications, radio, T.V., Security or electro-medical equipment, recording or computer systems.

2.05 DOOR KEYS

The contractor shall keep the PABX suite locked at all times when his staff are not present and shall at the conclusion of the contract hand over all keys to the P.M.

2.06 EQUIPMENT HARDWARE

The tenderer shall quote for a multimedia application **fully IP-PABX**. The equipment must be 4U Industrial Grade Rack mountable Server, 4GB RAM, 500GB HDD, Core 2 Duo Processor configuration with duplicated components so that the PABX service will not be lost due to failure of a single component. The components to be duplicated should but not limited to:

- Power Supply Modules
- Main Control card
- Hard disc drives
- Memory storage expansion card

2.07 EQUIPMENT SOFTWARE

The equipment shall be preloaded with core software for driving it and giving it full operating flexibility. The list of features and services should be comprehensive and extensive and comprising the following:

- System features
- Operator features
- Standard telephone features
- Executive telephone features
- System administration features
- IP Network features
- Data features
- Special applications features

2.08 SYSTEM FEATURES

The system features shall include but not limited to the following facilities:

- Automated Attendant
- Black List
- Blind transfer
- Call Details Record.
- Call Forward on No Answer
- Call Forward Variable
- Call Monitoring
- Call Parking
- Call Queuing
- Call Recording
- Call Retrieval
- Call Routing (DID & ANI)
- Call Snooping
- Call Transfer Call Waiting
- Caller ID
- Caller ID on Call Waiting
- Database Store / Retrieve
- Database Integration
- Dial by Name
- Direct Inward System Access
- Distinctive Ring
- Distributed Universal Number Discovery (DUNDi™)
- Do Not Disturb
- Fax Transmit and Receive
- Music On Transfer
- Flexible Extension Logic
- Interactive Directory Listing
- Interactive Voice Response (IVR)
- Local and Remote Call Agents
- Music On Hold

- Caller ID Blocking
- Conference Bridging

2.09 WEB BASED COMPANY RECEPTIONIST (CALL QUEUE AND IVR (INTERACTIVE VOICE RESPONSE

- Calls in queue, pick which calls to answer.
- Active Calls Show the list of active calls and engaged extensions.
- Availability, IP Phone/soft phone status like off-hook, on-hook, ringing.
- Call Park.
- Drag and Drop call transfer.
- Voicemail transfer.
- Call Toggle – Allows the operator to shift between calls
- Music on Hold per queue.
- Caller Experience – Let the caller hear the phone ring instead of listening to music on hold.
- Ringing Options – Ring All, Round Robin, Fewest Calls, Least Recently Called, Random, and In Order.
- Extension Dialing – Allow the callers to dial an extension at any time.
- Send to Voice Mail.

2.10 CALL CONTROL

- Call Transfer – you can easily transfer incoming calls or active calls to another extension. Set the transfer rules for incoming calls so you can check the call list, then transfer, transfer without checking, or send the call straight to voicemail.
- Call Pick up – You can set up Call Pickup groups so some employees can pick up calls ringing on other extensions by dialing a short code on their own phones. You determine who has this permission and which calls they can pick up.
- Do not disturb.
- Hold – Put a call on Hold using the button on your IP phone, or from the Switchboard. You can customize the Music on Hold that plays until you resume the call.
- Call Parking – Put a call on Hold using the button on your IP phone, or from the Switchboard. You can customize the Music on Hold that plays until you resume the call.
- Parallel Ringing.
- Follow me.

2.11 VOICE MAIL & VOICE MAIL TO E-MAIL

- Voice Mail Set up.
- Voice Mail Access.
- Voice mail to email or to any email client.

2.12 VOICE RECORDING

Automatically record calls coming in, going out, or even internally, based on the settings you define.

2.13 CONFERENCING

1. 3 Way conferencing from the IP Phone.
2. Meet me conference- With a Meet Me Conference Center, each of your phone extensions can have its own conference room.
3. Dial-in Conference.
4. Dial-out Conference

2.14 FAXING

1. Outgoing Fax.
2. Incoming Fax.

2.15 DISTRIBUTED OFFICE SETUP

Connects Multiple Offices through MPLS or VPN. Branch offices can be added to the IP server through an INTERNET connection.

2.16 PAGING/PAS

Dial a code to connect to a separate overhead paging and announcement system.

Dial a code and connect directly to a built-in one-way announcement speaker on one or more phones.

2.17 MULTI TRUNKING

Connect with PRI ISDN E1, T1. with Analog/PSTN/CO Lines. Connect with GSM Trunk.

2.18 SIP TRUNKING

- Ready to use the sip-trunking and as well the SIP Client
- Create Multiple VOIP accounts.

2.19 CALL ROUTING

- Location Based routing.
- Skill Based routing.
- DID Based Routing.

2.20 BARGE IN & LISTEN

Barge in: Barge in on both channels. The manager channel is joined onto the spied-on and bridged channel, and all parties can hear each other.

Listen: Monitor an agents call/ Extensions. The manager can hear both the spied-on and bridged channels, but they cannot hear the manager.

2.21 WHISPER

Whisper to the agent. The manager can hear both the spied-on and bridged channels, and the spied-on channel (agent) can also hear the manager, but not the bridged channel, hence “whisper.”

2.22 REPORTS

Complete report on day to day, weekly reports, Monthly report, Extension wise report,

2.23 THIRD PARTY INTEGRATION

Connects any 3 party Integration Like, CRM.
ERP.
SMS.
Click to Call.

2.24 MULTI PHONES CONNECTIVITY

Connect with different Phones Like: IP PHONE.
Analog Phone
Soft Phone
Smart Phone (Mobiles).
DECT phones

2.25 ATTENDANT CONSOLE (PC Based)

One or more PC operator attendant consoles as indicated in the list of main requirements shall be supplied, together with two operators' handsets and two operators lightweight headsets per position. They shall be installed complete with suitable UPS and any other accessories necessary to complete their installation. Each console shall be equipped with all necessary facilities for controlling, connecting and monitoring the progress of calls and shall display alarms as necessary.

Night service facilities will normally be provided such that the operator can route in-coming calls to pre-selected extensions when the console is not manned.

Attendant consoles will be multiplex so that the connecting cable will comprise a minimum number of pairs, with little restriction on the sitting of the consoles and positions shall be so common that any operator can attend to any call.

Call presentation, chaining process, call back will be entirely managed by the IP-PABX. However, it will be possible to put certain call on individual hold, on keys, which have been reserved to that effect.

The information displayed on the terminal will give maximum details about the communication (normal call, urgent call, queue status, internal called-party, status of the terminal etc.).

2.26 TELEPHONE INSTRUMENTS

The acquiring of telephone instruments has been liberalized. However, they must be Type-approved by the CAK and the tenderer must obtain the necessary approval.

a) EXECUTIVE IP TELEPHONE INSTRUMENTS

The executive telephone instruments shall be IP- type, keypad or touchpad dialing and shall have, but not limited to, the following operating characteristics: -

- Standard IP- telephone facilities
- Backlit touch, liquid crystal display (LCD) and embedded softkeys for efficient call handling and easy message management
- Feature buttons for quick access to frequently used functions such as hold, mute, do not disturb, transfer, forward, conference page and more
- Message waiting lamp, adjustable base and wall mount
- Includes full-duplex speakerphone and dedicated headset support
- Red light emitting diodes (LEDs) to indicate a call is active, ringing or holding
- QoS and web-based programming
- Upgradeable through software
- Supports G.711 a-law, G.711 u-law, G.729a, and G.729a/b vocoders
- Supports centralized power over LAN (local area network) (IEEE compatible)
- Enables dynamic host configuration protocol (DHCP) or static IP addressing
- User configurable transmission control protocol (TCP) and user datagram protocol (UDP) port number
- Network Port (10/100/1000 SW)
- Access Port (10/100/1000 PC)
- Configurable in SIP mode
- Supports VLAN tagging, which eases management, improves call quality and increases security

b) STANDARD IP TELEPHONE INSTRUMENTS

The standard level model design shall include:

- Backlit touch, liquid crystal display (LCD) and embedded softkeys for efficient call handling and easy message management
 - A minimum of 12 self-labeling programmable call/feature keys (but also be capable of supporting up to 24 if required);
 - Several fixed feature keys, including such popular features/functions as Speaker, Headset, Conference, Transfer, Redial, Mute, Drop, Hold (Color Highlighted), and Volume Up & Down;
 - An integrated full duplex speakerphone; an integrated large graphical backlit gray-scale display screen capable of supporting desktop productivity applications
 - Customer programmable self-labeled soft key
 - Network Port (10/100/1000 SW)
 - Access Port (10/100/1000 PC)
 - Embedded Web browser functionality
- Application keys, such as Call Log, Speed Dial and Web Browser; and hearing aid compatibility

2.27 NUMBERING SYSTEM

The numbering scheme will be:

Level 0 Access to PABX Telephone Operator

- “9 Access to the main exchange
- “8 Night service
- “7 Spare for future ISDN tie line access
- “6 ISDN - Tie line access
- “5 Spare for extensions
- “4 Extensions
- “3 Intercom
- “2 Extensions
- “1 Spare for special facilities.
- “10 plus code for feature de-activation.
- “11 plus code for feature activation.

2.28 EXCHANGE LINES

Exchange lines shall be arranged for first party release. The IP-PABX must be capable of processing the number of digits required for international calls in accordance with CCITT and CCIL recommendations.

A device shall be fitted to sense main exchange dial tone as there may be considerable delay in receiving this after the seizure of a free exchange line.

2.29 ISDN TIE LINES

The lines will provide access to all extensions and the operator. They are to be for auto-auto working through signaling and first party release. Tones are to be returned over to tie lines.

Disconnect loop signaling is at present employed with a maximum loop resistance of 2000 ohms.

2.30 SYSTEM MAINTENANCE

Test Equipment and Tools

PABX routine test set and a set of maintenance tools are to be supplied. The tools and spare parts are to be listed in Appendices “A” and “B” of the Bills of Quantities.

Maintenance Features

The IP-PABX shall have the following system maintenance features:

- Line status monitoring device
- Station message data recording port
- System Working report
- On site system administration using a compatible terminal and attendant console.
- Remote system administration capability
- Automatic on-line diagnostic testing

Maintenance diagnostic software programmes shall be provided which can be run as required whilst the IP-PABX is in normal service.

Maintenance and Operating Manuals

On practical completion of the works, the contractor shall furnish two sets of copies in soft copy and hard copy forms each of maintenance and operating manuals relating to the IP-PABX installed. The hard copy manuals shall be legibly written in English and properly bound with hard cover.

They will include but not limited to the following:

- System description
- Fault finding procedure
- Maintenance and servicing periods and procedures
- Schematic and wiring diagrams of the equipment
- Record drawings

2.31 POWER SUPPLY

Rectifier

The IP-PABX shall be fed through an integrated rectifier and an AC –DC converter fed from 240V A.C. 50Hz power supply. The rectifier will be equipped with the following devices:

- Security device to monitor the minimum and maximum authorized values of the output voltage. When one of the thresholds is reached, the power supply to the IP-PABX must cut itself automatically “Floating” and automatic “Equalization” device with manual command of the “Equalization” mode and automatic switch back to “floating” mode once the battery is loaded.

The rectifier will be sized to supply power to the IP-PABX and simultaneously allow re-loading of the battery within 10 Hours maximum.

Battery

A stationery battery is required to supply power during peak hours and mains supply failures and to provide smoothing for DC out put from the rectifier.

The battery shall be “Maintenance Free” and shall have sufficient capacity when fully charged to supply power to the IP -PABX in the event of mains supply failure for minimum of 8 hours. The

minimum DC out put shall be 48V DC +/- 10% and its life expectancy shall be 10 years. Automotive or Traction battery will not be accepted.

UPS

A UPS of suitable rating is required. It shall have a response time of NOT more than 0.1 seconds and a correction range from -12% to +12% with surge/spike protection.

Voltage Stabilizer

A voltage stabilizer of suitable rating is required. It shall have a response time of NOT more than 0.1 seconds and a correction range from -12% to +12% with surge/spike protection.

Earthing

An independent telecommunication earth shall be provided for the IP-PABX. The earth lead cable shall not be less than 6mm² and shall terminate to copper earth electrode(s) in a concrete manhole (300mm x 300mm) with a suitable concrete cover. The earth impedance shall not exceed 4 ohms.

2.32 LIST OF MAIN REQUIREMENTS FOR THE PROPOSED IP-PABX.

ITEM	FACILITY DESCRIPTION	INITIAL CAPACITY	ULTIMATE CAPACITY
1.	ISDN PRI-E1 of 30 Channels complete with a suitable Modem.	1No.	1No.
2.	No. of IP Extensions	50	100
3.	No. of Exchange Lines (Trunks)	8	12
4.	(i) GSM lines (Safaricom, Airtel, and Telkom) complete with lines.	4	6
	(ii) Wireless backup for the pilot exchange line.	1No.	1No.
5.	PC Based Operator Consoles	1	1
6.	Operator Head Sets	2	2
7.	Operator Hand Sets	2	2
8.	Branch Connectivity IP Telephony	At least - 1 No. In an environs, where the internet service infrastructure would allow.	System must support NOT less than 2 branches to connect, for future expansion as centralized architecture.

2.33 OTHER MINIMUM REQUIREMENTS FOR THE IP-PABX

The IP-PABX shall: -

1. be fully IP
2. be VOIP ready
3. have duplex CPU
4. be ready to connect to LAN and also support branch connectivity where WAN/internet service is available.
5. be ISDN ready
6. must be able to **support five digits** extensions numbering plan
7. have at least 50% power failure trunk transfer facility

8. must be capable of offering unified communication services (voice, video & data convergence)
9. be capable of connecting/transferring an incoming call to a mobile service when the extension user is not at his desk.
10. have a UPS of at least 8 hrs autonomy.
11. have direct inward dialing system access facilities and data communication services.
12. be of compact modular design with sub-lines pre-wired and easily removable
13. be equipped with flexible music on hold
14. have call forwarding automatic call transfer, three party conference among other standard features.
15. be equipped with mains power supply Anti-surge, over-voltage and under-voltage protection devices and lightning protectors for all cards.
16. Have on screen fault indication facility.
17. be supplied with telephone call management and information software based system with a memory capable of storing at least 20,000 calls, and be supplied complete with a PC and a printer for the telephone call management
18. be complete with a maintenance terminal facility.
19. be **type approved by the Communications Authority of Kenya**. The bidder is required to submit the CAK type approvals.
20. be **compatible** for connection to Telkom Ltd, Safaricom networks etc.

2.34 TELEPHONE MANAGEMENT SYSTEM

Scope of Works

The works to be carried out comprise supply, installation, testing and commissioning of the following:

- a) Telephone call management software
- b) 1 No. Desktop computer
- c) 1 No. Medium duty laser printer
- d) 1No. Medium duty UPS

Technical Specifications

1. Call Management Software

System Capabilities

The software system shall be able to perform the following:

1. Telephone calls tracking
2. Telephone calls costing/billing
3. Telephone calls budgeting
4. The software system shall be fully window based and run as a background task
5. All telephone call costs shall be computed basing on the prevailing service provider's rates, or shall be customized for employer's own use.
6. The software system shall have the capability of automatically barring and unbarring exchange lines and level 9 lines that shall go beyond their budget allocation and automatically reinstate them on budget re-allocation.
It shall also have the capability of automatically barring and unbarring roaming PINS that shall go beyond their budget allocation and automatically reinstate them on budget re-allocation.
7. The software system shall be able to allocate password to the users.

Reports Generated

The call management software shall be able to generate the following: -

1. Dates of calls
2. Duration of calls
3. Extension numbers where calls originate
4. Approximate cost of trunk calls
5. Time of calls
6. Detailed report on call transfers
7. Details of exchange lines used
8. Details of extension lines used
9. Detailed report of most frequently called numbers
10. Detailed report of longest calls for selected duration
11. Detailed report of mobile calls by extensions
12. Detail of most expensive calls within selected time
13. Graphical presentation of reports.

2.35 BROCHURES AND TECHNICAL LITERATURE

Tenderers **Must** enclose together with their submitted bids brochures detailing technical Literature and specifications of the IP-PABX and IP network telephone instruments and the UPS. The brochures shall be used to evaluate the suitability of IP-PABX and the associated accessories. **Any bid submitted without the brochures shall be considered technically non-responsive, and shall subsequently be disqualified.**

2.36 TECHNICAL SPECIFICATION FOR COMPUTER AND ACCESSORIES

A) SPECIFICATIONS FOR DESKTOP COMPUTERS

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	BIDDER'S SPECIFICATIONS
A	GENERAL SPECIFICATIONS		
1	Make	BRANDED	
2	Model	HP Workstation Z600	
3	Country of Origin		
4	Manufacturer's brochure and specifications	Must be supplied	
B	TECHNICAL SPECIFICATIONS		
5	Processor	Intel® Xeon with AMD Graphics Card (2.4 GHz, 12 MB cache, Quad Core)	
6	System Memory	32 GB DIMM 240-PIN	
7	Disk cache	Integrated 12MB L2 cache Bus Speed 2700 MHz	
8	Storage sub system	1 TB 7200 rpm SATA SSD	
9		DVD / CD-Writer Drive Memory Card Reader	

10	Display/Graphics	21" TFT Screen (Free Standing-Adjustable)	
11	Keyboard	PS/2 Enhanced keyboard	
12	Pointing device	PS/2 Compatible Optical mouse	
13	Audio/ Graphics Systems	❖ PCI 3D audio/video cards ❖ TV/FM cards ❖ Amplified speakers (External)	
14	Communication Interface	❖ 10/100/1000Gbs fast ethernet, RJ 45 jack ❖ 56K ITU V.90 data/fax modern, wake-on-ring ready	
15	Operating System Pre-load plus CDs	Windows 10 Professional 64	
16	Application Software, pre-installed, registered and CDs supplied	MS OFFICE 2017 OR MS OFFICE XP PRO (2017 Version)	
17	Power sub- system	220-240V ac, 50HZ	
18	Power extension cord	At least four outlets with surge protection	
19	WARRANTY	One year parts replacement warrant	

B) SPECIFICATIONS FOR MEDIUM DUTY LASER PRINTER

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	BIDDER'S SPECIFICATIONS
A	GENERAL SPECIFICATIONS		
1	Make	BRANDED	
2	Model		
3	Type	Desktop	
4	Country of Origin		
5	Manufacturer's brochure and specification	Must be supplied	
B	TECHNICAL SPECIFICATIONS		
6	Resolution	1200x1200 dpi	
7	Printing speed	21 ppm	
8	Duplex function	Standard	
9	Memory	16 MB expandable to 72 MB	
10	Languages	Enhanced HP PCL, postscript	
11	Maximum Media size	A4 paper	
12	Media types	Plain paper, envelopes, transparencies, labels, postcards	
13	Media input capacity	250 sheet input cassette	

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	BIDDER'S SPECIFICATIONS
14	Connectivity	❖ IEEE – 1284 compliant bi-directional parallel port ❖ 2.0 compliant USB port	
15	Duty cycle	60,000 pages per month	
16	Operating system support	All MS windows/ Open Source	
17	C P U	Power PC 405/200 MHZ	
18	Power Supply	240V ac, 50HZ	
	WARRANTY	One year parts replacement warranty	

C) SPECIFICATIONS FOR LIGHT DUTY UPS

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	BIDDER'S SPECIFICATIONS
A	GENERAL SPECIFICATIONS		
1	Make	BRANDED	
2	Model		
3	Country of Origin		
4	Manufacturer's brochure and specification	Must be supplied	
B	TECHNICAL SPECIFICATIONS		
5	Rating	650VA	
6	Input voltage swing	220 – 270V ac	
7	Output voltage	220-240V ac	
8	Output frequency	50-60HZ auto-sensing	
9	Protection	❖ Output overload ❖ Input/output short circuit	
10	Communication Interface	Serial port communication support	
11	Design	❖ Automatic voltage regulation ❖ Mains isolation ❖ User replaceable batteries ❖ Static-automatic bypass ❖ Maintenance bypass	

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	BIDDER'S SPECIFICATIONS
12	Battery Module	<ul style="list-style-type: none"> ❖ 25 minute backup time ❖ 3 year lifetime ❖ Sealed lead acid type preferred ❖ Automatic periodic battery tests ❖ Short recharge time (maximum 5 hours for 100% run time) ❖ Protection against excessive discharge 	

Other Items to be supplied:

- 1) Power Supply extension cable complete with 13A 3pin plug and 4x13A switched socket outlets panel which is complete with inbuilt overcurrent/overvoltage/surge protection

2.37 ITEMS TO BE STATED BY THE TENDERER

Delivery period from date of award of contract..... weeks

Period required for installation from receipt of equipmentweeks

What is the name and model number of the proposed IP-PABX for which you have tendered?
.....

In which countries is the PABX and it PCB's manufactured.....
.....

With what standards does the IP-PABX comply?

Is a full stock of spares available in Kenya?

For how many years is the continuity of spare parts guaranteed? (A minimum of 10 years is required) years

What is the busy hour traffic capacity of the IP-PABX assuming no delay in main exchange dial tone?

What is the maximum ambient temperature in which the PABX will function satisfactorily?
.....

Is air conditioning required for the IP-PABX?

Is protection against high transient line voltage incorporated?

How many pairs are required per extension line?

Is the operator's console suitable for a blind operator?

What is the warranty period offered?

(Note: 12 months is the minimum)

Is an MDF incorporated in the PABX?

Is the POE incorporated in the PABX?

Capacity of the standby battery in A.H.....

Output of charger in Amps

Provide a comprehensive list of other places and contacts where the proposed IP-PABX is installed and working (a separate sheet may be used)

.....
.....

Provide a list of branch offices and contacts for purposes of future maintenance when the proposed IP-PABX is installed and extended to the counties and sub- counties (a separate sheet may be used)

.....
.....

PART 2 - TECHNICAL SPECIFICATIONS FOR THE CCTV AND ACCESS CONTROL SYSTEM

2.01 EXTENT OF WORKS FOR SECURITY SURVEILLANCE SYSTEM

The security surveillance system should consider the following.

IP CCTV Camera. The cameras specified should be able to cover the distance with clear pictures. The resolution of the cameras should be able to give motion pictures that are clear.

LED Monitors. The color monitors must be of high resolution and preferably of plasma screen. The size of the monitor should be big enough to allow the operators make correct deductions both in real time operation and during playbacks.

IP Network Video Recording. The recording multiplexer resolution has to be equally high for the monitor to display with a high resolution.

The IP Surveillance system should be able to support the following

- IP based recording system with motion detection.
- Digital zooming into recorded images/ live view
- Multi-level password protection and logging facilities
- Integrates with access control, burglar control, burglar alarms and Fire alarm system and other building management systems as may be specified by the engineer.
- Image compression for remote web live and playback viewing incase of IP.
- Multi display monitors
- Automatic daily archiving to hard drive or optical drive.

- Fully adjustable digital video motion detection with exclusion /inclusion multi regions per camera.
- Efficient video collection, storage and retrieval.
- Advanced and instant search capability
- Digitally signed recordings, with audit trails of all operator actions and system event.
- Sufficient Storage capacity of the Network Video Recorder.
- Infra red illuminators in poor lighting conditions
- Able to interface with other systems on the ground
- Support IP and PoE connectivity.

2.02 MINIMUM ALLOWABLE TECHNICAL SPECIFICATIONS FOR THE CCTV SYSTEM

2.02.1 GENERAL SPECIFICATIONS FOR THE CAMERAS

The cameras are classified into two main types

a) Fixed cameras –

These cameras have a fixed area of view depending on its angle of view and the focal length of the lens used.

They can be used in door and outdoor depending on the requirements. When used out door, the cameras are housed in a weather proof housing of IP66. Those used indoor come with different shapes of housings. The exview housings are used for cameras covering long distances like corridors and the dome housings are used for common areas like lobbies, security desks etc.

b) Pan Tilt and Zoom Cameras

These cameras are only used to support the static cameras. They are useful as they are able to pan 360 degrees, tilt over 90 degrees and zoom into an object for Min 16 times and above.

The cameras shall be indoor type and outdoor type with PoE/ 240V main supply with the appropriate power adaptors, 50Hz field frequency and operating according to the CCIR standard with minimum resolution of 2megapixels.

The camera shall be fixed on sliding rail track on the ceiling slab or walls as directed by the Electrical Engineer with an appropriate bracket.

It shall be possible to control the lens and the pan only head remotely via a remote control box at the control room. The Camera must be able to be controlled by a CCTV keyboard

They shall be linked to the Television Monitors and the Control Equipment through CAT 6A cables as appropriate and according to the project Engineers instructions.

The mounting height and position of cameras shall be such that the desired coverage shall be achieved as distinctly as possible.

2.03 MINIMUM REQUIREMENTS FOR THE CCTV CAMERAS

The cameras shall have the following minimum specifications but cameras with higher specifications shall be accepted:

a) IP Bullet camera (CCTV camera Type 1)

- 5Mega Pixel Full HD Outdoor IP Bullet Camera with Infrared
- Built in Infrared 30 meters minimum
- imaging sensor – 1/1.8” minimum
- Wide Dynamic Range – 120dB
- Fixed Lens length of 3.7 mm
- Day and night vision; Minimum illumination 0.08lux (colour), 0lux (B/W) IR on
- Focal Length – 4~9mm
- IP network capable
- PoE capability
- H.265 video compression
- Accessible edge storage with 64GB internal MicroSD card slot
- True day and night vision capability
- Tampering detection, Loitering, Face Detection, Audio Detection, Motion detection, Sound Classification, Heat map, People Counting, Queue management, defocus detection, Bi-directional audio I/O communication, Network Disconnect, defog
- Masking Capability,
- Vandal proof IK-10 rating housing
- Weather proof IP66 rating
- ONVIF Compliant

(State make and type, and enclose catalogues)

b) IP PTZ CCTV Camera (CCTV camera Type 2)

- 2 Mega Pixel Full HD IP Dome Camera with Infrared
- Built in Infrared 150 meters minimum
- imaging sensor – 1/2.8” minimum
- Wide Dynamic Range – 120dB
- Varifocal Auto Iris lens
- Minimum Adjustable digital zoom 16x, optical zoom 32x
- Day and night vision; Minimum illumination 0.1lux (colour), 0lux (B/W) IR on
- Focal Length – 4.5~140mm
- IP network capable
- PoE capability
- Endless 360 degree pan rotation
- 180 degree tilt
- H.264 video compression
- Accessible edge storage with 64GB internal MicroSD card slot
- True day and night vision capability
- Tampering detection, Face detection, Audio Detection, Enter/Exit, Appear/Disappear
- Masking Capability,
- Vandal proof IK-10 rating housing
- Weather proof IP66 rating
- Heater, Blower and Defog
- Auto tracking
- ONVIF Compliant

(State make and type, and enclose catalogues)

c) IP Dome CCTV Camera (CCTV camera Type 3)

- IP 12MP High Definition 4k Vandal Proof Dome camera
- 1/1.7" CMOS imaging sensor with 120db WDR.
- Motorized Varifocal length of 4.5 to 10 mm lens
- IR Viewable Length 40m
- Minimum illumination 0.3lux (colour)
- Frame rate of 30fps at 8MP
- True day and night vision capability (ICR)
- IP network capable – IPv4/IPv6
- PoE capability
- H.265 video compression
- Tampering detection, Audio Detection, Motion detection, defocus detection, Bi-directional audio I/O communication, Network Disconnect, defog and event triggered alarm processing
- Masking
- Accessible Edge Storage with internal 128GB MicroSD card slot and complete with a 128GB MicroSD card
- ONVIF compliant application programming interface
- Web viewer/browser support
- Vandal proof IK-10 rating housing
- Weather proof IP66 rating

(State make and type, and enclose catalogues)

d) IP Dome CCTV Camera (CCTV camera Type 4)

- 5 Mega Pixel Full HD IP Dome Camera with Infrared
- Built in Infrared 30 meters minimum
- imaging sensor – 1/1.8" minimum
- Wide Dynamic Range – 120dB
- F1.6 lens
- Day and night vision; Minimum illumination 0.2lux (colour), 0lux (B/W) IR on
- Focal Length – 7.0mm
- IP network capable
- PoE capability
- H.265 video compression
- Accessible edge storage with 64GB internal MicroSD card slot
- True day and night vision capability
- Tampering detection, Motion detection, defocus detection, Face Detection, Audio detection, Digital Auto tracking, People counting, heat mapping, Queue management, sound classification and hallway view.
- Masking Capability
- Vandal proof IK-10 rating housing
- Weather proof IP66 rating
- ONVIF Compliant

(State make and type, and enclose catalogues)

e) IP Indoor Auto dome PTZ CCTV Camera (CCTV camera Type 5)

- 2 Mega Pixel Full HD indoor IP Auto Dome Camera with Infrared
- Built in Infrared 150 meters minimum
- imaging sensor – 1/2.8" minimum
- Wide Dynamic Range – 120dB
- Varifocal Auto Iris lens
- Minimum Adjustable digital zoom 16x, optical zoom 32x
- Day and night vision; Minimum illumination 0.1lux (colour), 0lux (B/W) IR on

- Focal Length – 4.5~140mm
- IP network capable
- PoE capability
- Endless 360 degree pan rotation
- 180 degree tilt
- H.264 video compression
- Accessible edge storage with 64GB internal MicroSD card slot
- True day and night vision capability
- Tampering detection, Face detection, Audio Detection, Enter/Exit, Appear/Disappear
- Masking Capability,
- Weather proof IP54 rating
- Auto tracking
- ONVIF Compliant

(State make and type, and enclose catalogues)

2.04 MOUNTING BRACKETS

The Brackets shall:

Be suitable for wall or ceiling mounting of a single camera.

Be at least 5.5"length

Have an auto lock facility.

2.05 CAMERA HOUSING

The camera housing shall:

Be IP66 and IK-10 rated with integral cable management.

Be Weatherproof and constructed from aluminium with epoxy coating.

2.06 COLOR VIDEO MONITORS

The monitor should be capable of providing high levels of picture quality 10MHz bars visible at low brightness and reliability stable synchronization, black level clamping, low sensitivity and high stability.

The monitors shall be high performance color video monitors for monitoring scenes from the above cameras and viewing playback scenes from the video cassette recorders. The monitors shall be located at places to be shown on site by the project manager.

The monitor shall give stable and interference free pictures of scenes being viewed. It shall also conform to the following specifications:

Type	: Full HD; LED; 50,000hours panel life
System	: NTSC/PAL
Screen size	: 40"/32"
Resolution	: 1,920 x 1,080 optimized for CCTV applications
Display Colour	: 16.0 million
Brightness	: 350cd/m ²
Contrast Ratio	: 5,000:1
Video input signal	: 1.0 V pk-pk
Power consumption	: Not more than 80W
Power input	: 240V 50HZ
Interface	: VGA, DVI, HDMI, RGB, Audio, Video
Connectivity	: Ethernet, RS-232C remote control
Viewing Angle	: 178° / 178°

(State make and type, and enclose catalogues)

2.07 NETWORK VIDEO RECORDER

The network video recorder shall have the following minimum requirements:

- 64 Channels
- Recording speeds of at least 400Mbps
- Gigabit Ethernet connection
- Multi screen Display: Full/4/9/16 way or as appropriate.
- 10 Hot swap HDDs (RAID 5)
- external storage support capability
- VGA/HDMI local monitor
- Redundant hot swap power supply
- Network management/viewer software
- Smartphone support
- In built intelligent video analysis
- H.265,MPEG,MJPEG Compression
- ONVIF compatibility
- Web viewer supported
- PoE enabled
- Storage capacity : 96TB
- Smart Video Search Feature for streamlined Investigations
- Recording resolution of 5MP
- IP address filtering, user access log, authentication and encryption
- Auto Launch of Video on specified Alarms/Events
- LED status indicator
- CE,UL certification

(State make and type, and enclose catalogues)

2.08 CCTV MANAGEMENT SOFTWARE

CCTV management software with the following minimum specifications:-

- Event Recording Scheme
- Operate Motion-Detector-Recording
- NTSC-PAL video recording.
- Be capable of recording real time images at full resolution and frames rate.
- Features for connection for alarm system Automatic Recycling
- Users' passwords.
- Input, Output, Audio Alert Facilities
- Remote Viewing Facilities, TCP/IP, INTERNET, ISDN, modem
- Capability of streaming into the client's existing LAN / WAN infrastructure
- Ability to quickly search through thousands of hours of recorded video information
- Event-triggered video recording to reduce storage requirements
- Masks out disturbing areas, or areas of no interest, within the specified region
- Identifies & immediately alerts user to potential security breaches
- Features should be able to be used at very low frame rates
- Easy calibration for specific applications
- Color-matching matches user-specified colour to the video image
- Functions in outside environments with changing light conditions:
- Auto-learning of background feature
- Object saliency and object Consistency mechanisms to filter out phantom objects
- "Out of Focus" condition is user-calibrated by level of focus
- Automatic self-test of camera validity
- Motion Trajectory Analyzer provides advanced analysis of the motion of objects
- Seamless integration into Enterprise security knowledge management solution.
- Analysis of stationary objects

(State make and type, and enclose catalogues)

2.09 UNINTERRUPTIBLE POWER SUPPLY (UPS)

This shall be an on-line Un-interruptible power supply with output rating able to provide power to the security surveillance system a minimum of 8 hours incase of power failure.

It shall be microprocessor- based so that both output voltage and frequency are closely regulated and continuously monitored and also provide system diagnostic and shut down protection functions. It shall feature a maintenance by-pass to enable normal routine maintenance operations to be performed without interruptions to the system.

It shall be fitted with both visual and audible alarms to indicate any change in equipment status such as:

input power problems

ups faults

ups overload

battery discharging

Other parameters are:

Input supply: 240VAC50HZ

Power factor: 0.8 lag at full load

Current limit: 125% of the normal

Output voltage: 240V AC 50 HZ

Output voltage tolerance: 2%

Output frequency tolerance : 0.05%

(State make and type, and enclose catalogues)

2.10 CABLING

- a) All cables must pass through conduits or trunking.
- b) All cables and connectors shall be labeled.
- c) No distortion due to kinks, sharp bends or excessive hauling tension shall be allowed.
- d) Cables shall be run in a manner eliminating any possibility of strain on the cable itself or on the terminations.
- e) Cables shall have no joints or splices.
- f) Cables shall be kept at a minimum distance of 150mm from items liable to become hot or cold.
- g) Bending radii shall be not less than eight times the overall cable diameter.
- h) The manufacturers hauling tension shall not be exceeded.
- i) All cable ties and fixings shall be tightened to support the cable loom without distortion of the cable sheath.
- j) The STP 4 pair shall be of cat 6A grade and exceed ANSI/TIA/EIA-568-Aj and ISO/IEC 11001standards. Cat 6A structured cabling shall be used throughout the entire installation.

(State make and type, and enclose catalogues)

2.11 PATCH PANELS

- a) Shall conform to ANSI/TIA/EIA-568A and rack mounted.
- b) Shall be equipped with RJ45 contacts of Cat 6A sockets with capacity of 12, 24 or 48 ports.
- c) Shall be earthed.

- d) Except for patch cords used to connect NICs to the RJ45 sockets, all patch cords shall be labeled at each extremity with PVC support and intelligible marking. For other components the label shall be of stiff plastic PVC type.

(State make and type, and enclose catalogues)

2.12 CORE SWITCH

The active control equipment at the core should have the following features:

Technical Specifications	Requirement
LAN Interface Modules	16 SFP+
Chassis	
Chassis Slots	4
Fixed Slots (for Control Modules)	1
Open Slots (for Port Modules)	3
Max. Switching Capacity	500 Gbps
Max. Packet Forwarding Rate	400 Mbps
Maximum Port Density	
10/100/1000Base-T Ports	144
10/100/1000Base-T Ports with PoE	144
Gigabit SFP Slots	144
10-Gigabit SFP+ Slots	48
Dimensions	≤ 8U
Operating Temperature	0° to 50°C
Operating Humidity	10% to 90% RH
L2 Features	
MAC Address Table	32K per I/O module
Flow Control	-802.3x Flow Control -HOL Blocking Prevention
IGMP Snooping	-IGMP v1/v2/v3 Snooping -Support 2K groups -IGMP Proxy2 -Host-based IGMP Snooping Fast Leave
802.3ad Link Aggregation	-Compliant with 802.1AX and 802.3ad -Max. 128 groups per device, 8 ports per group -Support cross-module trunk
power supply	The core switch should have redundant power supply, redundant fan tray and redundant CPU/ supervisor engine installed

(State make and type, and enclose catalogues)

2.13 EDGE SWITCHES

Active control equipments at the LAN Edge should have the following features

- a) Active control equipments at the LAN Edge should support 10/100/1000 MBPS on all ports (RJ45) and Gigabit to the camera connectivity
- b) The equipments should have at least two 1000BaseXGigabit uplink ports for terminating backbone Fiber.
- c) The equipments should support layer 3 routing.
- d) Should support IEEE 802.1, SSH, SNMP.
- e) Switch Fabric forwarding Bandwidth of 64GBPS or more.
- f) More than 12,000MAC addresses should be available on each switch.
- g) The switches should have 8/12/24/48 ports of 10/100/1000 MBPS.
- h) Each stack on the edge will have two links of Fiber to the core switch, totaling two fiber terminations from the core switch to the stack.
- i) Should support Jumbo frames.
- j) Total stack throughput bandwidth of 64 GBPS or more.
- k) Active Edge switches should be quoted with a minimum of **One year of warranty** covering free replacement of parts and units.
- l) The switches to be PoE plus

(State make and type, and enclose catalogues)

2.14 NETWORK CABINET

- a) The cabinet shall be metallic with front clear glass and of good finish and conveniently accessible by technical personnel for maintenance. The main cabinet shall be at least 42U and other cabinets housing edge switch should be at least 12U/9U
- b) Power to the cabinet shall be switched off from within the cabinets. Proper power socket cables to be supplied with the cabinet.
- c) The cabinet for active devices shall conform to ANSI/TIA/EIA-568A specifications with forced cooling.
- e) Support small factor pluggable (SFP) and industry leading density up to 240 of IEEE 8033 for 1000 Base-SX ports per system.
- c) Cabinets shall have adequate room for additional components typically 3U free space.

(State make and type, and enclose catalogues)

2.15 LABELING

- a) Horizontal and backbone cables shall be labeled at each end. The cable or its label shall be marked with its identifier.
- b) A unique identifier shall be marked on each faceplate to identify it as connecting hardware.
- c) Each port on the face plate shall be labeled with its identifier.
- d) A unique identifier shall be marked on each piece of connecting hardware to identify it as a connecting hardware.
- e) Each port on the connecting hardware shall be labeled with its identifier.
- f) A unique identifier shall be marked on each **port** on the connecting faceplate to identify it as a connecting hardware.

2.16 OPTICAL FIBER CABLE

The fiber cable must be 8 core single mode fiber cable with the following specifications:-

- a) Cable size: 8 cores.
- b) Termination: SC Duplex connectors.
- c) Graded Index: Nominal 62.5/125 micron

(State make and type, and enclose catalogues)

2.17 FIBER PATCH PANELS

All Backbone Fiber links should be terminated on Fiber Patch Panels. Connector interfaces should support ST, Sc simplex, Sc duplex, FC, LC or MT-RJ.

(State make and type, and enclose catalogues)

2.18 BACK BONE

Backbone cabling inclusive of switches and all necessary accessories shall be carried out in readiness for the termination of edge switches.

The Backbone cabling shall be flexible and allow for easy 'add ons' for future expansions. Hence enough capacity shall be allowed for future expansion. It shall be done using the star topology.

3.00 ACCESS CONTROL - SYSTEM

3.01 THE INTELLIGENT SYSTEM CONTROLLER

The controller is the main item for control access system, when specifying, the engineer has to bear the following.

The controller shall have a built in power supply, with a battery back up facility and sufficient power to drive the number of doors with access control.

The control should be able to provide time zoning, extensive door monitoring, logging of all events and hardware alarms – output.

User's parameters shall be done locally in the stand alone via a portable and easy to use compact programme using the English Languages Software.

The controller should be able to use the proximity cards or the magnetically encoded keys as identifiers as specified by the engineer.

It shall have the following features

- Bi- processor Central Processing Unit
- With lead battery back up with four (4 hrs) hours autonomy incase of network failure.
- Autonomous clock/calendar chip with automatic management of regular/daylight saving time with autonomy of one hour.
- Management of peer to peer connection with other servers and as a consequence a high decision making capability and full operative autonomy.
- Up to 2500 transactions stored on a removable cartridge with a flash EPROM memory. The server as specified by the Engineer should be able to store the transactions for a minimum of two months. The speed of the server to be such that the programming and communication between the card readers and other interface units is fast.

3.02 BIOMETRIC (FINGER) AND PROXIMITY CARD READER

-shall have biometric state of the art finger print reader

-Be Bi-directional and meets requirements for HID Proximity cards (standard ISO/ABA 125 KHz, up to 4cm of distance).

-Have Alphanumeric Liquid Crystal Display (LCD), back lit, with two lines of 16 characters each, for the visualization of time data, guide messages for the user, and service messages.

- Should have 2 multicolor LED: Green for the access granted, Red for invalid transaction, Yellow for Echelon Service function.
- Variable Tones for valid/invalid transactions.
- Have a USB Port, RS-485 communication interface, contactless read/write smart card technology
- Lon Works cabling Interface should be done using unshielded twisted pair cable in free topology. (Transceiver FTT10A, 78Kbps)
- Meets IP31 level of protection
- atleast 500 fingerprint user capacity
- atleast 500 valid cards capacity
- It should be able rated to operate within 0°C ÷ +50°C temperature range
- It should be rated to operate up to a relative humidity 95% without condensation or as otherwise specified by the engineer for special cases.
- Must meet all laid down international Electromagnetic Compatibility standards

3.03 PROXIMITY CARD

The cards shall be of a biometric type and that can accommodate a customer logo, photographs and text should they be required and they shall have a high coercively magnetic strip.

3.04 MAGNETIC DOOR CONTACTS

They shall be of the magnetic reed switch and with appropriate magnet able to handle at least a minimum of 200KN and also of the normally open type

3.05 2- DOOR ACCESS CONTROLLER

The controller shall be capable of controlling 1No.(one) or 2 No.(two) doors in a stand – alone mode.

The controller shall have a built in power supply, with a battery back up facility and sufficient power to drive two locks.

The control should be able to provide time zoning, extensive door monitoring, logging of all events and hardware alarms – output.

Users parameters shall be done locally in the stand alone via a portable and easy to use compact programme using the English Languages Software.

The controller should be able to use the magstripe cards or the magnetically encoded keys as identifiers.

The card readers shall have a Pin-pad.

The power for the reader and for the electric lock shall be supplied via the controller.

3.06 MAGESTRIPS CARD

The cards shall be of a type that can accommodate a customer logo, photographs and text should they be required and they shall have a high coercivity magnetic strip.

3.07 DOOR CONTACTS

They shall be of the magnetic reed switch and the appropriate magnet and also of the normally open type.

3.08 HAND HELD METAL DETECTOR

Should meet the following minimum requirements

- Contact free inspection
- Extremely high detection performance
- Audible and vibrating alert
- Automatic zero compensation
- LED for visual metal detection

- Sensitivity of between 11cm to 40cm detection distance in air
- Meet DIN EN ISO9002 quality standard, VDE 0848 TEIL4 and A3 security standards

3.09 RACK MOUNTED UNINTERRUPTIBLE POWER SUPPLY (UPS)

This shall be Rack mounted on-line Un-interruptible power supply with output rating able to provide power to the security surveillance system and controlled access system for a minimum of 8 hours incase of power failure.

It shall be microprocessor- based so that both output voltage and frequency are closely regulated and continuously monitored and also provide system diagnostic and shut down protection functions. It shall feature a maintenance by-pass to enable normal routine maintenance operations to be performed without interruptions to the system.

It shall be fitted with both visual and audible alarms to indicate any change in equipment status such as:

input power problems

ups faults

ups overload

battery discharging

Other parameters are:

Input supply: 240VAC50HZ

Power factor: 0.7 lag at full load

Current limit: 125% of the normal

Output voltage: 240V AC 50 HZ

Output voltage tolerance: 2%

Output frequency tolerance : 0.05%

3.10 X-RAY BAGGAGE SCANNER

Should meet the following minimum requirements|:

- A tunnel opening of 620mm wide by 418 mm high
- Conveyor speed at 50Hz mains frequency of 0.24m/s
- Conveyor should be able to carry up-to 160 Kg of evenly distributed load.
- High resolution and able to detect 39AWG(0.09mm)
- 17" color monitor
- High image resolution
- High speed digital signal transmission using 24 bit real time image processing
- Advance material classification system
- Online image analysis
- Electronic zoom facility
- Image presentation in B/W and color
- Digital video memory of 1280*1024 at 24 bits
- X-ray leakage should meet applicable international standards relevant to X-ray emitting devices
- Constructed of heavy duty rustproof material for extremely durable and tamper proof operation.

3.11 WALK THROUGH METAL DETECTOR

The walk through metal detector should have the following minimum features:

- Multi-zone panel version
- Passage way internal size 760x2030x580mm(WxHxD)
- Detection Zones: Atleast 33No.Zones

- Power Supply: 240V, 50Hz
- Adjustable sensitivity with range settings
- Programmable operation
- Programming access protected by mechanical lock and passwords
- High immunity to both electrical and mechanical interference
- Easy maintenance
- Control unit incorporated in the detector
- High intensity display using green and red signals
- High intensity audible alarm signal with programmable volume/tone
- Signal to be proportional to the mass of the object detected
- Facility for networking via built-in keypad and RDU or RS232/ RS485 serial connection
- Multi-zone display bar for height of person localization
- Should be harmless to: pacemakers, life support systems, pregnant women, magnetic storage media.
- Photo transit counter
- Emergency batteries for 6.5 hours independent operation capability
- Constructed of heavy duty materials for extremely durable and tamper proof operation.
- Conform to FAA, (3-GUN-Test), NILECJ-0601-00 standards for all security levels, EC regulations, all international standards relating to electrical safety.

3.12 Access control Server Controller

- a) Bi-processor CPU68EN302, including a Motorola 68000 (32 Bit architecture) and Ethernet communication processor.
- b) 1 MByte FLASH to download the application firmware.
- c) MByte FLASH EPROM on a removable cartridge for the download of the permanent database and for the transit and events buffer. Optional memory with 8 Mbytes Flash Memory Available.
- d) 1MByte RAM for the activity.
- e) Management of up to 12 Temakeys terminals
- f) Management of upto 64 I/O
- g) Upto 10,000 cards and 2,500 transactions stored on a removable cartridge with flash EPROM memory.
- h) Management of peer to peer connection with the other tema server and as a consequence high decision making capability and full operative autonomy.
- i) Autonomous clock/calendar chip with automatic management of regular /daylight saving time with autonomy of 1.000 hrs in case of power failure.
- j) Lead battery back up with full functionality for 4 hours in case of network failure and signaling o the battery status.

3.13 Biometric Clocking Machine

- shall have biometric state of the art finger print reader
- Be Bi-directional and meets requirements for HID Proximity cards (standard ISO/ABA 125 KHz, up to 4cm of distance).
- Have Alphanumeric Liquid Crystal Display (LCD), back lit, with two lines of 16 characters each, for the visualization of time data, guide messages for the user, and service messages.

- Should have 2 multicolor LED: Green for the access granted, Red for invalid transaction, Yellow for Echelon Service function.
 - Variable Tones for valid/invalid transactions.
 - Have a USB Port, RS-485 communication interface, contactless read/write smart card technology
- Lon Works cabling Interface should be done using unshielded twisted pair cable in free topology. (Transceiver FTT10A, 78Kbps)
- Meets IP31 level of protection
 - atleast 1,000 fingerprint user capacity
 - atleast 1,000 valid cards capacity
 - It should be able rated to operate within $0^{\circ}\text{C} \div +50^{\circ}\text{C}$ temperature range
 - It should be rated to operate up to a relative humidity 95% without condensation or as otherwise specified by the engineer for special cases.
 - Must meet all laid down international Electromagnetic Compatibility standards

TECHNICAL SCHEDULE

1. General Notes to the Tenderer

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

TECHNICAL SCHEDULE

The tenderer must complete in full the technical schedule. Apart from the information required in the technical schedule, the tenderer **MUST SUBMIT** comprehensive manufacturer's technical brochures and performance details for all items listed in this schedule (fill forms attached).

A. Structured Cabling and IP-PABX

ITEM	DESCRIPTION	TYPE/MAKE	COUNTRY OF ORIGIN
1.0	Core switch		
2.0	Edge switch		
3.0	CAT 6A cables		
4.0	Patch panels		
5.0	Patch Cords		
6.0	Fiber optic cable		
7.0	Cable managers		
8.0	UPSs		
9.0	Data Cabinets		
10.0	I.P PABX		
11.0	Telephone Instruments		
12.0	Faceplate		

Catalogue must be attached for all the items in the schedule of material above

B. CCTV and Access Control

ITEM	DESCRIPTION	TYPE/MAKE/CATALOGUE No.	COUNTRY OF ORIGIN
1.	Cameras a) TYPE 1 b) TYPE 2 c) TYPE 3 d) TYPE 4 e) TYPE 5		
2.	Servers a) Storage Server		
3.	Video Management Software (VMS)		
4.	Network Video Recorder		
5.	LED monitors/display		
6.	Network Switches a) Core Switch b) Edge Switch		
7.	Patch panels/patch cords		
8.	UPS		
9.	CAT 6A cables		
10.	Fiber Cable		
13.	Data Cabinet		
14.	Access Control		

Catalogue must be attached for all the items in the schedule of material above

CONDITIONS OF SUB-CONTRACT AND APPENDIX

The successful tenderer shall be required to enter in a sub- contract agreement with the main contractor under the terms of the standard KABCEC conditions of subcontract which shall be amended and completed as follows:

Clause 28: Fluctuations; Sub-clause 28.2-28.4 shall be omitted. The contract shall be a fixed price contract.

The appendix shall be completed as follows:

APPENDIX	Clause
Name of sub-contractor's insurers	6.0.....
Name of sub-contractor's surety	7.0.....
Amount of surety	7.0: 10% of contract sum
Period of possession of site	8.1.....
Date of commencement of works	8.2.....
Date for practical completion	8.2.....
Interval for application of payment certificates	23.1..... 1 month
Minimum amount of payment certificate	23.4..... Kshs. 500,000.00
Percentage of certified value retained	23.6..... 10%
Limit of retention fund, if any	23.6..... 5%
Name of the sub-contractor's bank for purposes of interest calculation.	23.7, 23.8.....
Defects liability period	23.11..... 12 Months
Period of final measurement and valuation	23.12..... 12 Months
Damages of delay in completion	27.1 at the rate of Kshs.....
	.. As per Main contract

BILL OF QUANTITIES

- (i) The Tenderer shall complete all the BQ unit rates schedules. The BQ unit rates schedule shall be read in conjunction with the specifications and the drawings.
- (ii) The total prices in the main summary of price schedules shall be deemed to include all obligations under the Contract including and not limited to supply of materials equipment, apparatus, fittings, spares, tools, insurance, delivery to site, storage, installation, testing and commissioning in accordance with this specification.
- (iii) Any prices omitted from any section or part of price schedule shall be deemed to have been included in another item, section or part.
- (iv) All prices shall be duty paid and shall also be inclusive of all taxes current at the time of tendering.
- (v) Where client wishes to supply some items of work the contractor will be required to quote for labor rate for fixing the item.

PROPOSED LIBRARY FOR KARATINA UNIVERSITY: STRUCTURED CABLING, IP-PABX, CCTV AND ACCESS CONTROL

PRELIMINARIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	KSHS
1	Discrepancies clause 1.02				
2	Conditions of contract Agreement clause 1.03				
3	Payments clause 1.04				
4	Site location clause 1.06				
5	Scope of Contract Works clause 1.08				
6	Extent of the Contractor's Duties clause 1.09				
7	Firm price contract clause 1.12				
8	Variation clause 1.13				
9	Prime cost and provisional sum clause 3.14 (insert profit and attendance which is a percentage of expended PC or provisional sum.)				
10	Bond clause 1.15				
11	Government Legislation and Regulations clause 1.16				
12	Import Duty and Value Added Tax clause 1.17 (Note this clause applies for materials supplied only)				
13	Insurance company Fees clause 1.18				
14	Provision of services by the Main contractor clause 1.19				
15	Samples and Materials Generally clause 1.21				
16	Supplies clause 1.20				
17	Bills of Quantities clause 1.23				
SUB-TOTAL CARRIED FORWARD TO NEXT PAGE					

PROPOSED LIBRARY FOR KARATINA UNIVERSITY: STRUCTURED CABLING, IP-PABX, CCTV AND ACCESS CONTROL

ITEM	DESCRIPTION	UNIT	QTY	RATE	KSHS
SUB-TOTAL BROUGHT FORWARD FROM PREVIOUS PAGE					
18	Contractor's Office in Kenya clause 1.24				
19	Builder's Work clause 1.25				
20	Setting to work and Regulating system clause 1.29				
21	Identification of plant components clause 1.30				
22	Working Drawings clause 1.32				
23	Record Drawings(As Installed) and Instructions clause 1.33				
24	Maintenance Manual clause 1.34				
25	Hand over clause 1.35				
26	Painting clause 1.36				
27	Testing and Inspection – manufactured plant clause 1.38				
28	Testing and Inspection – Installation clause 3.39				
29	Storage of Materials clause 1.41				
30	Initial Maintenance clause 1.42				
SUB-TOTAL CARRIED FORWARD TO NEXT PAGE					

PROPOSED LIBRARY FOR KARATINA UNIVERSITY: STRUCTURED CABLING, IP-PABX, CCTV AND ACCESS CONTROL

ITEM	DESCRIPTION	UNIT	QTY	RATE	KSHS
SUB-TOTAL BROUGHT FORWARD FROM PREVIOUS PAGE					
31	Local and other Authorities notices and fees clause 1.60				
32	Temporary Works clause 1.63				
33	Patent Rights clause 1.64				
34	Mobilization and Demobilization Clause 1.65				
35	Supervision by engineer and site meetings clause 1.67				
36	Allow for profit and Attendance for the above (item 35)				
37	Amendment to Scope of Contract Works Clause 1.68				
38	Contractor Obligation and Employers Obligation clause 1.69				
Sub-total from above					
TOTAL CARRIED FORWARD TO PRICE SUMMARY PAGE 109					

STRUCTURED CABLING

ITEM	DESCRIPTION	UNIT	QTY	RATE	TOTAL
	ALL PRICES TO BE IN KSHS				
	<u>QUOTE FOR THE SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF THE FOLLOWING ITEMS</u>				
1.0	<u>GROUND FLOOR</u>				
(A)	<u>HORIZONTAL CABLING</u>				
1.1	Siemon Category 6A angled faceplate, SINGLE port white colour complete with fixing screws or approved equivalent.	No.	24		
1.2	Siemon Category 6A, 4pair stranded UTP 3 metre factory terminated patch cords or approved equivalent. Colour to be selected by client.	No.	9		
1.3	Siemon Category 6A, 4pair stranded UTP 3 metre factory terminated patch cords. One side RJ 45 and the other RJ45 or approved equivalent.	No.	24		
1.4	Siemon Category 6A 4pair, 24 AWG, UTP, 10 ohm cable, must exceed ANSI/TIA/EIA-568-B1 requirement or approved equivalent.	Lm	1,920		
1.5	Siemon Category 6A, 4pair stranded UTP 1meter factory terminated patch cords or Approved equivalent.	No.	24		
1.6	Siemon 24 port category 6A UTP (19".0) patch panel to ANSI/TIA/EIA-568A, colour black or approved equivalent.	No.	1		
1.7	Siemon 48 port category 6A UTP (19".0) patch panel to ANSI/TIA/EIA-568A, colour black or approved equivalent.	No.	-		
1.8	Self adhesive Labels for cable labelling(PACKETS OF 200 LABELS EACH)	Item	1		
(B)	<u>ACTIVE COMPONENTS AND CABINETS</u>				
1.9	42U metal cabinet with a perforated metal door complete 4No fans, power socket 6No, grounding kits and castors and as described in the particular specifications.	No.	1		
1.10	Edge Switch with PoE as described in the particular specifications complete with the necessary licences and all other accessories	No.	1		
1.11	Supply, install and configure wall mounted wireless Access point as described in the particular specification	No.	4		
1.12	Siemon 1U(19".0) horizontal cable managers or approved equivalent.	No.	1		
	TOTAL FOR GROUND FLOOR CARRIED FORWARD TO PRICE COLLECTION PAGE 104				

PROPOSED LIBRARY FOR KARATINA UNIVERSITY: STRUCTURED CABLING, IP-PABX, CCTV AND ACCESS CONTROL

ITEM	DESCRIPTION	UNIT	QTY	RATE	TOTAL
	ALL PRICES TO BE IN KSHS				
	<u>QUOTE FOR THE SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF THE FOLLOWING ITEMS</u>				
2.0	<u>FIRST FLOOR</u>				
(A)	<u>HORIZONTAL CABLING</u>				
2.1	Siemon Category 6A angled faceplate, SINGLE port white colour complete with fixing screws or approved equivalent.	No.	15		
2.2	Siemon Category 6A, 4pair stranded UTP 3 metre factory terminated patch cords or approved equivalent. Colour to be selected by client.	No.	2		
2.3	Siemon Category 6A, 4pair stranded UTP 3 metre factory terminated patch cords. One side RJ 45 and the other RJ45 or approved equivalent.	No.	15		
2.4	Siemon Category 6A 4pair, 24 AWG, UTP, 10 ohm cable, must exceed ANSI/TIA/EIA-568-B1 requirement or approved equivalent.	Lm	1,200		
2.5	Siemon Category 6A, 4pair stranded UTP 1meter factory terminated patch cords or Approved equivalent.	No.	15		
2.6	Siemon 24 port category 6A UTP (19".0) patch panel to ANSI/TIA/EIA-568A, colour black or approved equivalent.	No.	1		
2.7	Siemon 48 port category 6A UTP (19".0) patch panel to ANSI/TIA/EIA-568A, colour black or approved equivalent.	No.	-		
2.8	Self adhesive Labels for cable labelling(PACKETS OF 200 LABELS EACH)	Item	1		
(B)	<u>ACTIVE COMPONENTS AND CABINETS</u>				
2.9	12U metal cabinet with a perforated metal door complete with fans, power socket 6No, grounding kits and castors and as described in the particular specifications.	No.	1		
2.10	Edge Switch with PoE as described in the particular specifications complete with the necessary licences and all other accessories	No.	1		
2.11	Supply, install and configure wall mounted wireless Access point as described in the particular specification	No.	4		
2.12	Siemon 1U(19".0) horizontal cable managers or approved equivalent.	No.	1		
	TOTAL FOR 1ST FLOOR CARRIED FORWARD TO PRICE COLLECTION PAGE 104				

PROPOSED LIBRARY FOR KARATINA UNIVERSITY: STRUCTURED CABLING, IP-PABX, CCTV AND ACCESS CONTROL

ITEM	DESCRIPTION	UNIT	QTY	RATE	TOTAL
	ALL PRICES TO BE IN KSHS				
	<u>QUOTE FOR THE SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF THE FOLLOWING ITEMS</u>				
3.0	<u>SECOND FLOOR</u>				
(A)	<u>HORIZONTAL CABLING</u>				
3.1	Siemon Category 6A angled faceplate, SINGLE port white colour complete with fixing screws or approved equivalent.	No.	20		
3.2	Siemon Category 6A, 4pair stranded UTP 3 metre factory terminated patch cords or approved equivalent. Colour to be selected by client.	No.	7		
3.3	Siemon Category 6A, 4pair stranded UTP 3 metre factory terminated patch cords. One side RJ 45 and the other RJ45 or approved equivalent.	No.	20		
3.4	Siemon Category 6A 4pair, 24 AWG, UTP, 10 ohm cable, must exceed ANSI/TIA/EIA-568-B1 requirement or approved equivalent.	Lm	1,600		
3.5	Siemon Category 6A, 4pair stranded UTP 1meter factory terminated patch cords or Approved equivalent.	No.	20		
3.6	Siemon 24 port category 6A UTP (19".0) patch panel to ANSI/TIA/EIA-568A, colour black or approved equivalent.	No.	1		
3.7	Siemon 48 port category 6A UTP (19".0) patch panel to ANSI/TIA/EIA-568A, colour black or approved equivalent.	No.	-		
3.8	Self adhesive Labels for cable labelling(PACKETS OF 200 LABELS EACH)	Item	1		
(B)	<u>ACTIVE COMPONENTS AND CABINETS</u>				
3.9	12U metal cabinet with a perforated metal door complete with fans, power socket 6No, grounding kits and castors and as described in the particular specifications.	No.	1		
3.10	Edge Switch with PoE as described in the particular specifications complete with the necessary licences and all other accessories	No.	1		
3.11	Supply, install and configure wall mounted wireless Access point as described in the particular specification	No.	6		
3.12	Siemon 1U(19".0) horizontal cable managers or approved equivalent.	No.	1		
	TOTAL FOR 1ST FLOOR CARRIED FORWARD TO PRICE COLLECTION PAGE 104				

PROPOSED LIBRARY FOR KARATINA UNIVERSITY: STRUCTURED CABLING, IP-PABX, CCTV AND ACCESS CONTROL

ITEM	DESCRIPTION	UNIT	QTY	RATE	TOTAL
	ALL PRICES TO BE IN KSHS				
	<u>QUOTE FOR THE SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF THE FOLLOWING ITEMS</u>				
4.0	<u>THIRD FLOOR</u>				
(A)	<u>HORIZONTAL CABLING</u>				
4.1	Siemon Category 6A angled faceplate, SINGLE port white colour complete with fixing screws or approved equivalent.	No.	12		
4.2	Siemon Category 6A, 4pair stranded UTP 3 metre factory terminated patch cords or approved equivalent. Colour to be selected by client.	No.	5		
4.3	Siemon Category 6A, 4pair stranded UTP 3 metre factory terminated patch cords. One side RJ 45 and the other RJ45 or approved equivalent.	No.	12		
4.4	Siemon Category 6A 4pair, 24 AWG, UTP, 10 ohm cable, must exceed ANSI/TIA/EIA-568-B1 requirement or approved equivalent.	Lm	960		
4.5	Siemon Category 6A, 4pair stranded UTP 1meter factory terminated patch cords or Approved equivalent.	No.	12		
4.6	Siemon 24 port category 6A UTP (19".0) patch panel to ANSI/TIA/EIA-568A, colour black or approved equivalent.	No.	1		
4.7	Siemon 48 port category 6A UTP (19".0) patch panel to ANSI/TIA/EIA-568A, colour black or approved equivalent.	No.	-		
4.8	Self adhesive Labels for cable labelling(PACKETS OF 200 LABELS EACH)	Item	1		
(B)	<u>ACTIVE COMPONENTS AND CABINETS</u>				
4.9	12U metal cabinet with a perforated metal door complete with fans, power socket 6No, grounding kits and castors and as described in the particular specifications.	No.	1		
4.10	Edge Switch with PoE as described in the particular specifications complete with the necessary licences and all other accessories	No.	1		
4.11	Supply, install and configure wall mounted wireless Access point as described in the particular specification	No.	4		
4.12	Siemon 1U(19".0) horizontal cable managers or approved equivalent.	No.	1		
	TOTAL FOR 3RD FLOOR CARRIED FORWARD TO PRICE COLLECTION PAGE 104				

PROPOSED LIBRARY FOR KARATINA UNIVERSITY: STRUCTURED CABLING, IP-PABX, CCTV AND ACCESS CONTROL

ITEM	DESCRIPTION	UNIT	QTY	RATE (KSHS)	TOTAL (KSHS)
	<u>QUOTE FOR THE SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF THE FOLLOWING ITEMS</u>				
5.0	<u>FIBER OPTIC INTERLINKS AND BACKBONE CORE SWITCH</u>				
5.1	Supply and install an outdoor 8 core single mode fiber cable to be installed in 100mm diameter HGPVC duct buried 450mm below ground complet with trenching, tilling and backfilling. Cable to link the library to the existing administration block	Lm	1,000		
5.5	Supply and install indoor 8 core single mode fiber cable between floors in the main bulding and between floor cabinets	Lm	320		
5.6	Supply and install fiber trays for each of the cabinets	No	5		
5.7	Core switch complete with all accessories and as described in the particular specifications.	Item	1		
5.8	Supply and install a rack mounted 10KVA Uninterruptible power supply unit.	No	1		
5.9	Supply and install a 5KVA Uninterruptible power supply unit.	No	3		
5.1	Main fiber back bone distribution frame/panel for both the incoming fiber cable and for reticulation. The panel is to be waterproof, complete with all accessories.	Item	1		
1.00	Supply, install, test and commission an IP PABX equipped as described in the technical Specifications	No.	1		
1.01	Supply, install, test and commission a battery set for the IP-P.A.B.X. above complete with inverter and enough capacity to serve all auxiliary equipment linked to the IP-PA.B.X. for a period of minimum 8 hours .	No.	1		
1.02	Supply, install, test and commission an AC Voltage stabilizer for the IP-P.A.B.X. and all auxiliary equipment.	No.	1		
1.03	Provide and independent telecommunication earth to the IP-P.A.B.X	No.	1		
1.04	Supply, Install, Test and commision an MDF suitable for the ultimate size of the IP-PABX Machine above	No.	1		
1.05	Supply, Install, Test and commision a Modem for ISDN PRI for the PABX	No.	1		
5.11	Standard IP telephone instruments complete with telephone cord and termination blocks as described in the technical Specifications	No.	16		
5.12	Executive IP telephone instruments complete with telephone cord and termination block as described in the technical Specifications	No.	7		
	TOTAL FOR 3RD FLOOR CARRIED FORWARD TO NEXT PAGE				

PROPOSED LIBRARY FOR KARATINA UNIVERSITY: STRUCTURED CABLING, IP-PABX, CCTV AND ACCESS CONTROL

ITEM	DESCRIPTION	UNIT	QTY	RATE	KSHS
	SUB-TOTAL BROUGHT FORWARD FROM PREVIOUS PAGE				
5.13	Expansion module for the Secretarial/Operator Sets as described in the technical Specifications	No.	3		
5.14	Labelling and documentation	lot	1		
5.15	Allow for structured cabling termination at all computer terminals, attendance in power connections, testing and commissioning of the network to TSD-ISN standards.	lot	1		
5.16	Grounding and bounding kit complete with 50mm diameter copper bounding bar and 6mm thick green and yellow wire. The Earthing the system is to be to the approval of the Engineer.	Item	1		
5.17	Provide for configuration, testing, setting to work and integration of the new installation to the existing system installation	lot	1		
5.18	Provide for fiber cable testing, preparing and presenting warranty and documentation, cabling layout diagrams, indelible point labels and preparing and submitting individual test results (for each point and for all point to be submitted as a bound report). Attach printed results and soft copy	lot	1		
5.19	Any other items necessary to complete the structured cabling satisfactorily. (List and give quantities of the items)				
	a)..... b)..... c)..... d).....				
	TOTAL FOR FIBER LINKS, BACK BONE CORE SWITCH CARRIED FORWARD TO PRICE COLLECTION PAGE 104				-

PROPOSED LIBRARY FOR KARATINA UNIVERSITY: STRUCTURED CABLING, IP-PABX, CCTV AND ACCESS CONTROL

[illegible]

CCTV INSTALLATIONS

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Kshs)
	Supply, install & program, test and commission the following				
	IP CCTV SURVEILLANCE SYSTEM				
1	CCTV Camera Type 1 complete with mounting brackets and all other accessories and as Specified in the technical specifications	No	12		
2	CCTV Camera Type 2 complete with mounting brackets and all other accessories and as Specified in the technical specifications	No	4		
3	CCTV Camera Type 3 complete with mounting brackets and all other accessories and as Specified in the technical specifications	No	13		
4	CCTV Camera Type 4 complete with mounting brackets and all other accessories and as Specified in the technical specifications	No	4		
5	CCTV Camera Type 5 complete with mounting brackets and all other accessories and as Specified in the technical specifications	No	8		
6	128GB Surveillance SSDD Suitable for Cameras ABOVE	No.	41		
7	PTZ Control Joystick (3-axis twist zoom) s described in the particular specifications		1		
8	24 port switch with PoE as described in the particular specifications complete with the necessary licences and all other accessories.	No.	2		
9	CORE Network Switch as described in the technical Specifications	No.	0		
10	3kVA Rack Mount Inverter INCLUDING Batteries for 8hours operation	No.	1		
11	1kVA Rack Mount Double conversion UPS TRUE online INCLUDING Batteries	No.	1		
12	Multi Mode Fiber Optic 4 Core Cable	LM	50		
13	1 M fiber patch cords:	No.	2		
14	12 Port Fiber Optic Patch Panel	No.	1		
Total C/F to next page					

PROPOSED LIBRARY FOR KARATINA UNIVERSITY: STRUCTURED CABLING, IP-PABX, CCTV AND ACCESS CONTROL

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Kshs)
Total B/F from previous page					
15	SC-SC fibre patch cord	No.	0		
16	FREE STAND CABINET 42U Complete with fans, trays and all other accessories and as Specified in the technical specifications	No.	1		
17	12U Data Cabinet Complete with fans, trays, mounting brackets and all other accessories and as Specified in the technical specifications	No.	0		
18	48- Port CAT6A UTP patch- panel C/w all the necessary accessories.	No.	0		
19	24- Port CAT6A UTP patch- panel C/w all the necessary accessories.	No.	2		
20	CAT6A UTP Cable manager (Organizer) C/w all the necessary accessories.	No.	4		
21	Cat 6A, 4 pair UTP cables.	Lm	2378		
22	CAT 6A UTP Copper 1 M patch cords:	No.	31		
23	Network video recorder (NVR) with 3year warranty complete with CCTVsurveillance recording and management software and all other accessories and as Specified in the technical specifications.	No.	1		
24	8TB Surveillance SATA HDD Suitable for NVR ABOVE	No.	10		
25	Redudant Server storage with 128 tera bytes storage, hot swappable with 10G network connection.	No.	0		
26	4TB 3.5' Hard Disk Drives for Server Above	No.	0		
27	Monitoring client station workstation as described in the particular specifications	No.	1		
28	4K Video Wall Controller	No.	1		
Total C/F to next page					

PROPOSED LIBRARY FOR KARATINA UNIVERSITY: STRUCTURED CABLING, IP-PABX, CCTV AND ACCESS CONTROL

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Kshs)
Total B/F from previous page					
29	40" LED Monitor Display complete with mounting brackets and all other accessories and as Specified in the technical specifications	No.	7		
30	Rectangular skirting trunking Type B of dimensions 150mm×50mm 1 compartment along all walls as indicated in drawing number drg. Trunking to be powder coated and white in colour for the riser to the floors from the server room	Lm	0		
31	Rectangular skirting trunking Type B of dimensions 50mm×50mm 1 compartment along all walls as indicated in drawing number drg. Trunking to be powder coated and white in colour for the riser to the floors from the server room	Lm	0		
32	LOCAL Training (User & Operator) for No. 10 person(s).	Sum	1		
33	Any other item necessary to complete installation in this section (Please itemize) a) b) c) d)	Lot	Item		
Total for CCTV installation C/F to Summary Page 109					

ACCESS CONTROL INSTALLATIONS

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Kshs)
34	Door input controller interface unit with twenty input and two output as described in particular specifications	6	No.		
35	Two door controller as specified in particular specifications	6	No.		
36	A 300Kg- Force magnetic door lock	6	No.		
37	Door Reader with biometric (Finger) and proximity card reader and complete with keypad and USB port as specified in particular specifications	9	No.		
38	Emergency Break glass	6	No.		
39	Override Key Switch	6	No.		
40	Sturdy Exit Button Switch	3	No.		
41	Category 6A, 4Pair, STP Cable and as Siemon 9A6LA-A5/USA or Approved Equivalent	390	M		
42	Provide power for access controller module from the exissting UPS power source	1	item		
43	Proximity card with RFID the individual / client's details as specified in particular specifications item 3.03.	10	No.		
44	EBI software including Tema Module	1	No.		
45	Software module for Access control integrated with Building Management system	0	No.		
46	Computer complete with a printer as specified in particular specifications	1	No.		
47	Access control server controller as specified in particular specifications	1	No.		
48	Wire the entire access control system using 12 core 2.5mm ² fire resistant cable.	1	lot		
49	Allow complete with the sytem software, configuration, full graphic customization and programming of the installed system.	1	Lot		
Total for Access Control Installation C/F to Summary Page 109					-

SUMMARY PAGE

Item	Description	AMOUNT (KSHS)
1	Total for Preliminaries	
2	Total for Structured Cabling and IP-PABX Installations	
3	Total for CCTV Installations	
4	Total for Access Control Installations	
5	Provisional sum as contingency	1,000,000.00
	Grant Total (incl. VAT where applicable) carried to Form of Tender in KShs.	

TOTAL AMOUNT IN WORDS : - Kenya Shillings

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Tenderer’s Name and Stamp

.....
.....

Signature Date.....

PIN No VAT Certificate No.

Witness..... Address.....

Signature of Witness.....Date.....