COMMUNICATIONS AUTHORITY OF KENYA

RE-TENDER FOR THE ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT SYSTEM AT CA HEADQUARTERS, ELDORET AND MOMBASA REGIONAL OFFICES

TENDER NO. CA/PROC/OT/38/2016/2017

Client:
Communications Authority of Kenya,
P. O. Box 14448-00800,
NAIROBI.

Consultants/Engineer:
EMpaq Limited,
Consulting Engineers
P. O. Box 68140-00200,
NAIROBI.

APRIL, 2017

COMMUNICATIONS AUTHORITY OF KENYA
ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT SYSTEM AT CA HEADQUARTERS, ELDORET AND MOMBASA REGIONAL OFFICES

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EMpaq Limited,
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April, 2017

SECTION I : INVITATION FOR TENDERS

Tender No: **CA/PROC/OT/38/2016-17**

Tender Name: **RE-TENDER FOR THE ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT SYSTEM**

Communications Authority of Kenya invites sealed tenders from eligible candidates for the **re-tender for the access control system/integration with staff/visitor management system**

Interested Contractors who must be qualified and registered with the ñ**National Construction Authority (NCA) – Category 3 and above**, should obtain the tender documents from **Communications Authority of Kenya Centre, Procurement Office, 3rd Floor wing A** along Waiyaki Way, Nairobi, during normal working hours.

The tender documents can also be accessed and downloaded from the IFMIS Supplier Portal: http://supplier.treasury.go.ke and the Authorityôs website: www.ca.go.ke**.** The firms that download the document must arrange to forward their particulars/contacts to the Head of Procurement, Communications Authority of Kenya, through email address tenders@ca.go.ke before the closing date for records and for the purposes of receiving clarifications and/or addendums, if any. The tender documents will be issued free of charge.

Bidders are advised that the site visit is mandatory on **19th April, 2017 at 11.00. a.m** at CA Centre, Waiyaki Way.

Prices quoted must be net inclusive of VAT and all Government Taxes and must remain valid for one hundred and twenty (120) days from the opening date of the tender.

Completed tender documents in plain, sealed envelope clearly marked- **CA/PROC/OT/38/2016-2017 -ñRe- tender for the access control system/integration with staff/visitor management system"** should be deposited in our tender box located on the ground floor of the CA Centre and addressed as shown below, so as to reach on or before **3rd May, 2017 at 2.30 p.m.**

The Head of Procurement,
Communications Authority of Kenya,
P.O. Box 14448,
Nairobi 00800.
Tel: 4242000/0703-042000
Mobile: 0736 121515/ 121414
0727 531278/531279
E-mail: tenders@ca.go.ke
Website: www.ca.go.ke

Bids will be opened thereafter in the presence of bidderôs representatives who chose to attend on **3rd May, 2017 at 2.30 p.m.** at the 1st floor meeting room 2.

DEFINITIONS

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

Client:	Communications Authority of Kenya, P. O. Box 14448-00800, NAIROBI.
Consultants/Engineer:	EMpaq Limited, Consulting Engineers, P. O. Box 68140-00200, NAIROBI.
Client Representative:	EMpaq Limited, Consulting Engineers, P. O. Box 68140-00200, NAIROBI.

PART A:

INSTRUCTIONS TO TENDERERS

INSTRUCTIONS TO TENDERERS

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INSTRUCTION TO TENDERERS

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

GENERAL

1. Definitions

(a) ñ**Tenderer"** means any person or persons partnership firm or company submitting a sum or sums in the Bills of Quantities in accordance with the Instructions to Tenderers, Conditions of Contract, Specifications, Drawings and Bills of Quantities for the work contemplated, acting directly or through a legally appointed representative.

(b) **"Approved tenderer**,ò means the tenderer who is approved by the Employer.

(c) Any noun or adjective derived from the word **"tender"** shall be read and construed to mean the corresponding form of the noun or adjective **"bid".** Any conjugation of the verb ñtenderò shall be read and construed to mean the corresponding form of the verb ñbid.ò

(d) **Employer"** means **Communications Authority of Kenya, P O Box 14448-00800, Nairobi, and Tel: 0703-042000**

2. Eligibility and Qualification Requirements

2.1 This invitation to tender is open to all tenderers who have been pre-qualified.

2.2 To be eligible for award of Contract, the tenderer shall provide evidence satisfactory to the Employer of their eligibility under Sub clause 2.1 above and of their capability and adequacy of resources to effectively carry out the subject Contract. To this end, the tenderer shall be required to update the following information already submitted during pre-qualification:-

(a) Details of experience and past performance of the tenderer on the works of a similar nature within the past five years and details of current work on hand and other contractual commitments.

(b) The qualifications and experience of key personnel proposed for administration and execution of the contract, both on and off site.

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

(d) Details of subcontractors to whom it is proposed to sublet any portion of the Contract and for whom authority will be requested for such subletting.

(e) A draft Program of Works in the form of a bar chart and Schedule of Payment which shall form part of the Contract if the tender is accepted. Any change in the Program or Schedule shall be subjected to the approval of the Engineer. The program of works must be presented in detail, to include all milestones from commencement to commissioning, and handing over.

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

2.3 Joint Ventures

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

(a) The tender, and in case of a successful tender, the Form of Agreement, shall be signed so as to be legally binding on all partners.

(b) One of the partners shall be nominated as being in charge; and this authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the partners.

(c) The partner in charge shall be authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the joint venture and the entire execution of the Contract including payment shall be done exclusively with the partner in charge.

(d) All partners of the joint venture shall be liable jointly and severally for the execution of the Contract in accordance with the Contract terms, and a relevant statement to this effect shall be included in the authorization mentioned under (b) above as well as in the Form of Tender and the Form of Agreement (in case of a successful tender).

(e) A copy of the agreement entered into by the joint venture partners shall be submitted with the tender.

3. Cost of Tendering

The tenderer shall bear all costs associated with the preparation and submission of his tender and the Employer will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the tendering process.

4. **Site Visit/Pre Bid Conference - CA Centre Only**

4.1 The tenderer is advised that there will be **a mandatory** pre-bid conference/ site visit and examine the site and its surroundings and obtain for himself on his own responsibility, all information that may be necessary for preparing the tender and entering into a Contract. The costs of visiting the site shall be the tendererôs own responsibility.

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

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

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

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

TENDER DOCUMENTS

5. Tender Documents

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

a. Special Notes for all Tenderers
b. Form of Tender
c. Form of tender Security: Bank
d. Form of tender Security: Insurance Company
e. Form of Undertaking
f. Definitions
g. Instructions to Tenderers
h. Conditions of Contract
i. Preliminaries and General Conditions
j. Technical Specifications for Communications Services
k. Technical Specifications for Security Management System
l. Bills of Quantities and Schedule of Unit Rates
m. Full service maintenance per year after expiry of defects liability period
n. Technical Schedule of Items Supplied
o. Standard Forms

5.2 The tenderer is expected to examine carefully all instructions, conditions, forms, terms, specifications and drawings in the tender documents. Failure to comply with the requirements for tender submission will be at the Tendererôs own risk. Pursuant to clause 23 of Instructions to Tenderers, tenders which are not substantially responsive to the requirements of the tender documents will be rejected.

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

6. Clarification of Tender Documents

6.1 A prospective tenderer requiring any clarification of the tender documents may notify the Employer in writing or by telex, cable or facsimile at the Employerôs mailing address indicated in the Invitation to Tender. The Employer will respond in writing to any request for clarification, which he receives earlier than 7 days prior to the deadline for the submission of tenders. Written copies of the Employerôs response (including the query but without identifying the source of the inquiry) will be sent to all prospective tenderers who have purchased the tender documents.

7. Amendment of Tender Documents

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

7.2 Any Addendum will be notified in writing or by cable, telex or facsimile to all prospective tenderers who have purchased the tender documents and will be binding upon them.

7.3 If during the period of tendering, any circular letters (tender notices) shall be issued to tenderers by, or on behalf of, the Employer setting forth the interpretation to be placed on a part of the tender documents or to make any change in them, such circular letters will form part of the tender documents and it will be assumed that the tenderer has taken account of them in preparing his tender. The tenderer must promptly acknowledge any circular letters he may receive.

7.4 In order to allow prospective tenderers reasonable time in which to take the Addendum into account in preparing their tenders, the Employer may, at his discretion, extend the deadline for the submission of tenders.

PREPARATION OF TENDERS

8. Language of Tender

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

9. Documents Comprising the Tender

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

10. Tender Prices

10.1 All the insertions made by the tenderer shall be made in INK and the tenderer shall clearly form the figures. The relevant space in the Form of Tender and Bills of Quantities shall be completed accordingly without interlineations or erasures except those necessary to correct errors made by the tenderer in which case the erasures and interlineations shall be initialed by the person or persons signing the tender.

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

The prices and unit rates in the Bills of Quantities are to be the full [all-inclusive] value of the work described under the items, including all costs and expenses which may be necessary and all general risks, liabilities and obligations set forth or implied in the documents on which the tender is based. All duties and taxes and other levies payable by the Contractor under the Contract or for any other cause as of the date 7 days prior to the deadline for the submission of tenders, shall be included in the rates and prices and the total tender prices submitted by the Tenderer. Such duties to include import duty, Value Added Tax (VAT), local authority (levies) and any other taxes (levies that may be imposed by the government and/or local authorities.

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

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

10.3 Unless otherwise specified the tenderer must enter the amounts representing 10% of the sub-total of the summary of the Bills of Quantities for Contingencies and Variation of Prices [V.O.P.] payments in the summary sheet and add them to the sub-total to arrive at the tender amount.

10.4 The tenderer shall furnish with his tender written confirmation from his suppliers or manufacturers of unit rates for the supply of items listed in the Conditions of Contract where appropriate.

10.5 The rates and prices quoted by the tenderer are subject to adjustment during the performance of the Contract only in accordance with the provisions of the Conditions of Contract. The tenderer shall complete the schedule of basic rates and shall submit with his tender such other supporting information as required under the Conditions of Contract.

11. Currencies of Tender and Payment

11.1 Tenders shall be priced in Kenya Shillings and the tender sum shall be in Kenya Shillings.

11.2 Tenderers are required to indicate in the Statement of Foreign Currency Requirements, which forms part of the tender, the foreign currency required by them. Such currency should generally be the currency of the country of the Tendererôs main office. However, if a substantial portion of the Tendererôs expenditure under the Contract is expected to be in countries other than his country of origin, then he may state a corresponding portion of the Contract price in the currency of those other countries. However, the foreign currency element is to be limited to two (2) different currencies and a maximum of 30% (thirty percent) of the Contract Price.

11.3 The rate of exchange used for pricing the tender shall be selling rate or rates of the Central Bank ruling on the date seven (7) days before the final date for the submission of tenders.

11.4 Tenderers must enclose with their tenders, a brief justification of the foreign currency requirements stated in their tenders.

12. **Tender Validity**

12.1 The tender shall remain valid and open for acceptance for a period of one hundred and twenty (120) days from the specified date of tender opening or from the extended date of tender opening (in accordance with clause 7.4 here above) whichever is the later.

12.2 In exceptional circumstances prior to expiry of the original tender validity period, the Employer may request the tenderer for a specified extension of the period of validity. The request and the responses thereto shall be made in writing or by cable, telex or facsimile. A tenderer may refuse the request without forfeiting his Tender Surety. A tenderer agreeing to the request will not be required nor permitted to modify his tender, but will be required to extend the validity of his Tender Surety correspondingly.

13. **Tender Surety**

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

13.2 The unconditional Tender Surety shall be in Kenya Shillings and be in form of guarantee from a reputable Bank or from an Insurance Company approved by Insurance Regulatory Authority or Public Procurement Regulatory Authority (PPRA).

The format of the Surety shall be in accordance with the sample form of Tender Surety included in these tender documents; other formats may be permitted subject to the prior approval of the Employer. The Tender Surety shall be valid for thirty (30) days beyond the tender validity period.

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

13.4 The Tender Sureties of unsuccessful tenderers will be returned as promptly as possible, but not later than twenty eight (28) days after concluding the Contract execution and after a Performance Security has been furnished by the successful tenderer. The Tender Surety of the successful tenderer will be returned upon the tenderer executing the Contract and furnishing the required Performance Security.

13.5 The Tender Surety may be forfeited:

(a) if a tenderer withdraws his tender during the period of tender validity: or

(b) in the case of a successful tenderer, if he fails
(i) to sign the Agreement, or
(ii) to furnish the necessary Performance Security

(c) if a tenderer does not accept the correction of his tender price pursuant to clause 24.

14. **No Alternative Offers**

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

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

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

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

15 Pre-Tender Meeting (Site Meeting will be done at CA Centre)

15.1 The tendererôs designated representative is invited to attend a pre-tender meeting, which if convened, will take place at the venue and time stated in the Invitation to Tender. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

15.2 The tenderer is requested as far as possible to submit any questions in writing or by cable, to reach the Employer not later than seven days before the meeting. It may not be practicable at the meeting to answer questions received late, but questions and responses will be transmitted in accordance with the following:

(a) Minutes of the meeting, including the text of the questions raised and the responses given together with any responses prepared after the meeting, will be transmitted without delay to all purchasers of the tender documents. Any modification of the tender documents listed in -ï Clause 9 which may become necessary as a result of the pre-tender meeting shall be made by the Employer exclusively through the issue of a tender notice pursuant to Clause 7 and not

through the minutes of the pre-tender meeting.

(b) Non attendance at the pre-tender meeting will not be cause for disqualification of a bidder.

16 Format and Signing of Tenders

16.1 The tenderer shall prepare his tender as outlined in clause 9 above and mark appropriately one set ñORIGINALò and the other ñCOPYò.

16.2 The copy of the tender and Bills of Quantities shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the tenderer. Proof of authorization shall be furnished in the form of the written power of attorney, which shall accompany the tender. All pages of the tender where amendments have been made shall be initialed by the person or persons signing the tender.

16.3 The complete tender shall be without alterations, interlineations or erasures, except as necessary to correct errors made by the tenderer, in which case such corrections shall be initialed by the person or persons signing the tender.

SUBMISSION OF TENDERS

17 Sealing and Marking of Tenders

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

17.2 The inner and outer envelopes shall be addressed to the Employer at the address stated in the Appendix to Instructions to Tenderers and bear the name and identification of the Contract stated in the said Appendix with a warning not to open before the date and time for opening of tenders stated in the said Appendix.

17.3 The inner envelopes shall each indicate the name and address of the tenderer to enable the tender to be returned unopened in case it is declared ñlateò, while the outer envelope shall bear no mark indicating the identity of the tenderer.

17.4 If the outer envelope is not sealed and marked as instructed above, the Employer will assume no responsibility for the misplacement or premature opening of the tender. A tender opened prematurely for this cause will be rejected by the Employer and returned to the tenderer.

18**. Deadline for Submission of Tenders**

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

Tenders delivered by hand must be placed in the ñtender boxò provided in the office of the Employer.

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

18.2 The Employer may, at his discretion, extend the deadline for the submission of tenders through the issue of an Addendum in accordance with clause 7, in which case all rights and obligations of the Employer and the tenderers previously subject to the original deadline shall thereafter be subject to the new deadline as extended.

18.3 Any tender received by the Employer after the prescribed deadline for submission of tender will be returned unopened to the tenderer.

19. **Modification and Withdrawal of Tenders**

19.1 The tenderer may modify or withdraw his tender after tender submission, provided that written notice of the modification or withdrawal is received by the Employer prior to prescribed deadline for submission of tenders.

19.2 The Tendererôs modification or withdrawal notice shall be prepared, sealed, marked and dispatched in accordance with the provisions for the submission of tenders, with the inner and outer envelopes additionally marked ñMODIFICATIONò or ñWITHDRAWALò as appropriate.

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

19.4 No tender may be withdrawn in the interval between the deadline for submission of tenders and the period of tender validity specified on the tender form. Withdrawal of a tender during this interval will result in the forfeiture of the Tender Surety.

19.5 Subsequent to the expiration of the period of tender validity prescribed by the Employer, and the tenderer having not been notified by the Employer of the award of the Contract or the tenderer does not intend to conform with the request of the Employer to extend the prior of tender validity, the tenderer may withdraw his tender without risk of forfeiture of the Tender Surety.

TENDER OPENING AND EVALUATION

20. Tender Opening

20.1 The Employer will open the tenders in the presence of the tenderersô representatives who choose to attend at the time and location indicated in the Letter of Invitation to Tender. The tenderersô representatives who are present shall sign a register evidencing their attendance.

20.2 Tenders for which an acceptable notice of withdrawal has been submitted, pursuant to clause 19, will not be opened. The Employer will examine the tenders to determine whether they are complete, whether the requisite Tender Sureties have been furnished, whether the documents have been properly signed and whether the tenders are generally in order.

20.3 At the tender opening, the Employer will announce the Tendererôs names, total tender price, tender price modifications and tender withdrawals, if any, the presence of the requisite Tender Surety and such other details as the Employer, at his discretion, may consider appropriate. No tender shall be rejected at the tender opening except for late tenders.

20.4 The Employer shall prepare minutes of the tender opening including the information disclosed to those present.

20.5 Tenders not opened and read out at tender opening shall not be considered further for evaluation, irrespective of the circumstances.

21 Process to be Confidential

21.1 After the public opening of tenders, information relating to the examination, clarification, evaluation and comparisons of tenders and recommendations concerning the award of Contract shall not be disclosed to tenderers or other persons not officially concerned with such process until the award of Contract is announced.

21.2 Any effort by a tenderer to influence the Employer in the process of examination, evaluation and comparison of tenders and decisions concerning award of Contract may result in the rejection of the Tendererôs tender.

22 Clarification Tenders

22.1 To assist in the examination, evaluation and comparison of tenders, the Employer may ask tenderers individually for clarification of their tenders, including breakdown of unit prices. The request for clarification and the response shall be in writing or by cable, facsimile or telex, but no change in the price or substance of the tender shall be sought, offered or permitted except as required to confirm the correction of arithmetical errors discovered by the employer during the evaluation of the tenders in accordance with clause 24.

22.2 No Tenderer shall contact the Employer on any matter relating to his tender from the time of the tender opening to the time the Contract is awarded. If the tenderer wishes to bring additional information to the notice of the Employer, he shall do so in writing.

23 Determination of Responsiveness

23.1 Prior to the detailed evaluation of tenders, the Employer will determine whether each tender is substantially responsive to the requirements of the tender documents.

23.2 For the purpose of this clause, a substantially responsive tender is one, which conforms to all the terms, conditions and specifications of the tender documents without material deviation or reservation and has a valid bank guarantee. A material deviation or reservation is one which affects in any substantial way the scope, quality, completion timing or administration of the Works to be undertaken by the tenderer under the Contract, or which limits in any substantial way, inconsistent with the tender documents, the Employerôs rights or the tenderers obligations under the Contract and the rectification of which would affect unfairly the competitive position of other tenderers who have presented substantially responsive tenders.

23.3 Each price or unit rate inserted in the Bills of Quantities shall be a realistic estimate of the cost of completing the works described under the particular item including allowance for overheads, profits and the like. Should a tender be seriously unbalanced in relation to the Employerôs estimate of the works to be performed under any item or groups of items, the tender shall be deemed not responsive.

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

24 Conversion to Single Currency

24.1 For compensation of tenders, the tender price shall first be broken down into the respective amounts payable in various currencies by using the selling rate or rates of the Central Bank of Kenya ruling on the date seven (7) days before the final date for the submission of tenders.

24.2 The Employer will convert the amounts in various currencies in which the tender is payable (excluding provisional sums but including Day-works where priced competitively) to Kenya Shillings at the selling rates stated in clause 24.1.

25 Evaluation and Comparison of Tenders

25.1 The Employer will evaluate only tenders determined to be substantially responsive to the requirements of the tender documents in accordance with clause 23.

25.2 In evaluating tenders, the Employer will determine for each tender the evaluated tender price by adjusting the tender price as follows:

(a) Making any correction for errors pursuant to clause 24.

(b) Excluding Provisional Sums and provision, if any, for Contingencies in the Bills of Quantities, but including Day works where priced competitively.

25.3 The Employer reserves the right to accept any variation, deviation or alternative offer. Variations, deviations, alternative offers and other factors which are in excess of the requirements of the tender documents or otherwise result in the accrual of unsolicited benefits to the Employer, shall not be taken into account in tender evaluation.

25.4 Price adjustment provisions in the Conditions of Contract applied over the period of execution of the Contract shall not be taken into account in tender evaluation.

25.5 If the lowest evaluated tender is seriously unbalanced or front loaded in relation to the Employerôs estimate of the items of work to be performed under the Contract, the Employer may require the tenderer to produce detailed price analyses for any or all items of the Bills of Quantities, to demonstrate the relationship between those prices, proposed construction methods and schedules. After evaluation of the price analyses, the Employer may require that the amount of the Performance Security set forth in clause 29 be increased at the expense of the successful tenderer to a level sufficient to protect the Employer against financial loss in the event of subsequent default of the successful tenderer under the Contract.

25.6 Firms incorporated in Kenya where indigenous Kenyans own 51% or more of the share capital shall be allowed a 10% preferential bias provided that they do not Contract work valued at more than 50% of the Contract Price excluding Provisional Sums to a non-indigenous Contractor.

AWARD OF CONTRACT

26 Award

26.1 Subject to clause 27.2, the Employer will award the Contract to the tenderer whose tender is determined to be substantially responsive to the tender documents and who has offered the lowest evaluated tender price subject to possessing the capability and resources to effectively carry out the Contract Works.

26.2 The Employer reserves the right to accept or reject any tender, and to annual the tendering process and reject all tenders, at any time prior to award of Contract, without thereby incurring any liability to the affected tenderers or any obligation to inform the affected tenderers of the grounds for the Employerôs action.

27 Notification of Award

27.1 Prior to the expiration of the period of tender validity prescribed by the Employer, the Employer will notify the successful tenderer by cable, telefax or telex and confirmed in writing by registered letter that his tender has been accepted. This letter (hereinafter and in all Contract documents called ñLetter of Acceptanceò) shall name the sum (hereinafter and in all Contract documents called ñthe Contract Priceò) which the Employer will pay to the Contractor in consideration of the execution and completion of the Works as prescribed by the Contract.

27.2 Notification of award will constitute the formation of the Contract.

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

27.4 Within Fourteen [14] days of receipt of the form of Contract Agreement from the Employer, the successful tenderer shall sign the form and return it to the Employer together with the required Performance Security.

28 Performance Guarantee

28.1 Within Fourteen [14] days of receipt of the notification of award from the Employer, the successful tenderer shall furnish the Employer with a Performance Security in an amount stated in the Appendix to Instructions to Tenderers.

28.2 The Performance Security to be provided by the successful tenderer shall be an unconditional Bank Guarantee issued at the Tendererôs option by an established and a reputable Bank approved by the Employer and located in the Republic of Kenya and shall be divided into two elements namely, a performance security payable in foreign currencies and a performance security payable in Kenya Shillings. The value of the two securities shall be in the same proportions of foreign and local currencies as requested in the form of foreign currency requirements. The security will be at the rate of 5% of the tender sum

28.3 Failure of the successful tenderer to lodge the required Performance Security shall constitute a breach of Contract and sufficient grounds for the annulment of the award and forfeiture of the Tender Security and any other remedy under the Contract. The Employer may award the Contract to the next ranked tenderer.

29 Advance Payment

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

APPENDIX TO INSTRUCTIONS TO TENDERERS

1.CLAUSE 2.1

Change to read ñThis invitation Tender is open to all tenderers in the Category Specifiedò.

2. OMIT

Clauses 11.2, 11.4

3. ADD TO CLAUSE 13.1 and 13.2

Tender surety will be required and the Tender Security shall be **Ksh. 500,000.00** and be valid for a period 150 days from closing date.

4. CLAUSES 16.1 and 16.2

Only one set of tender document shall be submitted.

5. CLAUSE 9.1

Appendix to Form of Tender to be omitted.

6. CLAUSE 19.2

Only the single tender document should be marked ñWITHDRAWALò OR ñMODIFICATIONò

7. CLAUSE 30

The Advance Payment Guarantee shall be in Kenya Shillings Only.

8. CLAUSE 16.1, 16.2, 17.1, and 17.2

Only one set of tender documents, filled in INK, shall be submitted.

9. ADD TO CLAUSE 28.1

Amount of performance security will be Five per cent (5%) of Contract sum and bound to the Client

10. ADD TO CLAUSE 28.2

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

TENDER EVALUATION CRITERIA

After tender opening, the tenders will be evaluated in 3 stages, namely:

1. Preliminary and Technical Capacity
2. Detailed Technical Evaluation
3. Financial Evaluation.

STAGE 1- DETERMINATION OF RESPONSIVENESS

A) PRELIMINARY EVALUATION

This stage of evaluation shall involve examination of the pre-qualification conditions as set out in the Tender Advertisement Notice or Letter of Invitation to Tender and any other conditions stated in the bid document.

Evaluation will be done basing on the following parameters:

No	Description of requirement	Pass	Fail
1	Certificate of Registration/Incorporation		
2	Registered with ñNational Construction Authority (NCA) ï **Category 3** and above.		
3	Valid Tax Compliance Certificate.		
4	The Bid Bond of **Kshs 500,000.00** must be in form of Bank Guarantee from a reputable bank or an Insurance Bond from Insurance Company and approved by Public Procurement Regulatory Authority (PPRA) valid for a period of 150 days.		
5	Provision of affidavits as indicated below: • Sworn Anti-Corruption Affidavit; • Signed Power of Attorney to Sign Tender Documents; • Declaration of not being debarred and Litigation history .if no litigation, please indicate		
6	Affidavits of ownership and availability for the assignment by the Foreman/Supervisor.		
7	Audited accounts for the last 2 years (2014 and 2015).		
8	Signed pre-bid site meeting/visit Certificates (CA Centre Only)		
9	Duly filled, signed and stamped Form of Tender		
10	CR 12		
11	Duly filled, signed and stamped Confidential Business Questionnaire		
12	Requirement of continuous serialization of all pages for each bid submitted (both Original and copy)		

Note: The employer may seek further clarification/confirmation if necessary to confirm authenticity/compliance of any condition of the tender.

The tenderers who do not satisfy any of the above requirements shall be considered Non-Responsive and their tenders will not be evaluated further

B) TECHNICAL CAPACITY EVALUATION

The tender document shall be examined based on clause 2.2 of the Instruction to Tenderers which states as follows:

In accordance with clause 2.2 of Instruction to Tenderers, the tenderers will be required to provide evidence for eligibility of the award of the tender by satisfying the employer of their eligibility under sub clause 2.1 of Instruction to Tenderers and adequacy of resources to effectively carry out the subject contract. The tenderers shall be required to fill the Standards Forms provided for the purposes of providing the required information. The tenderers may also attach the required information if they so desire.

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

	PARAMETER	**MAXIMUM POINTS**
(i)	Tender Questionnaire	5
(ii)	Key personnel -	20
(iii)	Contract Completed in the last Five (5) years	15
(iv)	Schedules of on-going projects	10
(v)	Schedules of contractors equipment	10
(vi)	Audited Financial Report for the last 2 years	5
(vii)	Evidence of Financial Resources	5
(viii)	Name, Address and Telephone of Banks **(**Contractor to provide**)**	5
(ix)	Sanctity of the tender document as in accordance with clause 5 of instruction to tenderer	5
(x)	Health and Safety Plan	5
(xi)	Work Programme	15
	TOTAL	**100**

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

TABLE 1

Item	Description	Point Scored	Max. Point	
i	**Tender Questionnaire Form** o Completely filled ---------- 5 o Partially filled ---------- 3 o Not filled ---------- 0		**5**	
ii	**Key Personnel (Attach evidence)**			**20**
	Director of the firm o Holder of degree or diploma in relevant Engineering field----- 5 o Holder of certificate in relevant Engineering field---------- 4 o Holder of trade test certificate in relevant Engineering field-- 3 o No relevant certificate ---------- 0		**5**	
	At least 1No. degree/diploma of key personnel in relevant Engineering field o With over 10 years relevant experience---------- 5 o With over 5 years relevant experience---------- 3 o With under 5 years relevant experience ---------- 1		**5**	
	At least 1No certificate holder of key personnel in relevant Engineering field o With over 10 years relevant experience---------- 5 o With over 5 years relevant experience ---------- 3 o With under 5 years relevant experience ---------- 1		**5**	
	At least 2No artisan (trade test certificate in relevant Engineering field) o Artisan with over 10 years relevant experience---------- 2.5 o Artisan with under 10 years relevant experience ---------- 2 o Non skilled worker with over 10 years relevant experience --- 1		**5**	
iii	**Contract completed in the last five (5) years (At least 3 No. Projects)** o Project of similar nature, complexity and magnitude ---------- 5 o Project of similar nature but of lower value than the one in consideration---------- 2 o No completed project of similar nature ---------- 0 ***Attach LPOs/Contracts, Completion Certificates and Recommendation Letters for the three projects**		**15**	
iv	**On-going projects (At least 2 No. Projects)** o Project of similar nature, complexity and magnitude ---------- 5 o Project of similar nature but of lower value than the one in consideration ï ---------- 2 o No ongoing project of similar nature - ---------- 0 ***Attach LPOs/Contracts, Completion Certificates and Recommendation Letters for the two projects**		**10**	

Item	Description	Point Scored	Max. Point	
V	**Schedule of contractors equipment and transport (proof or evidence of ownership)** o Means of transport (Vehicle) ---------- 4 o No means of transport ---------- 0		4	**10**
	For each specific equipment required in the installation of the Work being tendered for. (Maximum No. of equipment to be considered ï 3 No.---------- 2		6	
vi	**Financial report** **Audited financial report (last two (2) years)** o Turn over greater or equal to Ksh. 180 M ---------- 5 o Turn over greater or equal to Ksh. 120 M ---------- 3 o Turn over greater or equal to Ksh. 60 M ---------- 2 o Turn over below Ksh. 60 M ---------- 1		**5**	
vii	**Evidence of Financial Resources (cash in hand, lines of credit, over draft facility etc)** o Has financial resources equal or above Ksh. 70 M ---------- 5 o Has financial resources below Ksh. 70 M ---------- 3 o Has not indicated sources of financial resources ---------- 0		**5**	
viii	**Name, Address and Telephone of Banks (Contractor to provide)** o Provided ---------- 5 o Not provided ---------- 0		**5**	
ix	**Sanctity of the tender document** o Having the document intact (not tempered with in any way) ---- 2 o Having mutilated or modified the tender document---------- 0		**5**	
x	**Health and Safety Plan (Provide Safety Policy and Plan)** o Provided ---------- 5 o Not provided ---------- 0		**5**	
xi	Detailed Work Programme and methodology on how to handle the project covering the intended duration of the project.		**15**	
	TOTAL		**100**	

Any bidder who scores 75 points and above shall be considered for further evaluation

NOTE

The client at his discretion may carry out a due diligence exercise to verify any information submitted by a bidder. Any information found to be contrary during due diligence to what had been submitted and evaluated, will lead to disqualification of the bidder/s and hence will not be eligible for further evaluation.

STAGE 2 - TECHNICAL EVALUATION

COMPLIANCE WITH TECHNICAL SPECIFICATIONS

In this section, the bid will be analyzed to determine compliance with General and Particular technical specifications for the works as indicated in the tender document.

The tenderer shall fill in the Technical Schedule as specified in the tender document for Equipment and Items indicating the Country of Origin, Model/Make/Manufacturer of the Item/Equipment they propose to supply. **This will be on pass/fail basis**.

Where the Equipment proposed by the tenderer differs with the models specified in the tender document, it is mandatory that the brochures/catalogues of the same be submitted with the tender document highlighting the catalogues Numbers 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:

a) Standards of manufacture
b) Performance ratings/characteristics
c) Material of manufacture
d) Electrical power ratings and
e) Attach certificate of Authorization from the Manufacturer to sell and service the equipment in Kenya
f) Any other necessary requirements (Specify)

Following the above analyses, where the proposed equipment are found not to satisfy the specifications, the tender will be deemed Non – Responsive and will not be evaluated further.

STAGE 3 - FINANCIAL EVALUATION

The lowest evaluated bid will be considered for the award of the Tender

PART B:

CONDITIONS OF CONTRACT

PART B: CONDITIONS OF CONTRACT

PART B: CONDITIONS OF CONTRACT

1. Definitions

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

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

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

"The Completion Date" means the date of completion of the Works as certified by the Employerôs Representative.

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

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

"The Contractor's Tender" is the completed tendering document submitted by the Contractor to the Employer.

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

"Days" are calendar days; **"Months"** are calendar months.

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

"The Defects Liability Certificate" is the certificate issued by Employerôs Representative upon correction of defects by the Contractor.

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

"Drawings" include calculations and other information provided or approved by the Employerôs Representative for the execution of the Contract.

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

"Equipment" is the Contractorôs machinery and vehicles brought temporarily to the Site for the execution of the Works.

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

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

"Employer's Representative" is the person appointed by the Employer and notified to the Contractor for the purpose of supervision of the Works.

"Specification" means the Specification of the Works included in the Contract.

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

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

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

"A Variation" is an instruction given by the Employerôs Representative which varies the Works.

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

2. Contract Documents

2.1 The following documents shall constitute the Contract documents and shall be interpreted in the following order of priority;
(1) Agreement,
(2) Letter of Acceptance,
(3) Contractorôs Tender,
(4) Conditions of Contract,
(5) Specifications,
(6) Drawings,
(7) Bills of Quantities or Schedule of Rates [whichever is applicable]

3. Employer's Representative's Decisions

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

4. Works, Language and Law of Contract

4.1 The Contractor shall construct and install the Works in accordance with the Contract documents. The Works may commence on the Start Date and shall be carried out in accordance with the Programme submitted by the Contractor, as updated with the approval of the Employerôs Representative, and complete them by the Intended Completion Date.

4.2 The ruling language of the Contract shall be English language and the law governing the Contract shall be the law of the Republic of Kenya.

5. Safety, Temporary Works and Discoveries

5.1 The Contractor shall be responsible for design of temporary works and shall obtain approval of third parties to the design of the temporary works where required.

5.2 The Contractor shall be responsible for the safety of all activities on the Site.

5.3 Anything of historical or other interest or significant value unexpectedly discovered on the Site shall be the property of the Employer. The Contractor shall notify the Employerôs Representative of such discoveries and carry out the Employerôs Representativeôs instructions for dealing with them.

6. Work Programme and Sub-Contracting

6.1 Within seven days after Site possession date, the Contractor shall submit to the Employerôs Representative for approval a programme showing the general methods, arrangements, order and timing for all the activities in the Works.

6.2 The Contractor may sub contract the Works (but only to a maximum of 25 percent of the Contract Price) with the approval of the Employerôs Representative. However, he shall not assign the Contract without the approval of the Employer in writing. Sub-Contracting shall not alter the Contractorôs obligations.

7. The Site

7.1 The Employer shall give possession of all parts of the Site to the Contractor.

7.2 The Contractor shall allow the Employerôs Representative and any other person authorized by the Employerôs Representative, access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.

8. Instructions

8.1 The Contractor shall carry out all instructions of the Employerôs Representative which are in accordance with the Contract.

9. Extension of Completion Date

9.1 The Employerôs Representative shall extend the Completion Date if an occurrence arises which makes it impossible for completion to be achieved by the Intended Completion Date. The Employerôs Representative shall decide whether and by how much to extend the Completion Date.

9.2 For the purposes of this Clause, the following occurrences shall be valid for consideration;

Delay by: -

(a) force majeure, or

(b) reason of any exceptionally adverse weather conditions, or

(c) reason of civil commotion, strike or lockout affecting any of the trades employed upon the Works or any of the trades engaged in the preparation, manufacture or transportation of any of the goods or materials required for the Works, or

(d) reason of the Employerôs Representativeôs instructions issued under these Conditions, or

(e) reason of the contractor not having received in due time necessary instructions, drawings, details or levels from the Employerôs Representative for which he specifically applied in writing on a date which having regard to the date for Completion stated in the appendix to these Conditions or to any extension of time then fixed under this Clause was neither unreasonably distant from nor unreasonably close to the date on which it was necessary for him to receive the same, or

(f) delay on the part of artists, tradesmen or others engaged by the Employer in executing work not forming part of this Contract, or

(g) reason of delay by statutory or other services providers or similar bodies engaged directly by the Employer, or

(h) reason of opening up for inspection of any Work covered up or of the testing or any of the Work, materials or goods in accordance with these conditions unless the inspection or test showed that the Work, materials or goods were not in accordance with this Contract, or

(i) reason of delay in appointing a replacement Employerôs Representative, or

(j) reason of delay caused by the late supply of goods or materials or in executing Work for which the Employer or his agents are contractually obliged to supply or to execute as the case may be, or

(k) delay in receiving possession of or access to the Site.

10. Management Meetings

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

10.2 Communication between parties shall be effective only when in writing.

11. Defects

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

11.2 The Employerôs Representative shall give notice to the Contractor of any defects before the end of the Defects Liability Period, which begins at Completion, and is defined in the Appendix to Conditions of Contract.

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

12. Bills of Quantities/Schedule of Rates

12.1 The Bills of Quantities/Schedule of Rates shall contain items for the construction, installation, testing and commissioning of the Work to be done by the Contractor. The Contractor will be paid for the quantity of the Work done at the rates in the Bills of Quantities/Schedule of Rates for each item. Items against which no rate is entered by the Tenderer will not be paid for when executed and shall be deemed covered by the rates for other items in the Bills of Quantities/Schedule of Rates.

12.2 Where Bills of Quantities do not form part of the Contract, the Contract Price shall be a lump sum (which shall be deemed to have been based on the rates in the Schedule of Rates forming part of the tender) and shall be subject to re-measurement after each stage.

13. Variations

13.1 The Contractor shall provide the Employerôs Representative with a quotation for carrying out the variations when requested to do so. The Employerôs Representative shall assess the quotation and shall obtain the necessary authority from the Employer before the variation is ordered.

13.2 If the Work in the variation corresponds with an item description in the Bill of Quantities/Schedule of Rates, the rate in the Bill of Quantities/Schedule of Rates shall be used to calculate the value of the variation. If the nature of the Work in the variation does not correspond with items in the Bill of Quantities/Schedule of Rates, the quotation by the Contractor shall be in the form of new rates for the relevant items of Work.

13.3 If the Contractorôs quotation is unreasonable, the Employerôs Representative may order the variation and make a change to the Contract Price, which shall be based on the Employerôs Representativeôs own forecast of the effects of the variation on the Contractorôs costs.

14. Payment Certificates and Final Account

14.1 The Contractor shall be paid after each of the following stages of Work listed herebelow (subject to re-measurement by the Employerôs Representative of the Work done in each stage before payment is made). In case of lump sum Contracts, the valuation for each stage shall be based on the quantities so obtained in the re-measurement and the rates in the Schedule of Rates.

(i) Advance payment [after Contract execution] **NIL** (*percent of Contract Price, to be inserted by the Employer).*

(ii) First stage (*define stage)* ***AS PER PROGRESS***

(iii) Second stage *(define stage*) ***AS PER PROGRESS***

(iv) Third stage (*define stage)* ***AS PER PROGRESS***

(v) After defects liability period.

14.2 Upon deciding that Works included in a particular stage are complete, the Contractor shall submit to the Employerôs Representative his application for payment. The Employerôs Representative shall check, adjust if necessary and certify the amount to be paid to the Contractor within 21 days of receipt of the Contractorôs application. The Employer shall pay the Contractor the amounts so certified within 30 days of the date of issue of each Interim Certificate.

14.3 The Contractor shall supply the Employerôs Representative with a detailed final account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Employerôs Representative shall issue a Defect Liability Certificate and certify any final payment that is due to the Contractor within 30 days of receiving the Contractorôs account if it is correct and complete. If it is not, the Employerôs Representative shall issue within 21 days a schedule that states the scope of the corrections or additions that are necessary. If the final account is still unsatisfactory after it has been resubmitted, the Employerôs Representative shall decide on the amount payable to the Contractor and issue a Final Payment Certificate.

The Employer shall pay the Contractor the amount so certified within 60 days of the issue of the Final Payment Certificate.

14.4 If the period laid down for payment to the Contractor upon each of the Employerôs Representativeôs Certificate by the Employer has been exceeded, the Contractor shall be entitled to claim simple interest calculated pro-rata on the basis of the number of days delayed at the Central Bank of Kenyaôs average base lending rate prevailing on the first day the payment becomes overdue. The Contractor will be required to notify the Employer within 15 days of receipt of delayed payments of his intentions to claim interest.

15. Insurance

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

16. Liquidated Damages

16.1 The Contractor shall pay liquidated damages to the Employer at the rate 0.01 per cent of the Contract price per day for each day that the actual Completion Date is later than the Intended Completion Date except in the case of any of the occurrences listed under Clause 9.2. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractorôs liabilities.

17. Completion and Taking Over

17.1 Upon deciding that the Work is complete the Contractor shall request the Employerôs Representative to issue a Certificate of Completion of the Works, upon deciding that the Work is completed.
The Employer shall take over the Site and the Works within seven days of the Employerôs Representative issuing a Certificate of Completion.

18. Termination

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

(a) the Contractor stops Work for 30 days continuously without reasonable cause or authority from the Employerôs Representative;

(b) the Contractor is declared bankrupt or goes into liquidation other than for a reconstruction or amalgamation;

(c) a payment certified by the Employerôs Representative is not paid by the Employer to the Contractor within 30 days after the expiry of the payment periods stated in Sub-Clauses 14.2 and 14.3 hereabove.

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

18.2 If the Contract is terminated, the Contractor shall stop Work immediately, and leave the Site as soon as reasonably possible. The Employerôs Representative shall immediately thereafter arrange for a meeting for the purpose of taking record of the Works executed and materials, goods, equipment and temporary buildings on Site.

19. Payment Upon Termination

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

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

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

20 Corrupt Gifts and Payments of Commission

20.1 The Contractor shall not:

(a) Offer or give or agree to give to any person in the service of the Employer any gifts or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract with the Employer or for showing or forbearing to show favour or disfavour to any person in relation to this or any other contract with the Employer.

(b) Any breach of this Condition by the Contractor or by anyone employed by him or acting on his behalf (whether with or without the knowledge of the Contractor) shall be an offence under the Laws of Kenya.

21. Settlement of Disputes

21.1 Any dispute arising out of the Contract which cannot be amicably settled between the parties shall be referred by either party to the arbitration and final decision of a person to be agreed between the parties. Failing agreement to concur in the appointment of an Arbitrator, the Arbitrator shall be appointed by the chairman of the Chartered Institute of Arbitrators, Kenya branch, on the request of the applying party.

22. APPENDIX TO CONDITIONS OF CONTRACT

THE EMPLOYER IS

Name: **Communications Authority of Kenya**

Address: **P.O. Box 14448-00800, NAIROBI**

Name of Employerôs Representative: **Director, Human Capital and Administration, Communications Authority of Kenya**

Address: **P.O. Box 14448-00800, NAIROBI**

The Works consist of **Supply, Delivery and Installation, Testing and Commissioning of Access Control System/Integration with Staff/Visitor Management System at CA Headquarters, Eldoret and Mombasa Regional Offices**

The Start Date shall be **as stated in the Contract.**

The Intended Completion Date for the whole of the Works shall be **as stated in the Contract.**

The following documents also form part of the Contract: **(Only as listed in Clause 2)**

The Site Possession Date shall be as **stated in the Contract and Agreement during Inception Meeting.**

The Sites are located as follows:-

- **CA Centre along Waiyaki Way, Nairobi**
- **Mombasa Regional Offices in Mombasa Town (NSSF Building)**
- **Eldoret Regional Offices in Eldoret Town (KVDA Plaza)**

The Defects Liability period is **6 Months**

Warranty Period for ALL Equipment is **12 Months**

Amount of Tender Security: **KSh. 500,000.00**

The name and Address of the Consultant for the Project is **EMpaq Limited, P. O. Box 68140-00200, Nairobi.**

The tender opening date and time is **on 3rd May, 2017 at 2.30 P.M**

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

Period of final measurement	:	**6 months after practical completion**
Liquidated and Ascertained damages:		**Ksh. 100,000.00 per week or part there of**
Prime cost sums for which the Contractor desires to tender	:	**NIL**
Period of honouring certificate	:	**To be advised in the Contract**
Percentage of certified value retained:		**10%**
Limit of retention fund	:	**5%**

PART C:

PRELIMINARIES
AND
GENERAL CONDITIONS

PART C - PRELIMINARIES AND GENERAL CONDITIONS

CONTENTS

PART C

CONTRACT PRELIMINARIES AND GENERAL CONDITIONS

1.01 **Examination of Tender Documents**

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

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

a) Work detailed in the Specification and in the Contract Drawings.

b) The Republic of Kenya Document ñGeneral Conditions of Contract for Electrical and Mechanical Worksò.

c) Other documents to which reference is made.

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

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

1.02 **Discrepancies**

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

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

1.03 **Conditions of Contract Agreement**

The Contractor shall be required to enter into a Contract with the Client.

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

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

1.04 **Payment**

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

1.05 **Definition of Terms**

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

i) **Employer:** The term ñ**Employer"** shall mean **Communications Authority of Kenya**

ii) **Consultants/Engineer:** The term **"Electrical Engineer"** shall mean **EMpaq Ltd.**

iii) **Contractor:** The term **"Contractor"** shall mean the persons or person, firm or Company whose tender for this work has been accepted, and who has entered into a contract agreement with the Contractor for the execution of the Contract Works, and shall include his or their heirs, executors, administrators, assigns, successors and duly appointed representatives.

iv) **Contract Works:** The term **"Contract Works"** shall mean all or any portion of the work, materials and articles, whether the same are being manufactured or prepared, which are to be used in the execution of this Contract and whether the same may be on site or not.

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

vi) **Working Drawings:** The term **"Working Drawings"** shall mean those drawings required to be prepared by the Contractor as hereinafter described.

vii) **Record Drawings:** The term **"Record Drawings"** shall mean those drawings required to be prepared by the Contractor showing ñas installedò and other records for the Contract Works.

viii) **Abbreviations:**

CM shall mean **Cubic Metre**
SM shall mean **Square Metre**
LM shall mean **Linear Metre**
LS shall mean **Lump Sum**
mm shall mean **Millimetres**
No. Shall mean **Number**
Kg. shall mean **Kilogram**
BS shall mean. **Current standard British Standard Specification published by the British Standard Institution, 2 Park Street, London W1, England**

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

1.06 **Site Location**

The sites of the Contract Works are as follows:-

- **CA Centre along Waiyaki Way, Nairobi**
- **Mombasa Regional Offices in Mombasa Town (NSSF Building)**
- **Eldoret Regional Offices in Eldoret Town (KVDA Plaza)**

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

1.07 **Duration of Contract**

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

1.08 **Scope of Contract Works**

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

The Contractor shall supply all accessories, whether of items or equipment supplied by the Client but to be fixed and commissioned under this Contract

1.09 **Extent of the Contractor's Duties**

At the commencement of the works, the Contractor shall investigate and report to the Engineer if all materials and equipment to be used in the work and not specified as supplied by the others are available locally. If these materials and equipment are not available locally, the Contractor shall at this stage place orders for the materials in question and copy the orders to the Engineer. Failure to do so shall in no way relieve the Contractor from supplying the specified materials and equipment in time.

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

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

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

1.10 **Execution of the Works**

The works shall be carried out strictly in accordance with:

a) All relevant Kenya Bureau of Standards Specifications.

b) All relevant British Standard Specifications and Codes of Practice (Hereinafter referred to as B.S. and C.P. respectively).

c) This Specification.

d) The Contract Drawings.

e) The Bye-laws of the Local Authority.

f) The Engineerôs Instructions.

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

1.11 **Validity of Tender**

The tender shall remain valid for acceptance within 120 days from the final date of submission of the tender, and this has to be confirmed by signing the Tender Bond. The tenderer shall be exempted from this Bond if the tender was previously withdrawn in writing to the Employer before the official opening.

1.12 **Firm – Price Contract**

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

1.13 **Variation**

No alteration to the Contract Works shall be carried out until receipt by the Contractor of written instructions from the Employerôs Representative

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

Where the Engineer requires additional work to be performed, the Contractor, if he considers it necessary, will give notice within seven (7) days to the Contractor of the length of time he (the Contractor) requires over and above that allotted for completion of the Contract.

If the Contractor fails to give such notice he will be deemed responsible for the claims arising from the delay occasioned by reason of such extension of time.

1.14 **Prime Cost and Provisional Sums**

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

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

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

1.15 **Bond**

The tenderer must submit with his tender the name of one Surety who must be an established Bank only who will be willing to be bound to the Client for an amount equal to 5% of the Contract amount as Clause 31 of the Main Contract.

1.16 **Government Legislation and Regulations**

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

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

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

1.17 **Import Duty and Value Added Tax**

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

1.18 **Insurance Company Fees**

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

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

1.19 **Provision of Services by the Contractor**

In accordance with Clause 1.08 of this Specification the Contractor shall make the following facilities available for his work:

a) Attendance on the Contractor and the carrying out of all work affecting the structure of the building which may be necessary, including all chasing, cutting away and making good brickwork, etc., except that all plugging for fixing, fittings, machinery, fan ducting, etc., and all drilling and tapping of steel work shall be the responsibility of the Contractor. Any purpose made fixing brackets shall not constitute Builderôs Work and shall be provided and installed by the Contractor unless stated hereinafter otherwise.

b) The provision of temporary water, lighting and power: All these services utilized shall be paid for by the Contractor. The Contractor shall, however, allow for additional connections/extensions required for his purposes.

c) Fixing of anchorage and pipe supports in the shuttering, except that all anchorage shall be supplied by the Contractor .

d) i) Provision of scaffolding, cranes, etc. but only in so far as it is required for the Contract Works.

ii) Any specialist scaffolding, cranes, etc. by the Contractor for his own exclusive use shall be paid for by the Contractor.

1.20 **Suppliers**

The Contractor shall submit names of any supplier for the materials to be incorporated, to the Engineer for approval. The information regarding the names of the suppliers may be submitted at different times, as may be convenient, but no sources of supply will be changed without prior approval.
Each supplier must be willing to admit the Engineer or his representative to his premises during working hours for the purpose of examining or obtaining samples of the materials in question.

1.21 **Samples and Materials Generally**

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

1.22 **Administrative Procedure and Contractual Responsibility**

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

1.23 **Bills of Quantities**

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

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

1.24 **Contractor's Office in Kenya**

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

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

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

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

1.25 **Builder's Work**

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

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

Any purpose made fixing brackets shall not constitute builderôs work and shall be provided and installed by the Contractor unless stated hereinafter to the contrary.

1.26 **Structural Provision for the Works**

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

The preliminary major structural provision made will be deemed as adequate unless the Contractor stated otherwise when submitting his tender.

Any major structural provision or alteration to major structural provisions required by the Contractor shall be shown on Working Drawings to be submitted to the Engineer within 30 days of being appointed.

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

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

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

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

Services throughout the ducts shall be arranged to allow maximum access along the ducts and the services shall be readily accessible for maintenance. Any work, which has to be re-done due to negligence in this respect, shall be the Contractorôs responsibility.

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

1.28 **Checking of Work**

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

1.29 **Setting to Work and Regulating System**

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

No testing or commissioning shall be undertaken except in the presence of and to the satisfaction of the Engineer unless otherwise stated by him (Contractorôs own preliminary and proving tests excepted).

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

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

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

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

1.30 **Identification of Plant Components**

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

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

1.31 **Contract Drawings**

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

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

1.32 **Working Drawings**

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

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

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

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

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

a) Any drawings required by the Engineer to enable structural provisions to be made including Builderôs Working Drawings or Schedules and those for the detailing of holes, fixings, foundations, cables and paperwork ducting below or above ground or in or outside or below buildings.

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

c) Schematic Layout Drawings of services and of control equipment.

d) Layout Drawings of all embedded and non-embedded paperwork, ducts and electrical conduits.

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

f) Such other drawings as are called for in the text of the Specification or Schedules or as the Engineer may reasonably require.

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

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

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

Approval by the Engineer of Working Drawings shall neither relieve the Contractor of any of his obligations under the Contract nor relieve him from correcting any errors found subsequently in the Approved Working Drawings or other Working Drawings and in the Contract Works on site or elsewhere associated therewith.

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

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

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

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

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

a) Working Drawings amended as necessary but titled ñRecord Drawingsò and certified as a true record of the ñAs Installedò Contract Works. Subject to the approval of the Engineer such Working Drawings as may be inappropriate may be omitted.

b) Fully dimensioned drawings of all plant and apparatus

c) General arrangement drawings of equipment, other areas containing plant forming part of the Contract Works and the like, indicating the accurate size and location of the plant and apparatus suitability cross-referenced to the drawings mentioned in (b) above and hereinafter.

d) Routes, types, sizes and arrangement of all pipework and ductwork including dates of installation of underground pipework.

e) Relay adjustment charts and manuals.

f) Routes, types, sizes and arrangement of all electric cables, conduits, ducts and wiring including the dates of installation of buried works.

g) System schematic and trunking diagrams showing all salient information relating to control and instrumentation.

h) Grading Charts.

i) Valve schedules and locations suitability cross-referenced.

j) Wiring and piping diagrams of plant and apparatus.

k) Schematic diagrams of individual plant, apparatus and switch and control boards. These diagrams to include those peculiar to individual plant or apparatus and also those applicable to system operation as a whole.

l) Operating Instruction

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

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

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

Notwithstanding the Contractorôs obligations referred to above, if the Contractor fails to produce to the Engineerôs approval, either:-

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

b) The Record Drawings, etc., within one month of the Section or Practical Completion

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

1.34 **Maintenance Manual**

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

The manual shall be loose-leaf type, International A4 size with stiff covers and cloth bound. It may be in several volumes and shall be sub-divided into sections, each section covering one Engineering service system. It shall have a ready means of reference and a detailed index.

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

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

a) System Description.

b) Plant

c) Valve Operation

d) Switch Operation

e) Procedure of Fault Finding

f) Emergency Procedures

g) Lubrication Requirements

h) Maintenance and Servicing Periods and Procedures

i) Colour Coding Legend for all Services

j) Schematic and Writing Diagrams of Plant and Apparatus

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

l) Lists of Primary and Secondary Spares.

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

1.35 **Hand-over**

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

The procedure to be followed will be as follows:

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

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

c) The Contractor shall arrange with the Engineer and Employer for a complete demonstration of each and every service to be carried out and for instruction to be given to the relevant operation staff and other representatives of the Employer.

d) In the presence of the Employer and the Engineer, Hand-over will take place, subject to Agreement of the Hand-over Certificates and associated check lists.

1.36 **Painting**

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

1.37 **Spares**

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

1.38 **Testing and Inspection – Manufactured Plant**

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

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

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

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

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

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

1.39 **Testing and Inspection -Installation**

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

1.40 **Labour Camps**

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

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

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

1.41 **Storage of Materials**

Space for storage will be provided by the Client but the Contractor will be responsible for the provision of any lock-up sheds or stores required.

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

1.42 **Initial Maintenance**

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

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

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

1.43 **Maintenance and Servicing After Completion of the Initial Maintenance**

The Contractor shall, if required, enter into a maintenance and service agreement with the employer for the installation for a period of up to five years from the day following the last day of the liability for Defects Period which offers the same facilities as specified in Clause 1.41 (Initial Maintenance).

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

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

1.44 **Trade Names**

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

1.45 **Water and Electricity for the Works**

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

1.46 **Protection**

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

1.47 **Defects After Completion**

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

1.48 **Damages for Delay**

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

1.49 **Clear Away on Completion**

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

1.50 **Final Account**

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

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

Statement B - detailing all the variation orders issued on the contract.

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

1.51 **Fair Wages**

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

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

b) In the absence of any rates of wages, hours or conditions of labour so established the Contractor shall pay rates and observe hours and conditions of labour are not less favourable than the general level of wages, hours and conditions observed by other employers whose general circumstances in the trade or industry in which the Contractor is engaged are similar.

1.52 **Supervision**

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

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

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

Depending on the scope of coordination works required onsite, the Engineer shall recommend the appointment of a Resident Electrical Engineer, who will be required to be based on site. The Resident Engineer shall be appointed and paid by the Engineer. Provision to be made for the appointment of the Resident Engineer.

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

1.53 **Test Certificates**

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

1.54 **Labour**

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

1.55 **Discount to the Main Contractor**

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

1.56 **Guarantee**

The whole of the work will be guaranteed for a period of twelve (12) months from the date of the Architectôs certification of completion and under such guarantee the Contractor shall remedy at his expense all defects in materials and apparatus due to faulty design, construction or workmanship which may develop in that period.

PART D:

TECHNICAL SPECIFICATIONS
FOR
COMMUNICATIONS SERVICES

PART D: TECHNICAL SPECIFICATIONS FOR COMMUNICATIONS SERVICES

CONTENTS

1.0 AN OVERVIEW OF CABLING STANDARDS

1.1 ANS/TIA/EIA-568-A and ISO/IEC 11801

The latest editions of the ANS/TIA/EIA-568-A (568-A) AND iso/iec 11801 (ó11801) cabling standards were both published in 1995. The following overview provides some of the requirements and recommendations of each standard including differences between them.

1.2 ANS/TIA/EIA-568-A

Commercial Building Telecommunications Cabling Standard.

The Telecommunications Industry Association (TIA) TR42.1 (formerly TR41.8.1) working Group on telecommunications cabling published the ANSI/TIA/EIA-568-A standard in 1995.

1.3 ISO/IEC 11801

Information Technology ï Generic Cabling for Customer Premises.

The International Organization for Standardization (ISO) SC 25/WG 3 Working Group on telecommunications cabling published the ISO/IEC 11801 standard in 1995.

Following are highlights of the ó568-A standard and related Telecommunication Systems Bulletins (TSBs) with notes on differences in terminology and technical requirements with respect to ó11801. For clarity and consistency, ó568-A based terminology is used in the following overview.

Purpose

- To specify a generic voice and data telecommunications cabling system that will support a multi-product, multi-vendor environment.
- To provide direction for the design of telecommunications equipment and cabling products intended to serve commercial enterprises.
- To enable the planning and installation of a structured cabling system for commercial buildings that is capable of supporting the diverse telecommunications needs of building occupants.
- To establish performance and technical criteria for various types of cable and connecting hardware and for cabling system design and installation.

Scope

- Specifications are intended for telecommunications installations that are ñoffice orientedò.
- Requirements are for structured cabling system with a usable life in excess of 10 years.
- Specifications addressed:
    - Recognized Media
    - Cable and connecting Hardware
    - Performance
    - Topology
    - Cabling Distance
    - Installation Practices
    - User Interfaces
    - Channel Performance

Cabling Elements

- Horizontal Cabling:
    - Horizontal Cross-connect (HC)
    - Horizontal Cable
    - Transition Point (optional)
    - Consolidation Point (optional0
    - Telecommunications-Outlet/Connector (TO)

- Backbone Cabling
    - Main Cross-connect (MC)
    - Interbuilding Backbone Cable
    - Intermediate Cross-connect (IC)
    - Intrabuilding Backbone Cable

- Work Area (WA)

- Telecommunications Closet (TC)

- Equipment Room (ER)

- Entrance Facility (EF)

- Administration

2.0 HORIZONTAL CABLING SYSTEM STRUCTURE

The horizontal cabling system extends from the telecommunications outlet in the work area to the horizontal cross-connect in the telecommunications closet. It includes the telecommunications outlet, an optional consolidation point or transition point connector, horizontal cable, and the mechanical terminations and patch cords (or jumpers) that comprise the horizontal cross-connect.

2.1 Some points specified for the horizontal cabling subsystem include:

- Recognized Horizontal Cables:

  4 pair 100 Ω unshielded twisted-pair.

  2-fiber (duplex) 62.5/125 μm or multimode optical fiber 9note: 50/125 μm multimode fiber will be allowed in ó568-B)

- A minimum of two telecommunications outlets are required for each individual work area.

  First outlet: 100 Ω twisted pair (category 5e is recommended)

  Second outlet: 100 Ω twisted pair.

  Two-fiber multimode optical fiber either 62.5/125 μm or 50/125 μm.

- One transition point (TP) is allowed between different forms of the same cable type (i.e. where undercarpet cable connects to round cable)

- 50 Ω coax and 150 Ω STP-A cabling is not recommended for new installations.

- Additional outlets may be provided. These outlets are in addition to and may not replace the minimum requirements of the standard.

- Bridged taps and splices are not allowed for copper-based horizontal cabling. (Splices are allowed for fiber).

- Application specific components shall not be installed as part of the horizontal cross-connect (eg. Splitters, baluns).

- The proximity of horizontal cabling to sources of electromagnetic interference (EM) shall be taken into account.

3.0 BACKBONE CABLING SYSTEM STRUCTURE

The backbone cabling system provides interconnections between telecommunications closets, equipment rooms, and entrance facilities. It includes backbone cables, intermediate and main cross-connects, mechanical terminations, and patch cords or jumpers used for backbone-to-backbone cross-connections. The backbone also extends between buildings in a campus environment.

- Equipment connections to backbone cabling should be made with cable lengths of 30m (98 ft) or less.

- The backbone cabling shall be configured in a star topology. Each horizontal cross-connect is connected directly to a main cross-connect or to an intermediate cross-connect, then to a main cross-connect.

- The backbone is limited to no more than two hierarchical levels of cross-connects (main and intermediate). No more than one cross-connect may exist between a main and a horizontal cross-connects may exist between any two horizontal cross-connects.

- A total maximum backbone distance of 90m (295 ft.) is specified for high band-width capability over copper. This distance is for uninterrupted backbone runs. (No intermediate cross-connect).

- The distance between the terminations in the entrance facility and the main cross-connect shall be documented and should be made available to the service provider.

- Recognized media may be used individually or in combination, as required by the installation. Quantity of pairs and fibers needed in individual backbone runs depends on the area served. Recognized backbone cables are:

  100 Ω UTP
  150 Ω stp-a
  625/125µ Multimode Optical Fiber
  Single mode Optical Fiber

- Multipair cable is allowed, provided that it satisfies the power sum crosstalk requirements.

- The proximity of backbone cabling to sources of electromagnetic interference (EMI) shall be taken into account.

- Cross-connects for different cable types must be located in the same facilities.

- Bridged taps are not allowed.

3.1 WORK AREA:

The telecommunications outlet serves as the work area interface to the cabling system. Work area equipment and cables used to connect to the telecommunications outlet are outside the scope of ó568-A and ó11801, but are expected to be specified in the next edition of these standards.

4.0 OPEN OFFICE CABLING:

Additional specifications for horizontal cabling in areas with moveable furniture and partitions have been introduced in TIA/EIA TSB75. Horizontal cabling methodologies are specified for ñopen-officeò environments by means of multi-user telecommunications outlet assemblies and consolidation points. These methodologies are intended to provide increased flexibility and economy for installation with open office work spaces that require frequent configuration.

HORIZONTAL DISTANCES OF COPPER LINKS (OPEN OFFICE)

Copper work area cables connected to a MuTOA, shall meet the requirements of ó568-A (sec. 10.5 and 11.5). The maximum length of copper work area cables shall be determined according to:

C = (102 ï H)/12
W = C ï 7 (<29 m)

Where:
C is the combined length of the work area cable, equipment Cable, and patch cord (m).
W is the length of the work area cable (m).
H is the length of the horizontal cable (m)

The above equations assume that there is a total of 7m (23 ft.) of patch and equipment cables in the telecommunications closet. Table 1 shows the application of these formulae. The length of work area cables shall not exceed 20m (66 ft). The MuTOA shall be marked with the maximum allowable work area cable length.

Length of Horizontal Cable	Maximum Length of Work Area Cable	Maximum Combined Length of Work Area Cables, Patch Cords, and Equipment Cable
H m (ft)	W m (ft)	C m(ft)
90 (295)	3 (10)	10 (33)
85 (279)	7 (23)	14 (46)
80 (262)	11 (36)	18 (59)
75 (246)	15 (49)	22 (72)
70 (230)	20 (66)	27 (89)

Table 1 ï Maximum Length of Work Area Cables

5.0 HORIZONTAL DISTANCES OF OPTICAL FIBER LINKS (LONG WORK AREA CABLES)

For optical fiber cables, any length combination or length of the horizontal channel does not exceed 100m (328 ft).

When deploying a centralized fiber cabling topology, the general guidelines of TSB72 shall be followed.

6.0 TELECOMMUNICATIONS CLOSET

Telecommunications closets are generally considered to be floor serving facilities for horizontal cable distribution. They may also be used for intermediate and main cross-connects.

Some specifications related to the telecommunications closet:

- Closets shall be designed and equipped in accordance with ANSI/TIA/EIA-569-A.
- Cable stress from tight bends, cable ties, staples, and tension should be avoided by well-designed cable management.
- Only standards-compliant connecting hardware shall be used.
- Cables and cords used for active equipment connections are outside the scope of the standard (10m total allowed for patch cords, equipment cables, and work area cables for each link).
- Application-specific electrical components shall not be installed as part of the horizontal cabling.
- Horizontal cable terminations shall not be used to administer cabling system changes. Instead, jumpers patch cords, or equipment cords are required for re-configuring cabling connections

The two types of schemes used to connect cabling subsystems to each other and to equipment are known as interconnections and cross-connections.

DEFINITIONS:

Cross-Connection:
A connection scheme using patch cords or jumpers that attach to connecting hardware on each end.

Interconnection:
A connection scheme that provides for direct connections to building cabling from equipment without a patch cord.

7.0 TWISTED-PAIR (BALANCED) CABLING

The six categories of transmission performance specified for cables, connecting hardware and links are:

Designation	Transmission Characteristics	Description
3	Transmission characteristics are specified up to 16 MHz.	Meets applicable category 3 and Class C requirements of ISO/IEC 11801 (including amendments A.1 & A.2), ANSI/TIA/EIA-568-A (including addenda A-1, A-2, & A.3) and TSB67. Requirements are specified to an upper frequency limit of 16MHz.
4	Transmission characteristics are specified up to 20 MHz	Meets applicable category 4 requirements of ISO/IEC 11801 (including amendments A.1 & A.2), ANSI/TIA/EIA-568-A (including addenda A-1, A-2 & A-3) and TSB67.Requirements are specified to an upper frequency limit of 20 MHz. This classification is a superset of 3
5	Transmission characteristics are specified up to 100 MHz.	Meets applicable ca Category 5 and class D requirements of ISO/IEC 11801 (including addenda A-1, A-2 & A-3), TSB67 and draft TSB95. Requirements are specified to an upper frequency limit of 100 MHz. This classification is a superset of 4.
5e	Transmission characteristics are specified up to 100 MHz.	Performs to category 5e and additional class D requirements of draft amendment 3 of ISO/IEC 11801, and draft addendum 5 to ANSI/TIA/EIA-568-A. Requirements are specified to an upper frequency limit of 100 MHz. This classification is a superset of 5.
6.	Transmission characteristics Will be specified up to 250 MHz.	Performs to category 6 and class E requirements under development by

		ISO/IEC and TIA. Requirements are expected to be specified to an upper frequency limit of at least 250 MHz. This classification is a superset of 5e
7.	Transmission characteristics will Be specified up to 600 MHz.	Performs to category 7 and class F requirements under development by ISO/IEC. Requirements are expected to be specified to an upper frequency limit of at least 600 MHz. This classification is an electrical superset of 6.

Category 6 and 7 industry are currently under development.

8.0 UTP TELECOMMUNICATIONS OUTLET/CONNECTOR

- 8-position modular jack per IEC 60603-7 (.568-A states that all pairs must be connected).
- Pin/pair assignment: T568A Optional assignment to accommodate certain systems: T568B.
- Durability rating 750 mating cycles minimum.
- Backward compatibility and interoperability is required.

9.0 FULLY SHIELDED TELECOMMUNICATIONS OUTLET/CONNECTOR.

- Entirely new interface design to support class F cabling.
- Will require a new wiring pin/pair assignment.
- Transmission measurement methods for category 7 are under study.
- Durability rating 1000 mating cycles minimum.

10.0 UTP CONNECTING HARDWARE VS. CABLE NEXT PERFORMANCE.

- Specifications cover all types of connectors used in the cabling system including the telecommunications outlet/connector.
- Does not cover work area adapters, baluns, protection, MAUs, filters, or other application-specific devices.
- Temperature range -10°C (14°F) to 60°C (140°F).
- Outlets shall be securely mounted. Outlet boxes with unterminated cables must be covered and marked.
- Transmission requirements are much more severe than cable of a corresponding category.
- Performance markings should be provided to show the applicable transmission category and should be visible during installation (for example 5e) in addition to safety markings.
- Installed connectors shall be protected from physical damage and moisture.

10.1 UTP LINK PERFORMANCE MARKING AND IDENTIFICATION

- Link category marking should be clearly visible on both ends (component markings are not sufficient).
- Labelling, markings, and color-coding shall be provided in accordance with ANSI/TIA/EIA-606.

11.0 SCREENED CABLING (ScTP)

As a result of the release of TIA/EIA/IS-729 and the maturity of the ó568-A and ó11801 standards, telecommunications groups recognize the presence of an overall shield over four twisted-pairs; a media hybrid termed Screened Twisted-Pair or ScTP cabling.

11.1 ScTP:

- Color-coding:
  Pair 1 = White/Blue-Blue
  Pair 2 = White/Orange-Orange
  Pair 3 = White/Green-Green.
  Pair 4 = White/Brown-Brown

- 0.51mm (24 AWG) 100 q 4-pair enclosed by a foil shield.
- A copper conductor drain wire of .040mm (26 AWG) or larger shall be provided.
- Should be marked ñ100 q ScTPò, in addition to any safety markings required by local or national codes.
- Same mechanical and transmission requirements apply to backbone and horizontal cables.
- Additional performance requirements, including surface transfer impedance, is specified in the IS-729 standard entitled, ñTechnical Specifications for 100 q Screened Twisted-Pair Cablingò.

11.2 ScTP Connectors:

- Interface and pair assignments same as IEC 60603-7 (ó568-A states that all 4 pairs must be connected).
- Additional transfer impedance and shield mating interface requirements specified in the IS-729 standard entitled, ñTechnical Specifications for 100 q Screened Twisted-pair Cablingò.

11.3 ScTP Patch Cords:

- Specifications call for 26 AWG (7 strands @ 0.15mm) or 24 AWG (7 strands @ 0.20mm) stranded conductors.
- Allows for an overall shield.
- Less severe attenuation than horizontal cable.

11.4 ScTP Installation Practices:

- Shield shall be bonded at both ends at the ñTelecommunication Grounding Busbarò.
- The difference between the two grounds shall be no more than 1.0 V RMS.

12.0 FULLY SHIELDED CABLING (SSTP)

Fully shielded cabling requirements are under development by ISO. Cable and connector specification will extend to at least 600 MHz and are intended to support the pending class F cabling requirements.

12.1 Fully Shielded Cable:

- Color-coding:
  Pair 1 = White/Blue-Blue
  Pair 2 = White/Orange-Orange
  Pair 3 = White/Green-Green
  Pair 4 = White/Brown-Brown

- Four 0.51mm (24 AWG) or larger 100 q twisted-pairs each enclosed by an individual foil shield with an overall shield provided over the four-pairs.
- Mechanical and transmission requirements are under development by ISO.

12.2 Fully Shielded Connectors:

- Interface and pair assignments are under development by ISO and will be entirely different from the T568A and T568B assignments.
- Mechanical and transmission requirements are under development by ISO.

12.3 Fully Shielded Patch Cables.

- Mechanical and transmission requirements are under development by ISO.

12.4 Fully Shielded Installation Practices:

- Installation Practices are under development by ISO.-

12.5 TSB67
Transmission Performance Specifications for Field Testing of UTP Cabling Systems

This bulletin provides users with the opportunity to use comprehensive test methods to validate the transmission performance characteristics of installed category 5 and lower grade UTP cabling systems. The categories of UTP cabling systems in this bulletin also correspond with the UTP cabling categories of ANSI/TIA/EIA-568-A.Additional transmission performance and applicable field test requirements are referenced in TSB95, ó568-A-5 and amendment 2 to ó11801 (FDAM 2)

12.6 Some points specified for TSB67 transmission field testing for UTP Cabling Systems

- UTP cabling systems are comprised of cables and connecting hardware specified in TIA/EIA-568-A.
- Required test parameters include wire-map, length, attenuation, and crosstalk.
- Two levels of pass or fail are indicated, depending on measured margin compared to minimum specifications. Testing of NEXT loss is required in both directions.
- Level II equipment meets the most stringent requirements for TSB67 measurement accuracy. Level IIe equipment will be required to verify category 5e and FDAM 2 performance.
- Requirements are intended for performance validation and are provided in addition to ó568-A requirements on components and installation practices.

13.0 OPTICAL FIBER CABLING

The current ó568-A specification on optical fiber cabling consists of one recognized cable type for horizontal subsystems and two cable types for backbone subsystems:

Horizontal ï 62.5/125 ε m multimode (two fibers per outlet).
Backbone - 62.5/125 ε m multimode or singlemode.

ó568-B will allow the use of 50/125 ε m multimode optical fiber in both the horizontal and backbone in addition to the types listed above.
All optical fiber components and installed practices shall meet applicable building and safety codes

13.1 Optical Fiber Patch Cords:

- Shall be a two-fiber (duplex) indoor cable Of the same type as the cables to which they connect.
- Shall allow for easy connection and reconnection and ensure that polarity is maintained (568SC) configuration required).
- Shall perform a pair-wise cross-over of fiber positions A and B. (If provided in simplex form, one connector shall be identified as ñAò and the other ñBò.)

13.2 Installation of Optical Fiber Connecting Hardware:

- Connectors shall be protected from physical damage and moisture.
- Capacity for 12 or more fibers per rack space [44.5mm (1.75 in.)] should be provided.
- Optical fiber connecting hardware shall be installed:
  - To provide well organized installation with cable management.
  - In accordance with manufacturerôs guidelines.

13.3 Optical Fiber Cabling Installation:

- A minimum of 1m (3.28 ft.) of two-fiber cable (or two buffered fibers) shall be accessible for termination purposes.
- Testing is recommended to assure correct polarity and acceptable link performance. Informative Annex H of ó568-A is provided for recommended optical fiber link performance testing criteria.

13.4 Optical Fiber Work Area Connector:

- A simplex or duplex SC connector shall be used at the work area.
- Recommended adapter and connector is the 586SC (a duplex SC that is capable of simplex operation).

13.5 Optical Fiber Connections:

- Connector designs shall meet the requirements of the corresponding TIA FOCIS documents.
- Telecommunications outlet/connector boxes shall be securely mounted at planned locations.
- The telecommunications outlet/connector box shall have:
  - The ability to secure optical fibers.
  - Cable management means to assure a minimum bend radius of 25mm (1.00 in.) and should have slack storage capability.
  - Provisions for terminating a minimum of two optical fibers into a 568SC adapter.
- Identification of fiber types:
  - Multimode connectors and adapters shall be identified with the color beige.
  - Single mode connectors and adapters shall be identified with the color blue.
- The two positions in a duplex connector are referred to as ñposition Aò and ñposition Bò.
- The 568SC adapter performs a pair-wise cross-over between position A and position B of two mated connectors.
- Optical fiber runs intended for future connections shall be stored in a telecommunications outlet/connector box.

13.6 Small Form Factor (SFF) Connectors:

- Qualified SFF duplex and multi-fiber connector designs may be used in the main cross connect, intermediate cross-connect, horizontal cross-connect, and consolidation points.
- A TIA Fiber Optic Connect Intermateability Standard (FOCIS) shall describe each SFF design.
- The SFF design shall satisfy the requirements specified in Annex A of the proposed ó568-B.3 standard.
- Some advantages of SFF connectors include compact size, modular compatibility with the eight position modular copper interface, and adaptability to high-density network electronics.

13.7 TSB72
Centralized Optical Fiber Cabling Guidelines

This Telecommunications Systems Bulletin (TSB) provides the user with the flexibility of designing an optical fiber cabling systems for centralized electronics typically in single tenant buildings. It contains information and guidelines for centralized optical fiber cabling.

Some points specified in TSB-72 for a centralized optical fiber cabling system include:

- Intended for single-tenant users who desire centralized vs. distributed electronics.
- Implementation allows cables to be spliced or interconnected at the telecommunications closet such that cables can be routed to a centralized distributor for total cable lengths of 300m (984 ft.) or less, including patch cords or jumpers.
- Allows for migration from an interconnection or splice to a cross-connection scheme that can also support distributed electronics.
- Pull-through implementations are allowed when total length between the tele-communications outlet/connector and centralized cross-connect and centralized cross-connect is 90m (295 ft.) or less.
- Connecting hardware required to:
  - join fibers by re-mateable connectors or splices,
  - connectors shall be 568SC interface,
  - provide for simplex or duplex connection of optical fibers,
  - provide means of circuit identification,
  - allow for addition and removal of optical fibers.

Note: Some multi-mode fiber implementations may be limited to an operating range of 220m to support 1000BASE-SX.

13.8 TIA/EIA-568-A-1

Propagation Delay and delay Skew

This addendum to ó568-A describes propagation delay and delay skew requirements for all ó568-A compliant 4-pair 100Ω cables. Propagation delay and delay skew requirements of multipair cables are subject to additional study.

Propagation delay is equivalent to the amount of time that passes between when a signal is transmitted and when it is received at the other end of a cabling channel. Delay skew is the difference between the pair with the least delay and the pair with the most delay. Transmission errors that are associated with excessive delay and the delay skew include increased jitter and bit error rates.

The maximum propagation delay skew requirement for 4-pair 100Ω cables is frequency dependent and is specified by the following equation:

Delay (ns/100m) ≤ 534 + 36/√äMHz

Cable delay skew shall not exceed 45 ns/100m between 1 MHz and the highest referenced frequency for a given category.

It is anticipated that the requirements of ó568-A-1 will also be applicable to pending category 6 cable propagation delay and delay skew specifications while more stringent performance criteria will be specified for pending category 7 cables.

13.9 TIA/EIA-568-A-2

Corrections and additions to TIA/EIA-568-A

This addendum to ó568-A provides modifications and corrections to the content of ó568-A as a result of advances in telecommunications research and development. Revisions are as follows:

1. Centralized optical fiber cabling is referenced in two locations (5.2.1 and 7.4.1) as an alternative to the optical cross-connection located in the telecommunications closet when deploying 62.5/125 µm optical fiber cable in the horizontal. TIA/EIA TSB72 Centralized Optical Fiber Cabling Guidelines are also referenced.

2. The ANSI/ICEA reference in section 10.2.3 was updated to ANSI/ICEA S-90-661-1994 for specifying the physical and mechanical requirements of ó568-A recognized cables.

3. Additional text was incorporated into section 10.4.3.4 specifying that the connecting hardware used for 100Ω UTP cabling shall not result in or contain any transposed (e.g transposition of pairs 2 or 3) or reversed (also called tip/ring reversals) pairs. It is further noted that applications requiring transposed or reversed pairs shall utilize adapters, work area or equipment cords to swap pairs.

4. A reference to the TSB67 field test methodologies is added to section 10.6.4

5. The 568SC optical fiber connector axial pull off strength requirement was decreased from 22 N (5 lbf) to 19.4 N (4.4 lbf)

6. Globally, the word ñpolarizationò was replaced with ñpolarityò.

7. The initial contact resistance specified in Annex A for connecting hardware was increased from 1 mΩ to 2.5 mΩ and the contact resistance measurement method was re-written to be more user-friendly.

8. A provision for common mode terminations for testing connecting hardware NEXT loss and return loss was incorporated into Annex B. This revision accommodates telecommunications networking implementations that may employ common mode terminations in the active equipment.

13.10 TIA/EIA-568-A-3

Addendum 3 to TIA/EIS-568-A

As a result of the demand for open office architecture and the need to support multiple telecommunications applications in a shared sheath, this addendum to ó568-A addresses revised performance specifications for hybrid cables. ó568-A-3 also introduces a new term called ñbundled cablesò to describe 4-pair cable assemblies that are not covered by an overall sheath (as specified for hybrid cables), but by any generic binding method such as ñspeed-wrapò or ñcable-tiesò

The new hybrid and bundled cable requirements state that power sum NEXT loss between all non-fiber cable types within that cable shall be 3 dB better than the specified pair-to-pair NEXT loss for each cable type.

13.11 TIA/EIA-568-A-4

Production Modular Cord NEXT Loss Test Method and Requirements for Unshielded Twisted-Pair Cabling

TIA/EIA-568-A-4 defines a generic and non-destructive methodology for NEXT loss testing of modular plug cords. NEXT loss performance requirements for category 5 modular plug cords, when measured with the particular test head specified in the Standard, are provided. Note that, although the methodology may be used as the basis for determining the minimum NEXT loss performance requirements of other categories of modular plug cords, at present, the Standard does not define a test head or specific test limits for category 5e or category 6 patch cords. The methodology described in the Standard contains the detailed NEXT loss calculations (which are based upon patch cable NEXT loss, test head NEXT loss, and cable and connector attenuation contributions) for the determination of the NEXT loss limits for any category patch cord and suitably designed teat head.

13.12 TIA/EIA-568-A-5

Transmission Performance Specifications for 4-pair 100Ω Enhanced Category 5 Cabling.

ó568-A-5 specifies enhanced category 5 (category 5e) performance requirements. These requirements are recommended for new category 5 cabling installations and are expected to become the de facto minimum standard for category 5 cabling. This document addresses the minimum equal level far-end crosstalk (ELFEXT) and return loss requirements necessary to support developments in applications technology and defines the minimum performance needed for a worst case for-connector channel to support applications that utilize full-duplex transmission schemes, such as Gigabit Ethernet. To ensure additional crosstalk headroom for robust applications support, this document also specifies power sum performance requirements for category 5e cables and cabling.

Addendum óA-5 is a normative document and, unlike TSB95, it provides mandatory requirements, not recommendations.

13.13 TIA/EIA TSB95

Additional Transmission Performance Guidelines for 100Ω 4-pair Category 5 Cabling.

TSB95 outlines minimum recommendations for the new channel parameters of return loss and equal level far-end crosstalk (ELFEXT). These return loss and ELFEXT recommendations are specified to ensure the support of Gigabit Ethernet over installed or ñlegacyò category 5 cabling and were derived from worst case performances of channels with only two connection points. The two-connector channel topology is consistent with the IEEE committeeôs assumption that cabling used to support Gigabit Ethernet systems will most likely utilize an interconnect instead of a cross-connect field and will not include a consolidation or transition point connection. Existing installed category 5 cabling should be verified to ensure that performance meets the minimum recommendations of this document. Channel configurations with three or

four connectors that meet the specified ELFEXT and return loss recommendations will also support Gigabit Ethernet. Because the specifications of this document are applicable for the qualification of existing, installed cabling only, they are not recommended to be used As the minimum performance criteria for new category 5 cabling.

13.14 TIA/EIA/IS-729

Technical Specifications for 100Ω Screened Twisted-Pair Cabling.

IS-729 is an interim standard that supplements TIA-568-A and ISO/IES 11801 screened twisted-pair cabling specifications by describing additional technical requirements on the outlet interface, shield effectiveness, installation practices, and performance relative to ScTP links and components.

13.15 ISO/IEC 11801:1995 FDAM 2

Draft Amendment 2 to ISO/IEC 11801

The performance specifications in ISO amendment 2 provide new requirements for return loss and ELFEXT loss to compliment the existing ISO class D requirements. The new specified return loss and ELFEXT loss requirements are in harmony with the values proposed in ó568-A-5, however, the document does not specify additional NEXT loss margin over and above the existing class D requirements. FDAM 2 also includes propagation delay and delay skew requirements for channels and permanent links that are in harmony with the requirements of TIA/EIA-568-A-1

The requirements of amendment 2 to ISO/IES 11801 are normative and this document will become the governing international standard for new class D cabling installations.

14.0 CABLING SPECIFICATION CROSS-REFERENCE CHART (ANSI/TIA/EIA-568-A AND ISO/IEC 11801)

The following chart provides a side-by-side comparison that highlights many of the fundamental similarities and differences between ANSI/TIA/EIA-568-A and ISO/IEC 11801.

ANSI/TIA/EIA-568-A (and addenda) Commercial Building Telecommunications Cabling Standard	ISO/IEC 11801 (and amendments) Generic Cabling for Customer Premises

14.1 HORIZONTAL UTP CABLE

- Solid 4-pair 0.51mm (24 AWG) specified (0.64mm (22 AWG) solid also allowed). An overall shield ((ScTP) is optional.
- Performance marking should be provided to show the applicable performance category. These markings do not replace safety markings.
- Colour-coding:

  White/blue-blue
  White/orange-orange
  White/green-green
  White/brown-brown.

14.2 HYBRID AND BUNDLED CABLES

Hybrid/Bundled cables:

- Hybrid/bundled cables that contain multiple units of recognized horizontal copper cables are subject to additional NEXT loss requirements between cable units. These requirements assure a minimum of 3 dB additional power sum crosstalk isolation between applications that may operate on adjacent binder groups.
- All detailed specifications for the individual cable units used in the hybrid assembly still apply.
- Hybrid bundled cables shall meet the transmission requirements specified in TIA/EIA-568-A-3.

14.3 UTP PATCH CORDS AND CROSS-CONNECT JUMPERS.

- Patch cords must use stranded cable for adequate flex life
- Standard cables must meet the minimum performance requirements for horizontal cable except that 20 percent more attenuation is allowed by ó568-A and 50 percent more attenuation is allowed by ó11801.
- Color-code for cross-connect jumpers: One conductor white, the other a visibly distinct color such as red or blue.
- Performance markings should be provided to show the applicable transmission category in addition to safety markings.
- Insulated O.D of stranded wires should be 0.8mm (0.032 in.) to 1mm (0.039 in.) to fit into a modular plug.
- Production performance specifications for plug cord assemblies are addressed in ó568-A-4

- Color codes for stranded, 100 Ω UTP patch cord:

Option 1	Option 2
White/blue-blue	PAIR 1 green-red
White/orange-orange	PAIR 2 black-yellow
White/green-green	PAIR 3 blue-orange
White/brown-brown	PAIR 4 brown-slate

Note: Because of their identical pair groupings, patch cords terminated with either T568A or T568B pair assignments may be used interchangeably, provided that both ends are terminated with the same pin/pair scheme.

14.4 BACKBONE UTP CABLE

- Performance markings should be provided to show the applicable performance category. These markings do not replace safety markings.
- Services with incompatible signal levels should be partitioned into separate binder groups. Guidelines for shared sheaths are provided in Annex D of ó568-A.
- Transmission requirements are equivalent to horizontal cables except that NEXT loss performance is based on power-sum rather than worst-pair characterization to allow for multiple disturbing signals (of the same type) in the same sheath.
- Note: Tip conductors have colored insulation that corresponds to that of the binder group. Ring conductors have colored insulation that corresponds to that of the pair.
- Backbone UTP cables consist of solid 0.51 mm (24 AWG) cables that contain more than four pairs (typically multiples of 25-pairs are used). An overall shield is optional.
- Color-coding (specified by reference to ICEA)

15.0 MODULAR WIRING REFERENCE

Modular Jack Styles:

There are four basic modular jack styles. The 8-position modular outlets are commonly and incorrectly referred to as ñRJ45ò. The 6-position modular jack is commonly referred to as RJ11. Using these terms can sometimes lead to confusion since the RJ designation actually refer to very specific wiring configurations called Universal Service Order Code (USOC). The designation óRJô means Registered Jack. Each of these basic jack styles can be wired for different RJ configurations. For example, the 6-position jack can be4 wired as an RJ11C (1`-pair), RJ14C (2-pair), or RJ25C (3-pair) configuration. An 8-position jack can be wired for configurations such as RJ61C (4-pair) and RJ48C. The keyed 8-position jack can be wired for RJ46S, and RJ47S. The fourth modular jack style is a modified version of the 6-position jack (modified modular jack or MMJ). It was designed to eliminate the possibility of connecting DEC data equipment to voice lines and vice versa.

15.1 MODULAR PLUG PAIR CONFIGURATIONS

It is important that the pairing of wires in the modular plug match the pairs in the modular jack as well as the horizontal and backbone wiring. If they do not, the data being transmitted may be paired with incompatible signals.

Modular cords wired to the T568A color scheme on both ends are compatible with T568B systems and vice versa.

15.2 STRAIGHT THROUGH OR REVERSED?

Modular cords are used for two basic applications. One application uses them for patching between modular patch panels. When used in this manner modular cords should always be wired ñstraight throughò (pin 1 to pin 1, pin 2 to pin 2, pin 3 to pin 3, etc). The second major application uses modular cords to connect the workstation equipment (PC, phone, FAX etc) to the modular outlet. These modular cords may either be wired ñstraight-throughò or ñreversedò (pin 1 to pin 6, pin 2 to pin 5, pin 3 to pin 4, etc.) depending on the system manufacturerôs specifications. This ñreversedò wiring is typically used for voice systems. The following is a guide to determine what type of modular cord you have

15.3 HOW TO READ A MODULAR CORD

Align the plugs side-by-side with the contacts facing you and compare the wire colors from left to right. If the colors appear in the same order on both plugs, the cord is wired ñstraight-throughò. If the colors appear reversed on the second plug (from right to left), the cord is wired ñreversedò.

15.4 COMMON OUTLET CONFIGURATIONS

Two wiring schemes have been adopted by the ó568-A and ó11801 standards. They are nearly identical except that pairs two and three are reversed. T568A is the preferred scheme because it is compatible with 1 or 2-pair USOC systems. Either configuration can be used for Integrated Services Digital Network (ISDN) and high speed data applications. Transmission categories 3, 4, 5, 5e, and 6 are only applicable to this type of pair grouping.

USOC wiring is available for 1-, 2-, 3-, or 4-pair systems. Pair 1 occupies the center conductors, pair 2 occupies the next two contacts out, etc. One advantage to this scheme is that a 6-position plug configured with 1, 2, or 3 pairs can be inserted into an 8-position jack and still maintain pair continuity. A note of warning though, pins 1 and 8 on the jack may become damaged from this practice. A disadvantage is the poor transmission performance associated with this type of pair sequence. None of these pair schemes is cabling standard compliant.

10Base-T wiring specifies an 8-position jack but uses only two pairs. These are pairs two and three of T568A and T568B schemes.

The MMJ is a unique wiring scheme for DEC® equipment.

16.0 RECOMMENDED CABLING PRACTICES

Doôs

- Terminate each horizontal cable on a dedicated telecommunications outlet.
- Locate the main cross-connect near the center of the building to limit cable distances.
- Maintain the twist of horizontal and backbone cable pairs up to the point of termination.
- Tie and dress horizontal cables neatly and with a minimum bend radius of 4 times the cable diameter.

Dontôs:

- Do not use connecting hardware that is of a lower category than the cable being used.
- Do not create multiple appearances of the same cable at several distribution points (called bridged taps)
- Do not over-tighten cable ties, use staples, or make sharp bends with cables.
- Do not place cable near equipment that may generate high levels of electromagnetic interference.

17.0 UTP CONNECTOR TERMINATIONS

- Pair twists shall be maintained as close as possible to the point of termination.
- Untwisting shall not exceed 25mm (1.0 in) for category 4 links and 13mm (0.5 in) for category 5, category 5e, and category 6 links. Follow manufacturer guidelines for category 3 products, if no guidelines exist, then untwisting shall not exceed 75mm (3.0 in).
- Connecting hardware shall be installed to provide well-organized installation with cable management and in accordance with manufacturerôs guidelines.
- Strip back only as much jacket as is required to terminate individual pairs.

17.1 UTP CABLING INSTALLATION PRACTICES.

- To avoid stretching, pulling tension should not exceed 110N (25 lb*f*) for 4-pair cables.
- Installed bend radii shall not exceed:
    - 4 times the cable diameter for horizontal UTP cables.
    - 10 times the cable diameter for multi-pair backbone UTP cables.

- Horizontal cables should be used with connecting hardware and patch cords (or jumpers) of the same performance category or higher.

- Avoid cable stress, as caused by:
    - cable twist during pulling or installation
    - tension in suspended cable runs
    - tightly cinched cable ties or staples
    - tight bend radii.

- Important Note: Installed UTP cabling shall be classified by the least performing component in the link.

18.0 ANSI/TIA/EIA-569-A

Commercial Building Standard for Telecommunications Pathways and Spaces.

The TIA TR42.3 (formerly TR41.8.3) Working group on Telecommunications Pathways & Spaces published the ANSI/TIA/EIA-569-A (ó569-A) Standard in 1998.
Following are highlights of the ó569-A Standard:

Purpose
- Standardize design and construction practices.
- Provides a telecommunications support system that is adaptable to change during the life of the facility.

Scope
- Pathways and spaces in which telecommunications media are placed and terminated.
- Telecommunications pathways and spaces within and between buildings.
- Commercial building design for both single and multi-tenant buildings.

Elements
- Horizontal
- Backbone
- Work Area
- Telecommunications Closet
- Equipment Room
- Main Terminal Space.
- Entrance Facility

18.1 HORIZONTAL

Pathways from telecommunications closet to work area.

Includes:
Pathway Types:

- Underfloor-Network of raceways embedded in concrete consisting of distribution and header ducts, trenches, and cellular systems.
- Access Floor-Raised modular floor tile supported by pedestals, with or without lateral bracing or stringers.
- Conduit-Metallic and nonmetallic tubing of rigid or flexible construction permitted by applicable electrical code.
- Tray & Wireway-Prefabricated rigid structures for pulling or placing cable.
- Ceiling-Open environment above accessible ceiling tiles and frame work.
- Perimeter-Surface, recessed, molding, and multichannel raceway systems for wall mounting around rooms or along hallways.

Space Types:

- Pull Boxes-Used in conjunction with conduit pathway systems to assist in the fishing and pulling of cable.
- Splice Boxes-a box, located in a pathway run, intended to hold a cable splice.
- Outlet Boxes-Device for mounting faceplates, housing terminated outlet/connectors, or transition devices.

Design Considerations:

- Grounded per code and ANSI/TIA/EIA-607 (ó607)
- Designed to handle recognized media as specified in ANSI/TIA/EIA-568-A (ó568-A)
- Not allowed in elevator shafts.
- Accommodate seismic zone requirements
- Installed in dry locations

18.4 BACKBONE

Pathways routed from closet-to-closet.

Building Backbone Types:

- Ceiling
- Conduit
- Sleeves-An opening, usually circular, through the wall, ceiling, or floor.
- Trays

Typically the most convenient and cost effective backbone pathway design in multi-story buildings, is to have stacked closets located one above the other, connected by sleeves or slots.

Design Considerations:

- Grounded per code and ó607
- Accommodate seismic zone requirements
- Water should not penetrate the pathway system
- Tray, conduits, sleeves, slots penetrate closets minimum 25mm (1 in.)
- Designed top handle all recognized media (as specified in ó568-A)
- Integrity of all fire stop assemblies shall be maintained.

18.3 WORK AREA

Primary location where the building occupants interact with dedicated telecommunications equipment.

Design Considerations:

- At least one telecommunication outlet box location shall be planned for each work area.
- This location should be coordinated with the furniture plan. A power outlet should be nearby.
- Control center, attendant, and reception areas shall have direct and independent pathways to the serving telecommunications closet.
- Furniture System design:
    - Cable access via walls, columns, ceilings, or floors. Fittings that transition between building and furniture pathways require special planning.
    - Furniture pathway fill capacity is effectively reduced by furniture corners, and connectors mounted within the furniture pathway systems.
    - Furniture pathways bend radius shall not force the installed cable to a bend radius of less than 25 mm (1 in.)
    - Furniture spaces designed to house slack storage, consolidation points, or multi-user telecommunications outlet assemblies shall provide space for strain relieving, terminating, and storing slack for the horizontal cables.

- Slack storage and furniture pathway fill, shall not affect the bend radius and termination of the cable to the connector.
- Furniture pathway openings shall comply with either of two sizes:

1) Standard NEMA opening (NEMA OS 1 (Ref D. 14), WD-6 (Ref D. 15))
2) Alternate opening:

Power/telecommunication separation requirements is governed by applicable electrical code for safety. Minimum separation requirements of Article 800-52 of ANS/NFPA 70 (National Electric Code) shall be applied.

18.4 TELECOMMUNICATIONS CLOSETS

Recognized location of the common access point for backbone and horizontal pathways.

Design:

- Dedicated to telecommunications function.
- Equipment not related to telecommunications shall not be installed, pass through or enter the telecommunications closet.
- Multiple closets on the same floor shall be interconnected by a minimum of one (78 (3) trade size) conduit, or equivalent pathway.
- Minimum floor loading 2.4 kPA (50 lbf/ft2).

Design Considerations:

- Minimum one closet per floor to house telecommunications equipment/cable terminations and associated cross-connect cable and wire.
- Located near the center of the area being served.
- Horizontal pathways shall terminate in the telecommunications closet on the same floor as the area served.
- Accommodate seismic zone requirements.
- Two walls should have 20mm (0.75 in.) A-C plywood 2.4m (8ft.) high.
- Lighting shall be a minimum of 500 lx (50 foot candles) and mounted 2.6m (8.5 ft.) above floor.
- False ceilings shall not be provided.
- Minimum door size 910mm (36 in.) wide and 2000mm (80 in.) high without sill, hinged to open outwards, or slide-to-slide or removable, and fitted with a lock.
- Minimum of two dedicated 120V 20A nominal, non-switched, AC duplex electrical outlet receptacles, each on separate branch circuits.
- Additional convenience duplex outlets placed at 1.8m (6 ft.) intervals around perimeter, 150mm (6 in.) above floor.
- Access to the telecommunications grounding system as specified by ANSI/TIA/EIA-607.
- HVAC requirements to maintain temperature the same as adjacent office area. A positive pressure shall be maintained with a minimum of one air change per hour or per code.

18.5 EQUIPMENT ROOM

A centralized space for telecommunications equipment that serves specific occupants of the building. Any or all of the functions of a telecommunications closet or entrance facility may alternately be provided by an equipment.

Location

- Site locations should allow for expansion.
- Accessible to the delivery of large equipment.
- Not located below water level.
- Away from sources of EMI
- Safeguards against excessive vibration
- Sizing shall include projected future as well as present requirement.

- Equipment not related to the support of the equipment room shall not be installed in, pass through, or enter the equipment room.

Design Considerations

- Minimum clear height of 2.4m (8 ft.) without obstruction.
- Protected from contaminants and pollutants.
- Access to backbone pathways.
- HVAC provided on a 24 hours-per-day, 365 days-per-year basis.
- Temperature and humidity controlled range 18° C (64° F) to 24° C (75° F) with 30% to 55% relative humidity measured 1.5m (5 ft.) above floor level.
- Separate power supply circuit shall be provided and terminated in its own electrical panel.
- Minimum lighting 500 ix (50 foot candles). Switch location shall be near entrance door to room.
- Minimum door same as telecommunications closet. Double doors without center post or sill is recommended.
- Access to ground per ANSI/TIA/EIA-607.

18.6 MAIN TERMINAL SPACE

Centralized space that houses the main cross-connect. Commonly used as a separate space in multi-tenant buildings to serve all tenants.

- Location considerations are as specified for equipment room.
- Provisioning area as specified for telecommunications closets except power is reduced to convenience receptacles.

18.7 ENTRANCE FACILITY

Consists of the telecommunications service entrance to the building and backbone pathways between buildings.

Location

- Providers of all telecommunications services shall be contracted to establish requirements.
- Location of other utilities shall be considered in locating the entrance facility.
- Alternate entrance facility should be provided where security, continuity or other special needs exist.
- Equipment not related to the support of the entrance facility should not be installed in, pass through, or enter the telecommunications entrance facility.
- Dry location not subject to flooding and close as practicable to building entrance point and electrical service room.

Design Considerations.

- Accommodate the applicable seismic zone requirements.
- A service entrance pathway shall be provided via one of the following entrance types: Underground, buried, Aerial, Tunnel.
- Minimum one wall should be covered with rigidly fixed 20mm (0.75 in.) A-C plywood.
- Minimum lighting same as telecommunication closet.
- False ceilings shall not be provided.
- Minimum door same as telecommunications closet.
- Electrical power same as telecommunications closet. No convenience receptacles mentioned.
- Grounding same as telecommunications closet.

18.8 MISCELLANEOUS

- Fire stopping per applicable code
- Horizontal pathway separation from Electromagnetic interference (EMI) sources:
    - Separation between telecommunications and power cables (Article 800.52 of ANSI/NFPA 70)
    - Building protected from lighting (ANSI/NFPA 780 (Ref D.4)
    - Surge protection (Article 280 of ANSI/NFPA 70 and 9.11 of ANS/IEEE 1100 (Ref D.1)
    - Grounding (ANS/TIA/EIA-607)
    - Corrected faulty wiring (Section 7.5 of ANSI/IEEE 1100)
- Reducing noise coupling:
    - Increase separation from noise sources
    - Electrical branch circuit line, neutral, and grounding conductors should be maintained close together.
    - Use of surge protectors in branch circuits
    - Use fully enclosed grounded metallic raceway or locate cabling near grounded metallic surface.

19.0 TIA/EIA-569-A-1

Perimeter Pathway Addendum

This addendum deals with the constriction, applications, premises design and installation of perimeter pathways also known as surface raceway systems.

It describes both single and multi channel systems mounted on walls s at a variety of heights and directions. The sizing of such pathways are based on 40% fill for initial installations but allows up to 60% fill for moves adds or changes to the installed cabling system during its life cycle. Fitting for perimeter raceway systems must allow for the band radius requirements of the installed cable.

20.0 TIA/EIA-569-A-2

Furniture Pathway Fill Addendum.

The sizing of such pathways are based on 40% fill for initial installations but allows for up to 60% fill for moves, adds and changes to the installed cabling system during its life cycle. Furniture fittings such as outlets and connectors used to terminate the installed cables need to be considered when determining the percentage of fill. Fish and pull techniques may result in reduced capacity of the pathway as compared to furniture manufacturers which allow placing cables into the pathways.

20.1 SP-4198

Revision to subclause 4.3, “Access Floor”, of TIA/EIA-569-A

Introduces low profile floors as compared to standard height floors. Low profile floors are 6ò or lower while standard height floors are 6ò or greater. This revision describes the use of access floors as it refers to guidelines and installation.

20.2 SP-4517

Addendum 4 to ANSI/TIA/EIA-569-A Poke-Thru Devices

A poke-thru is a device for routing cables through a floor while maintaining the fire-rating integrity of the floor. These devices are an option for routing horizontal cables when other pathway types are not typical. Types include flush floor mount and those that rise up above floor level, also known as pedestal, raised, tombstone or monument.

PART E:

TECHNICAL SPECIFICATIONS

FOR

SECURITY MANAGEMENT AND ACCESS CONTROL SYSTEM

PART E:

TECHNICAL SPECIFICATIONS FOR SECURITY MANAGEMENT AND ACCESS CONTROL SYSTEM

CONTENTS

1.0 GENERAL TENDER REQUIREMENTS

1.1 The tenderer shall include for the design, cost estimation, supply and commissioning of a complete, integrated access control and alarm point monitoring system, compliant with the technical and performance criteria set out in this document.

The system shall broadly comprise the following:

a) A central administration computer (PC) for the system administration, addition and editing of tokens/cards, report generation and acknowledgement of system alarms.

b) Door controllers and accessories.

c) Readers, door monitoring contacts and exit switches.

d) Alarm control functions on fire doors and other auxiliary alarm points.

1.2 The tenderer shall supply a complete and functionally working system including all control equipment, hardware and software, cabling and ancillary services. The tenderer is to make himself familiar with all matters related to the system, its requirements and installation.

1.3 The tenderer shall seek clarification of any relevant matters (insert a suitable contact name and telephone number).

1.4 After the tender has been awarded there shall be no price variation without prior agreement.

1.5 A complete clause by clause compliance response is required.

1.6 The systems control software and hardware shall be designed, manufactured and originate from reputable manufacturers, who shall comply with BS EN ISO 9002 or such equivalent standard in the country of origin.

1.7 The tenderer shall demonstrate his competence with the equipment he is tendering by either:

The tenderer shall obtain a letter signed by a company director or head of training from the original equipment manufacturer. The letter must state the name of tendering company and a statement to the effect that the tenderer is of sufficient competence to install the tendered equipment.

The tenderer shall provide proof in the form of training certificates from the original equipment manufacturer. Certificates will contain named individuals and the course applicable to the equipment being tendered. The named individuals must be employed by the tenderer and play an active part in the installation of equipment.

2.0. GENERAL SYSTEM FUNCTIONALITY

2.1 Access Control Architecture

i. Client-Server Architecture

The Security Management System should support configuration in a client/server architecture.

In a client-server architecture, all data resides in the central database and client workstations connect to the database via the network.

The Operators and System Administrators login to the system from the client workstations in the network. This physical separation of the central database and the clients allows central administration of data with users working with a current database state.

ii. Open Platform Architecture

An SMS system based on a true open architecture design will support industry standards for databases, servers, networks, input and output devices.

Input devices in this case can include

- Readers
- Data capture systems e.g. passport scanners, Webcams and connected cameras, Business Card Scanners
- Output devices include printers and other third party systems.

iii. Licensing

The SMS should support **Concurrent Licensing as opposed to per seat licensing**.

Concurrent licenses allow the access control client application to be installed on an unlimited number of workstations in the Organization. Any of the client workstations that have the SMS software installed shall have the ability to connect to the database server as long as the maximum number of concurrent connections purchased has not been reached. Example, with concurrent licensing, you can install the client application in 50 client workstations but only 5 can connect to the database server concurrently.

Concurrent licensing provides CAK with greater flexibility in system design and layout.

iv. Distributed Intelligence

The Security Management System should allow for **Distributed Intelligence** configuration that eliminates a single point of failure and ensure continuity of operations.

In this architecture is an Intelligent Controller with an embedded web server and RDBMS that stores a copy of the access control database and is always synchronized with the Database Server to obtain the latest cardholder database information. The Intelligent Controller has a ñbrainò and makes decisions in the access control system based on the data in the database.

When the Intelligent Controller loses network communication to the database server, it continues to make all access decisions and when communication is re-established, all the data will be uploaded to the database server without manual intervention by the operator. This would also allow for multi-site, multi-region installations, to any location with a permanent or intermittent network or dialup connection.

The Controller should be intelligent:

- Knowing the time/date stamp of the last record/table update in its memory
- Requesting any new data changes or cardholder records which have changed since that time/date stamp. This prevents data duplication.

The Controller should therefore have a large enough buffer. In case of prolonged communication outage when recovery time is longer than planned, during the upload an intelligent controller should notify the system operator that some events in itôs buffer events were overwritten.

v. Redundant Server Architecture

The Security Management System should support redundant operations to support continuity of operations and eliminate a single point of failure. This should be supported via:

Server clustering and HA Standby

In server clusters, the system utilizes two servers, which are configured identically. One server shall be designated as the Primary Server and the other shall be designated as the Backup Server. The Primary Server shall be the main server that is in use when the SYSTEM is operating under normal conditions.

When the primary server fails, the system operations automatically switches over to backup server without any operator intervention.

Disk Mirroring

This allows data to be stored on dual hard disks running simultaneously.

When the primary hard drive fails, the secondary hard drive continues to operate while a warning message is sent to operator.

Fault-tolerant RAID 10

This technology uses multiple drives to store data with distributed parity, thereby ensuring data protection in an environment in which data is safe and easily restorable in the event of a hard disk failure.

In the event a single drive within the array fails, a "Hot Standby Hard Disk" is available online and automatically switched with the failed unit. You can then replace the failed drive without taking the database server down, and it shall then become the hot standby.
The RAID software shall then rebuild the lost data from parity information stored on the other drives in the array.

vi. Encrypted Communications

The System should be able to protect both data at rest (in the database) and data in motion (data across communication channels).
The communications between the reader and the Intelligent Controller and the communications between the Intelligent Controller and the Database Server should be encrypted to prevent unauthorized disclosure of the personal information to a sniffer.
Approved and certified encryption standards such as AES should be supported.

2.2 Personnel and Credential Management

i. Enrollment

The Security Management System should provide an integrated enrollment module for users.
The system should provide an integrated Forms Designing and Editing feature/module that gives System Administrators the ability to modify any standard field to customize any or all of the cardholder, asset, or visitor forms. The system shall also allow System Administrators to add custom fields in addition to any standard fields.
Custom fields allow the organization to collect pertinent data about cardholders (employees, visitors, contractors etc) as per the security policy.

ii. Credential types/authentication factors

The Security Management System should support all available authentication factors in the industry including PIN, Cards, Key fobs and Biometrics (Fingerprint, Face, Palm, Hand geometry, Voice, Iris)
For PINS, the system should supported PIN lengths from 4-9. The system should support and detect duress PINs.
The various card credential types should be supported including: Magnetic Card (eM) and Proximity Card types (MiFare, iClass, HID Prox etc)
The system should also support Multi Factor Authentication - allowing combination of the various authentication factors for hardened security.
The system should support Biometric-on-card for smart cards.
The system should support designation of and detection of duress fingerprints.

Support of multiple credential types will allow different credentials to be implemented on the same system based on security needs. It will also allow different reader types to be installed and supported.
In addition, support for multiple credential types can also allow for a phased transition of the current access control system.

iii. Data Capture

The system should allow Communications Authority of Kenya flexibility in how to capture user data. Systems can include:

- Webcams or Live video feeds. The system should provide capability to manually or automatically crop the image.
- Since live video feeds generate large size images, the system should support industry standard compression techniques to reduce image sizes.
- Image scanners.
- When capturing the userôs photo, the system should allow you to capture a new photo without affecting/replacing the current photo in the database.
- importing images from a PC/Storage device in standard industry format (e.g. jpeg, png, photoshop, bitmap)
- Signature Capture using Penware tabs
- Integrating a business card scanner to capture details and automatically populate the fields on the access control software
- Integrate scanner for Smart IDs such as digital passports, smart ID cards, and automatically populate fields.

2.3 Electronic Key/Card

1.0 The access control system shall be based on a non-contact proximity reader technology. The method of operation shall be based on electro-magnetic induction.

1.1 The token shall be capable of being attached to a key ring and shall be read when held amongst mechanical metal keys. The token shall carry a minimum of 15 years manufacturer's guarantee against electronic failure.

1.2 The token shall be a credit card sized flat card and have a thickness of no greater than 1.3 mm. The card shall have an option of a high coercivity magnetic stripe and shall allow the printing of a photo ID directly on to the surface of the card. The card shall carry a lifetime manufacturer's guarantee against electronic failure.

1.3 The token shall not contain a battery.

1.4. **Card Security**

a. Card security features

The system should support advanced card security features to protect cards from reproduction and falsification. These can include Chroma Keys and Ghosting.

Chroma key - Chromakey is the process of removing a solid background from a captured image. Chromakeyed photos are very difficult to reproduce or falsify.

Ghosting - ghosting feature is whereby the system makes the cardholderôs photo semi-transparent to create a ghosting effect. Ghosted images are very difficult to reproduce and falsify. 25 ghosting levels should be supported, from 0 (no ghosting) to 255 (invisible).

b. Card status

The system should support activation and deactivation dates.
The system should support designation of cards as Lost, Active and Deactivated.
If a lost card is used at any reader, the system should generate an alarm on the alarm monitoring window.
When the badge status is changed, all of the cardholderôs linked network accounts automatically shall disabled.
The system should have an automatic credential deactivation function whereas a cardholderôs credential will automatically deactivate after an extended period of inactivity. System Administrators should have the ability to reset credential status at a later date.

1.5 **Grant/Deny Access by the Control room security personnel,**

The system should have the ability to launch a window when a request for access is made through the system based on specific criteria (such as multiple access denied events, or via an intercom trigger on specific doors), where the control room operators can either grant or deny access to the door via the system. This event will be logged and assigned to the operator who is performing the action.

1.6 **Real-time transaction window and real-time printer**

The system shall have a window where it is possible to display all transactions. It must also be possible to route transactions to a real-time printer. The types of transactions that are displayed or printed may change throughout the day and on different days of the week. For example, some transactions will be displayed only during normal working hours. Outside normal working hours those same transactions may be required to be displayed and printed. It shall be possible to fix the transaction window so that it is always "on top" of all other windows.

3.0 READER AND READER HOUSING

3.1 The readers shall be a designed for general purpose use and be suitable for interior or exterior installation. They shall be slim units with a pleasing appearance that blend in with most installation requirements. Ideally the units shall be made of flame retardant plastic. All readers will carry a lifetime warranty against electronic failure.

3.2 Two sizes of standard reader are required:

a) Surface mounted to fit a standard UK single gang electrical back box with 60 mm screw spacing. The reader shall have dimensions no greater than:

86 mm (H) x 86 mm (W) x 15 mm (D)

b) A slimline reader to be mounted on door mullions is also required. It shall have dimensions no greater than the following:

130 mm (H) x 40 mm (W) x 15 mm (D)

3.3 The readers shall be capable of internal or external mounting without additional environmental protection. All reader types must be of a fully potted assembly and capable of being mounted on exterior walls without additional weather protection.

3.4 All readers shall be capable of being mounted on a metallic surface or behind non-metallic materials without any adverse effect on the ability to read the token.

3.5 Reading of the token shall be 100% reliable with no misreads. There shall never be a need to present the token to the reader a second time.

3.6 The reader cabling shall use multi-stranded unscreened six core cable and the reader shall be capable of operating up to 1,000 metres from its control unit without the need of an additional power supply. Cable from the reader shall be permitted to run next to mains carrying conductors without adverse effect.

3.7 The reader shall incorporate tamper detection to signal that the connecting wires have been broken. This shall be achieved without the use of a tamper switch.

3.8 The reader shall incorporate an LED(s). The LED(s) will operate in the following manner:

- LED is constant red when door is closed and secure.
- LED turns green on successful access and remains green until the door lock is re-secured.
- LED(s) flash when an unsuccessful access attempt has been made.

and/or

Vandal Resistant Readers

3.9 Vandal resistant readers are to be manufactured from brushed finished stainless steel. The stainless steel shall be of no less than 16 gauge (1.6 mm) and to BS 1449 grade 304.

3.10 The reader shall be fixed with a key symbol on its front and its dimensions shall be no greater than the following:

100 mm (H) x 100 mm (W) x 16 mm (D)

3.11 It shall be secured with non-standard tamper proof screws.

and/or

Vandal Resistant Brass Readers

3.12 Vandal resistant readers are to be manufactured from lacquered brushed finished brass. The brass shall be of no less than 12 gauge (2 mm) and of CZ 108 half hardened to BS 2870.

3.13 The reader shall be fixed with a key symbol on its front and its dimensions shall be no greater than the following:

100 mm (H) x 100 mm (W) x 16 mm (D)

3.14 It shall be secured with non-standard tamper proof screws.

and/or

Token and PIN Reader

3.15 For more sensitive areas a higher security level may be required. In these areas a token and personal identification number (PIN) reader shall be used. The mode of operation shall be such that a token only can be used or token and PIN. This shall be automatic and programmable from the reader's door controller or the administration PC.

3.16 The reader shall be finished in stainless steel surround and shall be flush mounted with the following maximum dimensions:

144 mm (H) x 100 mm (W) x 35 mm (D) and protrude no more than 5 mm from flush.

OR

3.17 The reader shall be finished in lacquered brushed finished brass surround and shall be flush mounted with the following maximum dimensions:

144 mm (H) x 100 mm (W) x 35 mm (D) and protrude no more than 5 mm from flush.

OR

3.18 The reader shall be finished in stainless steel and shall be surface mounted with the following maximum dimensions:

200 mm (H) x 100 mm (W) x 30 mm (D)

OR

3.19 The reader shall be finished in lacquered brushed finished brass and shall be surface mounted with the following maximum dimensions:

200 mm (H) x 100 mm (W) x 30 mm (D)

4.0 SYSTEM CONTROLLERS

4.1 The access control system must be of high integrity and therefore must employ system controllers with fully distributed intelligence with no degraded mode of operation. There shall be no loss of functionality in the event of communications interruption. The relationship of door contact inputs, auxiliary inputs and system alarms to relay outputs must be maintained at all times. Systems that have a degraded mode of access in the event of communications interruption, especially any that will allow access by site code only will not be accepted.

OR

4.2 The system controller shall store up to 5000 transactions and have the ability to be connected to a modem via a build in serial port. The door controller shall have the ability to have keys added and deleted by a remote PC over the public telephone network.

4.3 The door controller shall unlock the controlled door within 0.3 seconds from the completion of a valid access attempt. It should be possible to lengthen others, or shorten, this time duration through the PC administration System

4.4 The system controller shall report the following to the PC administration system:

Access Authorised
No Access - Level
- Locked Out
- Time
- Unknown ID
- Visit Time

No Entry - Passback
No Exit - Passback
Entry Authorised (for anti-pass back doors)
Exit Authorised (for anti-pass back doors)

PIN Reader Duress
Incorrect PIN

Exit Out of Hours

Repeated Key Use
Request For Exit
Request For Entry

4.5 The reader technology offered shall be non-contact smart card. The principle of operation shall be electro-magnetic induction. The door controller must also support other reading technologies.

4.6 The door controller shall have an option of an in-built user interface comprising of a keyboard, display and administration reader. The keyboard shall have at least 40 individual keys consisting of the ten numeric and 26 alphabetic characters. The display shall be of at least 16 characters and shall be clearly visible in darkness.

4.7 The user interface shall display the state of any attached auxiliary inputs and any alarms that occur within the door controller. If communications are interrupted to the controller then an audible sounder will sound and a short English language description of the alarm displayed. The sounder may be silenced by a nominated editor or master token being presented to its administration reader.

4.8 All events must be DATE and TIME stamped at the door controller as they occur.

4.9 The system must maintain a system clock and all door controllers must be automatically synchronised for DATE and TIME at least once a day.

4.10 To ensure the integrity of the system if power to the door controller is lost (both mains supply and back-up battery) then the controller's data must be maintained in non-volatile memory. If communications are interrupted before power failure then all events must be maintained.

4.11 The door controller must have a limitless event transaction log that stamps the time and date at source and not when received by the central controller.

4.12 To increase reliability, the lock outputs shall be a solid state device and not a relay. The solid state device must have a selectable output, capable of sourcing power to its attached lock at 12V DC at 1 Amp or 24V at 0.5 Amps continuous.

4.13 The solid state lock output must be protected against short circuit and overload.

4.14 Anti-pass back shall be implemented within the controller. Pass back between the two doors shall not be affected by communication interruptions.

4.15 Timed anti-pass back shall be available so that a token holder violating the pass back rules shall be refused access for a minimum of ten minutes after his next attempt to gain access.

4.16 When turnstiles are used the door controller set-up shall be selectable so that the IN reader can operate one lock output and the OUT reader another lock output and yet be reported as the same turnstile. Alternatively the door controller set-up shall be selectable so that both readers can operate the same lock output.

4.17 The door controller shall include an integral power supply. This power supply shall have sufficient capability to deliver power to the controller and up to four readers. It shall also provide power for up to four locks continuously rated at 12V DC at 1 Amp or 24V DC at 0.5 Amps. The power supply shall in addition provide sufficient charge for two 6.0 Amp hour standby back-up batteries.

4.18 The controller shall monitor its readers for cable tamper.

4.19 Visitor tokens are required. These shall be the same as personnel tokens but be allocated a start and finish date for their validity on the system.

4.20 The door controller shall have a minimum of four auxiliary output relays. These relays shall be programmed via the Server administration system to respond to auxiliary inputs or door controller alarms. Each relay may be operated according to a time profile.

4.21 Each of the door controller's four doors shall have a door contact input. This input shall be used to indicate the following:

Unauthorised Access
Door Left Open
Door Closed

The door contact shall also indicate to the system when the door has been opened and closed after an authorised access or request to exit operation. Closing the door shall cancel any unused lock release time.

If anti-pass back is being used on a door, then an authorised access transaction is not reported until the door has actually opened.

4.22 The door controller shall be mounted in a secure metal cabinet of sufficient size to enable easy cable handling and room for at least two 6.0 Amp hour back-up batteries. It shall have dimensions no greater than:

450 mm (H) x 450 mm (W) x 100 mm (D)

4.23 The door controller shall be programmable so that any controller can be configured to be a network master controller, a network slave controller, a dial-up remote master, or a stand alone door controller.

4.24 **Remote sites with link to central network controller**

The system controllers for other sites MUST have the ability of being connected to the system by a link.

4.25 **Alarm dial-back on remote dial-up sites**

These two sites that are connected by link shall have the ability to call the central network controller at any time in the event of an alarm occurring at the remote site.

5.0 ALARM MONITORING

5.1 Alarm Event Managers (AEMs) shall be supported and shall be attached to the door controllers from which they derive their power. There shall be at least one AEM per reader channel. The AEM shall manage all auxiliary alarms and auxiliary relay outputs.

5.2 The AEM shall have a minimum of eight, four state inputs and eight switchable relay outputs. The relay contacts shall have a rating of no less than 2 Amps at 30 VDC or 0.4 Amps at 125 VAC. The inputs shall be selectable to be normally open or normally closed. The AEM must distinguish four states for each input. The input states are: Normal, Active, Open circuit and Short circuit.

5.3 Any of the door controllers 36 possible relay outputs (four AEMs and four onboard relays) can be activated by any event within the door controller.

5.4 Each relay output shall be programmed so that it can be operated by at least four separate events.

5.5 The AEM shall be fitted with a test button and an LED display so the states of each of the eight inputs can be displayed. The LED display shall indicate if each input is normal, active, short or open circuit. It shall also display the state of the case and reader tampers.

5.6 Each input shall have a name field of 45 characters and a description of each input that shall be no less than 300 characters long.

5.7 Alarm Inputs shall be able to be grouped according to area and will be able to be manually disabled via the central administration system, or alarms can be automatically activated or de-activated by the use of a time profile.

5.8 Alarm Inputs shall be able to be grouped according to area and can be enabled and disabled

5.9 An input shall also be able to be configured as a 24 hour input and will always be active.

5.10 Each input must have the ability of being configured as normally open or normally closed. Inputs will usually have four states, but may also be required to have two state inputs. Further alarm functions shall include "Acknowledge Required" and "Relay Follows Input". A graphic bit map may also be attached to each input and displayed when the alarm is being accepted.

5.11 To prevent the system being flooded by erroneous alarms a re-arm count shall be available. This shall be programmable so that from one to five alarm activationõs within a time period will be transmitted as an alarm but and any alarm activation's after that will be ignored and the input described as being in an alarm state. The re-arm count will be reset once the alarm input is dis-armed and re-armed either manually or automatically by a time profile.

5.12 The AEM shall be housed in a 1.2 mm mild steel enclosure painted with an epoxy coating complete will tamper switch. It shall have dimensions no greater than 184 mm x 148 mm x 38 mm.

5.13 The AEM shall have a maximum cable distance from its door controller of no less than 500 metres.

5.14 **Alarm and Event Management**

i. Alarm/Event Monitor

The system should provide an Alarm Monitoring window to allow for monitoring of the system controllers, alarm inputs, alarm outputs, and card readers and other 3rd party connected devices.
The system should allow for automatic update of the list of hardware devices as they are added, modified or deleted with newly configured devices and changes to existing devices shall be reflected in the hardware list automatically.
Alarm Monitoring client workstations shall be configured to annunciate any or all of the following types of alarms: access granted alarms, access denied alarms, system alarms, emergency alarms, and/or area control alarms.

ii. Alarm/Event Management

The system should give System Operators the ability to filter out alarm types from the Alarm Monitoring window that they do not wish to monitor. Alarms that should be filtered from the Alarm Monitoring window should include access control system alarms, asset alarms, intrusion detection alarms and other integrated 3rd party system alarms.
The system should support Alarm aggregation - a mechanism of combining several alarms into a single item (group) based on certain criteria and performing operations on the group of aggregated alarms such as acknowledgement and deletion.
The Alarm Monitoring window should provide a status indicator that displays the current status of alarms, card readers, system controllers and other integrated 3rd party devices including pending alarms, offline devices etc.
The system should allow color coding of alarms. The alarms are to appear on the Alarm Monitoring window with a flashing colored bar across the alarm for alarms configured as high priority. The color shall be based on the alarmôs priority as defined by the System Administrator. The System Administrator should be able to assign a unique color to each alarm priority or a range of priorities as desired.
The system should also support Color Coding for Acknowledged Alarm Priorities.
The System Administrator should have the capability to configure how the system handles the annunciation of alarms e.g.

- Display on the Alarm Monitoring client workstation.
- Allow higher priority alarms to be displayed on the Alarm Monitoring client workstation ahead of lower priority alarms.
- Have a customized voice message annunciate at the client workstation
- Require that the alarm not be deleted from the Alarm Monitoring window upon acknowledgment.
- Display text and audio instructions outlining the procedures to follow when responding to Automatically call-up associated maps upon arrival
- Require System Operators to enter in a password to view the alarm or to acknowledge the alarm.
- Automatically send an e-mail message to one or more email recipients.
- Activate an Action Group ï This feature shall allow the System Operator to execute an action group, which shall include one or more actions.

Alarm acknowledgment should present the System Operator with various alarm acknowledgement choices, configurable to suit the Organization policies including:

- Review instructions or procedures to follow for the alarm
- Make a journal entry
- Acknowledge the alarm
- Listen to audio instructions
- Print the alarm and instructions to a local printer
- Review any previous journal entries for this alarm.

The system should support annunciation of unacknowledged alarms e.g. unacknowledged alarms be automatically displayed in a pop-up window after a pre-defined time period lapses.
The system should support floating alarm monitoring windows.
The system should provide an interface to view only pending alarms.

iii. Test Instructions

The system should allow for a set of text instructions to be associated with each alarm
that arrives into the system. This will allow the System Administrator to define the Standard Operating Procedures for alarm handling. Each alarm or event in the system shall have its own unique set of text instructions should the System Administrator desire.

iv. Voice instructions

The system should allow for a customizable voice instruction to be associated with each alarm that arrives. This feature shall allow the System Administrator to record a voice instruction of unlimited length. This voice instruction should explain the procedures to follow once the alarm has been selected for acknowledgment at the Alarm Monitoring client workstation. Each alarm or event in the system can have its own unique customizable voice instruction is desired. The system should allow both a text instruction and a customizable voice instruction to be associated with each alarm/event configured. The system should allow the use of pre-existing wave (.wav) files for customized voice instructions.

v. Voice Annunciation

The system should allow for a customizable voice annunciation to be associated with each alarm that arrives into the system to be used as an additional attention grabber for high priority alarms.
This annunciation shall also be user configurable to repeat in user-defined one second increments until the alarm is acknowledged. This feature should have the ability to be ómutedô at the Alarm Monitoring client workstation at the System Operatorôs discretion.

vi. Alarm/Event Routing

The system should be capable of allowing System Administrators to route alarms and events to various Alarm Monitoring client workstations on the network.
The system should also allow for the System Administrators to automatically have alarms re-routed from one Alarm Monitoring client workstation to another Alarm Monitoring client workstation if a system operator has not responded to the alarm within a specified amount of time.
The system should have network synchronization so that if an alarm/event is routed to multiple client workstations, once the first client workstation ógrabsô the alarm, the alarm/event shall be cleared from all other client workstations.

vii. Input/Output Linkage

The system should support a linkage feature whereby any input/output/event shall be linked to any other input/output/event in the system. Input/output Linkages shall be able to span across system controllers. An input/event may trigger multiple actions and an action list should have the ability to be triggered by multiple inputs/events.

viii. Mustering and Destination Assurance

i. Mustering

The system should support advanced Mustering functionality that provides an automatic capability for registering cardholders that are on site during an incident.
Designated exit and entry card readers shall be used to enter and leave hazardous locations and safe locations. When an incident occurs, a Muster Report shall be generated that consists of a listing of all personnel that are within the hazardous locations as well as all personnel that have registered in a safe location.

ii. Destination Assurance

The system should provide an advanced destination assurance feature that reports instances of cardholders not going directly to their required locations after entering a specified card reader checkpoint. Once a cardholder passes through a checkpoint reader, that cardholder shall have a predefined amount of time to reach his or her destination card reader.
Destination Assurance proves beneficial for entry and exit readers at hazardous locations, for example, where an alarm can be generated if a cardholder has not exited the hazardous location within a given length of time.

ix. Guard Tour

Tour checkpoints shall be ordered in the sequence within which they are to be visited. Tour checkpoints shall be assigned minimum and maximum times within which to be reached. The system should support placing checkpoints on a graphical map.
Tours shall be optionally scheduled for a specific time or recurring time.

x. Activity Logging

The system should log activity of System Operators performing system wide alarm monitoring; that is, alarms acknowledged, cleared, output control activity, trace, and other functions.
The system should permit the System Administrator to define the number of daysô worth of activity to keep online (data retention period) before the System Administrator purges the oldest data offline.

xi. Email Interface

The system should support an e-mail interface seamlessly integrated within the Alarm Monitoring application and allow sending of emails from the application

6.0 ACCESS CONTROL / ALARM INTERFACE

6.1 Alarm interface managers (AIMs) shall be attached to the door controller and alarm panel. There shall be at least one AIM per two reader channels.

6.2 The AIM shall allow assigned security tokens to arm or disarm the linked alarm panel.

6.3 Ordinary keyholders shall be able to gain entry at the main entrance to the premises once the security keyholder has disarmed the alarm.

6.4 There shall be the facility to disable perimeter doors when the panel is armed by the use of reader inhibitor modules.

7.0 CENTRAL NETWORK CONTROLLER

7.1 The Central Network Controller (CNC) shall be located with the PC Administration system. It shall manage all communications to the door controllers. Connection to the local door controllers shall be via a LAN network. Remote sites shall use link already provided. The CNC shall manage all local and dial-up communications independently of the PC Administration system.

7.2 The time clocks of all controllers on the system, whether local or remote, shall be synchronised by the central network controller automatically at least once a day or manually by an authorised operator as required.

7.3 It shall be possible to connect up to twenty CNCs to the system. The system shall have the possibility of expanding.

7.4 As resilience and integrity of the system are of paramount importance the system shall have a distributed topography so that not more that four CNCs or master door controllers are connected to any work station or file server of the PC administration system. If the PC network fails then CNCs or masters connected to its associated work station will continue to function, gather transactions and announce alarms.

8.0 PC ADMINISTRATION SYSTEM

8.1 The administration system shall be based on PC's running under the latest software. In general the system shall be simple to use and to operate. System Administrative tasks such as defining client workstation and System Operator permissions set-up, access groups, timezones, reports, maps, etc. shall be provided from any client workstation on the network.

8.2 The PC shall not be solely dedicated to running the access control software. It must be possible to run other Windows programs such as word-processing or database programs on the PC at the same time. However any alarms that occur on the access control system must be presented over those other applications without delay. Other programs that are running will be put into the background, but data and information must not be lost.

8.3 The software shall be simple to upgrade and easy to expand from a small single site to a large multi-site, multi-PC system.

8.4 Password Management

The SMS system should allow CAK to enforce strong password management rules.
The SMS system should support **single sign-on (SSO) capability**. This allows System Administrators or System Operators to authenticate into SMS applications using their Windows domain account.

System Administrators and Operators shall have the ability to change their password at any time in the SYSTEM by logging into the SYSTEM with their current password and then changing it through menu options.

8.5 User Permissions and Privileges

The System shall allow the System Administrator to configure each client workstation with those applications that may be run on that client workstation. Individual System Operator passwords will further restrict System Operator functions and shall be specific to each System Operator. Specific System Operator restrictions shall include:

- Access to screens or functions (for example: alarm monitoring, badge issue)
- Specific tasks allowed (for example: modify data, view only)
- Alarm Monitoring functions (for example: clear alarms, output control, traces, reports)

If a System Operator is denied access to specific functions, those functions shall not appear (or shall be ghosted) on the System Operatorôs client workstation or menu bar while that password is logged in.

The system should be able to provide information on the date and time a new System Operator was created and the date and time the System Operator information was last modified.

The system should provide the user a clear method to view and control permissions. It should allow the ability to view everyone that has access to a permission. To view permissions, the system shall include the features of compare, search, and export. There should be permissions reports.

8.6 Credential Management

1. Access Privileges

a. Access Levels

Access level defines the permission granted to access a resource e.g. a door. Access levels specify the allowed doors/offices and times.
A summary screen shall be provided for review of access level configurations.

b. Access Groups

Access Groups feature allow grouping access levels together for ease of assignment of access levels to cardholders. Once a user is made a member of that group, they inherit those rights.

c. Timezones

Timezones define the allowed time periods when the card can be used across the facility.

d. Holidays

Holidays feature allow the Systems Administrator to designate dates as holidays with the system supporting holidays that span across calendar days.

The system should support an embedded calendar in which System Administrators can select the Holiday dates.

Holidays should be able to be configured to repeat yearly.

Access levels should allow any staff member to access any door on any site with access privileges assigned or revoked as needed.

8.7 **Encrypted User-defined fields**

The data in the database should be protected against unauthorized disclosure.
The SMS should encrypt all cardholder PIN codes such that no one, including the Systemôs Administrator, shall have access to cardholder PIN codes through the application or through the database server.
Passwords shall not print in any report.
Based on the defined operator permissions and privileges, an operator should also not be able to view data they have not been granted privileges to access.

8.8 **Activity Logging**

The system should provide full access/alarm/event activity logging. The activity log shall provide comprehensive logging of date and time of the transaction, where the transaction occurred, acknowledgment information, and any system Operator actions.
The system shall log all access grants, access denies, alarm activities, asset denies, and
other critical and non-critical alarms. The system shall give system Administrators the ability to choose when to log certain types of alarms.
The system should provide full System Operator activity tracking of critical keyboard functions. The activity log shall be comprehensive, recording the date and time of the activity, the client workstation at which the activity was performed, the System Operator who performed the activity, the program the activity occurred in, and the function that was performed within it. The system shall record any and all changes to the database made by all System Operators.
The system should log all System Operator functions, including System Operator Log-in and System Operator Log-out; Additions, Changes, and Deletions to Cardholder Management; New Badge, Print Badge, and Update Badge; and other critical database functions.
The system should log changes made to the access control configurations: Changes of access levels, holidays, timezone changes, card readers, and other critical items.
The system should permit the System Administrator to define the number of daysô worth of activity to keep online (data retention period) before the System Administrator purges the oldest data offline.

8.9 **Alarm Monitoring and Graphical Maps**

The system should support real time graphical maps that should be configured to appear in the Alarm Monitoring client workstations either on command or when specified alarms are selected for acknowledgment. With graphical maps, the system should give System Operators the ability to acknowledge alarms from the graphical map without going back into the Alarm Monitoring window.
Standard map formats should be supported, including: Adobe PhotoShop, AutoCAD DXF, JPG, TIFF, Windows Bitmap, Windows Metafile etc.
The system should support map hierarchies or maps within maps. There should be no limit to the number of maps that can be nested hierarchically with each other.
The system should support user-defined icons for field hardware devices. The system should also give System Operators the ability to affect the mode of card readers, open doors, mask/unmask alarm inputs, activate an action group, and activate/deactivate/pulse an output from the map icons.

8.10 **System Tree**

A graphical system overview tree should be available to depict a graphical representation of all field hardware (including controllers and other integrated devices such as intruder detection devices), access levels, timezones, access groups, holidays, and card formats that have been configured in the system.
If System Administrators wish to modify a device that is depicted on the graphical system overview tree or see its properties, they should be able to double-click on the icon and the system shall bring them to the appropriate form.

8.11 **System Reports**

All reports must be stored in the system database and must be able to be viewed from any system client workstation with proper permissions.
The system should allow the System Operator to e-mail reports based on system events or on a user-defined schedule.

Standard reports should include:

- Access Denials, grants by Reader, Badge
- Cardholder Exit/Entry reports
- Cardholder photos with names
- Cardholder Time and Attendance reports
- Area entrance history
- Device status reports
- Access Groups and Access Groups with Levels
- Permission profiles
- Anti-passback configuration report
- Access Level Assignments to Cardholders Report
- Events reports including Anti-passback events
- Elevator reports including Elevator Access denied, granted and floor assignments reports
- Maps reports
- Alarm configurations reports
- Alarm acknowledgements with acknowledgement notes, by System operator
- Guard tour configurations
- Guard tour history
- Reader Command Programming Configuration
- Text Instructions and Acknowledgment Notes
- Timezones reports
- System operator transaction logs
- Visitors and Visit histories

8.12 **Custom Reports**

The system should support an industry-standard, off the shelf, custom report writer, such as Crystal Reports and support multiple report types including, but not limited to, multiple section reports, form style reports, conditional reports, query reports, and columnar reports.
The custom report writer should be compatible with industry-standard SQL databases.

8.13 **Multiple Workstations**

The system shall have the capacity for several workstations including the main administration PC. These PC's shall be connected by a network.

8.14 **System Divisions**

The system may be split into 'divisions'. A division shall be a set of one or more sites. Each division will have its own personnel records, token and access information which will be stored in the door controllers on the site.

Using divisions will simplify the administration of systems with a large number of sites and token holders. Token holders shall be able to exist in more than one division with the same ID device.

The administrator shall be able to restrict system operators as to which divisions they can edit and view database information. The system shall allow each PC on the system to be configured so as to only display transactions and alarms from designated divisions.

8.15 **Detailed on-line Help**

The system offered must have an on-line help facility. This shall provide details of all functions that the system can perform. It is considered imperative that the Help facility is context sensitive in that the Help menu or information given is relevant to the task the operator is performing.

8.16 **Editing and Administration reader**

Each PC or workstation on the system shall have an administration reader. This shall be provided either as part of the CNC or a PC interface kit. Operators must use their proximity token to log onto the system and to accept alarms. The use of an operator password may also be required. The administration reader shall also be used to enrol new tokens into the system and to identify tokens that are already in the system database.

8.17 **Operator Privileges**

Operators of the PC administration system must be uniquely identifiable. There shall be several operators. Each operator shall have independent system privileges. The system shall record which operator is currently logged on. When system alarms require acceptance, regardless of which operator is currently logged on, the system shall ask for the operator's name and password. If authorised the operator should present their token to the administration reader to accept the alarm.

8.18 **Import and Export**

The system shall have a facility for importing or exporting the personnel database. The import and export shall be achieved via an ASCII text file with field separators.

8.19 **Card Trace**

The system shall have a facility to tag or track the use of a token. This facility shall be able to cause an alarm on PC. Access privileges of the token holder will remain the same and the token holder will be unaware that they are being traced.

8.20 **Extra information fields**

The personnel database shall have at least twenty extra information fields. The titles of these fields must be user definable. Each information field must be at least 120 characters in length. Each division shall have its own unique extra information fields.

8.21 **Departments and Work groups**

When adding new token holders it shall be possible to assign a Department and a Work Group to the token holder. Departments restrict the access groups that can be selected for each token holder record. Work Groups are a subset of Departments and further restrict the number for access groups that can be chosen. It shall also be possible to generate reports by Department and Work Group.

8.22 **ASCII transaction file**

The PC security administration system shall provide the facility of a data file that contains all personnel access transactions in ASCII data format. This is separate and additional to the system event log. The format of each record shall consist of personnel identification number, date (DD/MM/YY), door number, time (HH:MM), site number and transaction type.

8.23 **Start and End Dates**

It is required that all ID devices may have the option of a start and end of validity date.

8.24 **Alarm Monitoring and Graphics maps**

An alarm manager program shall allow the operator to see any alarms that occur easily and clearly. A text message shall be attached to each alarm and shall tell the operator what action should be taken for each individual alarm.

It must be possible to attach a graphic illustration in the form of a bitmap to specific alarms. There shall be the optional facility to record sounds, including spoken messages, which can be linked to specific alarm events.

The alarm manager program shall keep track of all alarm events, which operator acknowledged them and what action was taken.

8.25 **Transaction Reporting**

The system shall have the capability of extensive transaction searching and reporting. Reports must be able to be generated by, but not limited to the following:

Area
Doors
Department
Access group
Transaction type
Token holder

Start of period date and time
End of period date and time.

8.26 There shall be the facility to report on tokens that have not been used over a specified period of time.

8.27 There shall be the facility to produce a "Presence" report. This report shall provide information on which cardholders are currently on site.

9.0 OTHER FEATURES

9.1. Intelligent Anti-Passback

The Anti-passback feature requires that a badge always be used to enter and exit an area. The controlled areas should have both entry and exit card readers at all portals.
A cardholder must present his/her badge at the entry card reader of the area that the person wishes to enter. Once access has been granted into the area, the cardholder cannot present the badge to another entry card reader within the same area without first presenting his/her badge to the respective exit card reader of that area. Should a cardholder attempt to use any other card reader in the same area besides the occupied areaôs exit card reader once access has been granted to that area, the cardholder shall be denied access and an alarm shall be reported to the Alarm Monitoring client workstation.

9.2. Two-man Control

Two Person Rule should be provided to restrict access to certain areas unless there are two (2) cardholders present. This restricts individuals from being alone in restricted or highly secure areas. When an area is configured for Two Person Rule, the following criteria will prevail:

- The card reader shall grant access only if two (2) valid cardholders (with authorized access levels) swipe their badges one after the other. In the event that a second authorized card is not presented within 10 seconds of the first authorized badge, the card reader shall reset and the first card will have to be swiped again.
- Once two (2) people occupy an area, individual access shall be granted.
- Individual exit shall be permitted until an area is occupied by only 2 cardholders at which point the Two Person Rule applies for exit.

9.3. Advanced Area Control

a. Designated One Person
This mode shall require that a designated cardholder is present before anyone else is allowed to access a certain area. This restricts individuals from accessing a restricted or highly secure area when not accompanied by the designated cardholder. When an area is configured for One Person Mode, the following criteria shall prevail:

ǒ The card reader shall grant access only if the designated cardholder (with authorized access level) swipes their badge.
ǒ Once the designated cardholder occupies an area, individual access shall be granted normally.
ǒ Individual exit shall be permitted until an area is occupied by only the designated cardholder, once the specific cardholder leaves, the area will again require the specific cardholder to be present before any other individual is allowed to gain access.

b. Designated Two Persons
This mode restricts access to certain areas unless there are two (2) cardholders present and they are designated a special ñTeam Memberò distinction. This restricts individuals from being alone in restricted or highly secure areas as well as restricting the type of personnel allowed in a certain area.

c. Cardholder escort
When a cardholder is given an access level with Escorted Cardholder privileges, the cardholder shall require an Escort to gain access to areas in which they are to have escorted access. The access level shall only be valid in the system during its activation and deactivation interval.
ǒ With Cardholder Escort feature, an access level shall be set as:
ǒ Not an escort and does not require an escort
ǒ An escort
ǒ Requires an escort

A cardholder shall receive a specific type of access to an area depending on the access level they are assigned. For some areas, a cardholder may be an escort and in others they may be need to be escorted, depending on their access level.

d. Tailgate control

Tailgate control prevents piggybacking - two persons from using one card to gain access.
The tailgate system consists of two self-contained, narrow door mounted units. The tailgate system senses and processes direction and pedestrian count information when a valid card is used.
If two people are granted access, an alarm output is fires to the system. In a SMS system, an integration to CCTV can activate recording.

e. Occupancy Limit

Occupancy Limit restricts the number of cardholders that shall be present in an area at any given time. Once the occupancy limit has been reached, a cardholder must swipe out of the exit card reader before the next cardholder may enter.
Multiple Occupancy Limit Areas should be definable.

9.4. **Computer Anti-Passback Area Access**

Supports practical implementation and enforcement of a security policy which only allows access to computers in designated areas to personnel physically present in these areas.
An employee must present a badge to the card reader in order to enter and exit these secure areas.
Example:
A cardholder has access levels that allow him to enter secure area A. In addition, he has a network account of type B, which allows him access to computers in area A. When the cardholder gets ñaccess grantedò on entry reader of area A, his computer account of type B is enabled. When the cardholder leaves the area his network account becomes disabled.

9.5. **Door Held-Open**

The Door Held Open time is a user-definable time that allows a card readerôs door to be held open for an extended period of time beyond the predetermined standard held open time on a per cardholder basis.
System Administrators shall have the ability to determine which cardholders are granted the extended held open times.
For example when Cardholder A swipes his card, the card reader door shall be allowed to be held open for five (5) seconds, but when Cardholder B swipes his card, the door shall be allowed to be held open for sixty (60) seconds.
The system should also support extended and on-demand door held-open times activated via command key pads. This consists of a command key sequence that shall be from 3 to 6 keys used to enter the number of minutes to extend the door held open time (up to 999 minutes) and a pre-alarm time.

9.6**.** **Interlocking**

The SMS shall have Interlock support. In the Anti-passback area, there shall be an option to make an area an interlock area. Interlocked areas shall be able to be configured, allowing only one door to be opened at a time within the area.

The system should support interlocking group readers. As soon as one door's strike is energized or door is open in the group, all other doors will be denied access until a condition is met and there shall be an alarm for when access is denied due to interlock reader group. Exit shall also be denied and there shall be an alarm when pressing the REX button on the panel.

9.7 The system shall have an attendance report facility. This report shall be flexible and provide the total time a selected cardholder or cardholders have been on a site over a selected period.

9.8 **Elevator Control**

Elevator control will permit the restriction of cardholder access to certain floors while also allowing general access to other floors.
The elevator control feature shall allow, at the elevator, the use of any card reader and all card reader modes used on any other card reader in the system e.g. enforcement of Timezones defined in the system.
An elevator card reader would be located in the cab of the elevator. The card reader (and integration to system controllers) shall restrict which floor select buttons are accessible when a badge is swiped based on the cardholderôs access level.
A single card swipe shall permit only one authorized floor to be selected. A request for another restricted floor shall require a second card swipe. Those floors programmed as public access (that is, lobby) shall not require a swipe and shall be selected by any passenger.
The system should be able to track which floor was selected by an individual cardholder for auditing and reporting purposes.

9.10 **Photo ID**

The system shall have an optional facility that allows a token holderôs photograph to be captured, stored and displayed with each personnel record. Identification cards shall also be designed and printed from the same menu.

When a token has been presented to a specified reader the recorded image of the token holder shall appear on the screen. The system shall provide the operator with the ability to either allow or deny access if the token is not valid.

9.11 **Audit Trail**

A facility shall be available that enables specified operators to conduct searches of previous operator changes to the system. This facility shall allow searches between specified dates for changes made by specified operators or all operators. The system shall also be able to search for specified types or all types of change.

9.12 **Guard Tour**

A facility should be available to monitor security guards as they travel around a building.

9.13 **Alarm Graphic Interface (AGI)**

The facility should be available that enables alarm points to be deposited as icons onto a bit map of a building. Icons must change state as alarms are received onto the system.

9.14 **Alarm Prioritisation**

The facility should be available that enables alarms to be prioritised.

10 VISITOR MANAGEMENT SYSTEM (VISMS)

A visitor management system should be available as an integrated solution that is seamlessly integrated into the Security Management System.

a) Seamless Integration with Access Control, Alarm Monitoring, Asset Management

The Visitor Management System should seamlessly integrate with the Access Control and Alarm Monitoring System. Visitors shall have the ability to be assigned access levels and move throughout the facility using their credential.

The Visitor Management System should seamlessly integrate with the Asset Management System. Visitors shall have the ability to be assigned corporate assets. Assets shall be added to, and removed from, visitors and recorded in a detailed audit trail. Visitors generating asset alarms shall trigger those alarms to appear in the Main Alarm Monitoring window.

All visitors shall be assigned and linked to a cardholder record that will be hosting the visitor.

b) Visitor Database

A record for each visitor shall be created in the Visitor Management System by entering the required data into appropriate data fields. The System Administrator shall be able to define drop-downs for repetitive entered text (for example: Company Representing, Reason for Visit, etc.).

Drop-downs shall allow the System Operator a variety of predefined choices for data input. The screen design shall be configurable to allow the entry of data in any format desired

A data import function shall be available to pre-load the VISMS with visitor records and industry-standard image formats.

Once enrolled, a visitor shall not require re-entry of information. Upon a new visit, the visitor's information shall be able to be searched up from the database.

The system should support on-demand and pre-scheduled visitor enrollment.

The integrated Visitor Management System should be able to use standard data capture devices as the Access Control System.

System Operators shall have the option to also manually enter a Badge ID for the visitor when scheduling a visit. System Operators will also assign any temporary access levels for each visitor that is enrolled by assigning the visitor a badge type.

The Visitor Management System shall allow for fast and efficient re-assignment of Badge IDs for use for visitor badges. Re-assignment shall be such that the Badge ID shall be stored in an audit trail and reported with the visitor that was assigned to that Badge ID for the specified period of time.

The Visitor Management System shall allow the option to add a visit for a visitor at the time of the visitor's enrollment. Visitor information shall be able to be changed at any time.

Once a visit has been scheduled, the option to ñSign Inò shall be made available. When signing in, a dialog shall prompt the System Operator to optionally print a badge, assign an access control badge to a visitor, and notify the cardholder of the visitor via e-mail.

When the scheduled visitor has been signed in but not signed out, the option to ñSign Outò shall be made available. When signing out, the actual Time Out field shall be updated and all active badges for the visitor shall be deactivated.

The Visitor Management System shall support bulk sign-in capabilities to allow for batch sign in for all visitors associated with a single visit.

c) Visit Status Reporting

The VISMS should report on Visit status including:

- ŏ All visits currently in progress (signed-in)
- ŏ Visitors due in during the next user-defined minutes
- ŏ Visitors whose visit should have started, but who have not checked in

- ŏ Visits due to expire in the next user-defined minutes
- ŏ Overstayed visits
- ŏ Completed Visits

d) Visit Reports

The Visitor Management System should support generation of the following Visit reports: Active Visits by Visitor name, Cardholder, Host, Completed Visits, Visit History report.

e) Visitor Management System Application Types

i) Browser-based Visit Host Application

The system should provide a Browser-based visit host application that provides three distinct functions: registration of visitors, scheduling events, and visit calendar.

The browser-based visit host application shall allow for registration of visits by a Cardholder in the database, allow the cardholder to create a new visit, specifying event name, event date, event time, and event purpose. The cardholder shall be able to search for a visitor in the system to schedule the visitor for the visit.

The browser-based visit host application shall provide a visit calendar that shall keep track of all visits the cardholder has scheduled. The calendar shall also provide status of the visitor associated with the visit, specifically if the visitor is, scheduled, late, onsite, overstayed, or signed out.

The browser-based visit host application should support the designation and management of delegates. The delegate shall be able to schedule a visit on behalf of other hosts. The browser-based visit host application shall have an advanced search that shall be able to search for delegates, hosts, invited visitors, and user-defined fields.

ii) Front-desk Application

The system should provide a smart client based front desk application.

The administrator shall be able to capture visitor details from business cards using business card scanner, driverôs license scanning, ePassport etc. Visitors visitors shall be able to be searched using the last name scanned from a driverôs license, business card or ePassport.

The System Administrator should have the option of configuring and sending an e-mail to the visitor upon the successful scheduling of the visit. The e-mail shall contain a unique visit identification number that can be displayed as both a bar code and a numerical value. The visit identification number shall be valid for only one visit.

iii) Visitor Self Service

The system should provide a Visitor Self Service application that is an iPad tablet app that allows visitors to sign themselves in or out for events without assistance.

The Visitor self service application should provide the option of signing in visitors by allowing the visitor to provide a unique visit identification number that shall be generated by the SMS visitor management applications. Each visit identification number shall only be valid for a single visit.

The visitor application should provide the option for documents to be displayed and optionally signed. If configured, the documents shall be signed by the visitor using the digitizer of the iPad, with a finger or stylus.

The application should provide the ability to take a photograph of the visitor using the camera built into the iPad with an option for the visitor to retake the photograph.

The application should provide a preview of the visitor credential before printing. The visitor credential shall optimally contain a bar code of the visit identification number. The application shall be able to print the visitor credential from the iPad to a label printer using Apple Airprint protocol

The Visitor Self Service application should provide the ability for a visitor to sign themselves out of the SMS by selecting the sign out option and providing the visit identification number in either a numerical or bar code form. After selecting the sign out option, the SMS shall report the visitor as signed out of the SMS.

The application should utilize the iPadôs camera as a bar code scanner for the purpose of scanning in a visit identification number from a bar code emailed to the user (for Pre-registered users). This system should be able to print wearable, disposable, peel and stick visitor badges.

Check-in and checkout message text should be customizable.

f) Activity Logging

The system should log changes to the visitor management configurations including the enrollment of visitors, assignment of visitors to cardholders, scheduling visits, and other critical functions.

The system should permit the System Administrator to define the number of daysô worth of activity to keep online (data retention period) before the System Administrator purges the oldest data offline.

11 X-RAY LUGGAGE SCANNER

GENERAL	X-Ray luggage scanner capable of detecting organic and inorganic items such as weapons, explosives and narcotics in 6colors. Variable auto-detection sensitivity Easy relocation of device when needed. Steel penetration of at least 37mm. At least 50cm by 30cm tunnel dimensions.
Technical Specifications	Real time health status monitoring; Real time self-diagnostics 6 Color Imaging in Atomic Z-Numbers range. Auto archive of images, at least 25,000 images supported; With manual archive option. Baggage counter Continuous Zoom 2X to 32X Edge-Enhancement imaging; Real-time image manipulation 38 AWG ; Contrast Sensitivity 24 visible levels, 4096 grey levels; Diagonally upward beam direction; 220 VAC, 50Hz frequency 24ò LCD Color monitor; Capable to network two operators (operator plus supervisor 100% duty cycle; at least 25mm steel penetration; Compliant with radiation safety requirements (attach certificate); Tunnel opening size at least 600(W) mm x 400 (H) mm +/-10%; Scanner weight at least 30kg. Crated weight at least 450kg. Sealed drum motor. Conveyor speed at least 0.3m/s in both directions Radiation Leakage less than 0.1mR/hr. Comply with US FDA 21-CFR 1020.40, 14 CFR 108.17, 14 CFR 129.26

12 WALK-THROUGH METAL DETECTORS

i. The Walk Through Metal Detector shall be able to detect with equal precision both ferromagnetic and non-ferromagnetic metallic items. With high discrimination between weapons which are to be detected, and personal metal effects.

ii. The Walk Through Metal Detector must be a multi-zone with no less than 9 independent zones with freely adjustable sensitivity for each zone separately.

iii. The sensitivity level of the Walk Through Metal Detector shall be constant throughout the entire interior of the frame with maximum deviation of electromagnetic parameters not exceeding 5% from the set values.

iv. The Walk Through Metal Detector has support Real-time continuous self-diagnostics, Alarm monitoring and Alarm audit reporting.

v. The Walk Through Metal Detector shall allow for adjustment of sensitivity and resolution depending on the threat level so that the modes of work can be set with a low and high sensitivity and resolution in order to detect small and large metal objects.

- The means for adjusting the detection settings of the Walk Through Metal Detector shall be protected and accessible only to authorized persons.
- Random alarm capability programmable from 0% to 100%

vi. Quick reset time as short as 0.5 seconds for high throughput rate

vii. The detection of the Walk Through Metal Detector shall be independent of the position and orientation of the metallic item. The display must indicate, by means of illuminated LEDôs, the position of the weapon on the person.

viii. The Walk Through Metal Detector shall have clear visual indictors to show equipment is in operation, acceptance or rejection, or interruption of electricity supply or strong voltage fluctuations.

ix. Calibration of the Walk Through Metal Detector shall be performed by the following means:-

i. Manually
ii. Through a remote control unit
iii. By automated self-calibration

x. **DEVICE SUPPORT FOR:**

Hardware access password; Tamper/Vandal protection; Web server integration, data logger and real-time clock capability. Backup battery; and capable of being powered by safe low voltage DC. RS-232, Ethernet, USB interface support;

xi. **Detection Speed:** At least 40ft/sec detection speed independent of transit speed.

Measurements: At least 2m (L) * 0.7m (W);

Multiple selectable sound intensities ranging from 0 to 90 dbA at 1m

Dual Side 20 localization zones

Anti-vandalism, anti-tampering protection; Weather resistant protection (IP65).

PROGRAMMING

A. Local by Control Unit alphanumeric display and keyboard
B. Programming access protected by user and super-user passwords
C. Support for control unit for full remote access, including alarm signaling and programming of the Walk Through Metal Detector.

13 HAND HELD METAL DETECTOR

i. **Ultimate sensitivity:** detects medium sized pistol from 9" distance; large knife from 6"; razor blades and box cutters from 3" distance; foil-wrapped drugs and tiny jewelry from 1".

ii. **Self-calibrating:** digital microprocessor technology eliminates the need for periodic sensitivity adjustments.

iii. **Rugged, high-impact ABS case** with reinforced coil compartment. Exceeds Mil-Std-810F (drop test) Method 516.5, procedures II and IV.

iv. **Large 8" scan surface** for quick, thorough scanning.

v. **No tools required** to change standard 9V battery (included). Optional rechargeable battery kit available.

vi. **Sharp audible alarm and bright red LED** indicates the detection of metal.

vii. **Momentary push button** helps temporarily eliminate detection of nearby ambient metal such as rebar, metal walls.

viii. **Three-color LED indication:** Green LED indicates ON; Amber LED indicates LOW BATTERY: Red LED indicates ALARM.

ix. **Operating temperatures:** -35° F (-37° C) to 158° F (70° C)

14 3 –ARM FULLY GLAZED GLASS FULL HEIGHT TURNSTILE

Specifications:-

i. For interior/exterior installation
ii. Curved
iii. Rotation locking mechanism
iv. Anti-trap system
v. Fully glazed glass finish with brushed stainless steel frame/stands
vi. Perpetual base bearing
vii. 100% corrosion free
viii. Purpose built reader housing
ix. Wings: 3No.
x. Diameter of rotation 1200 mm
xi. Arm spacing: 120mm
xii. Suspended rotor technology with shock absorbing systems
xiii. Self centering rotation system
xiv. Auto-lock on alarm option
xv. Integrates with all access controlled systems
xvi. Power requirements: 240vac 50Hz
xvii. Flat Roof Canopy for anti-climb complete with low energy light on the underside of canopy
xviii. Mechanical Key override
xix. Ultra quiet buffered solenoid and pawls

15.0 WARRANTIES

15.1 The access control equipment, including door controllers, readers, central network controllers shall be warranted by the manufacturer against electronic failure for at least five years. The access control tokens shall carry a lifetime warranted against electronic failure. ("Lifetime" means that if the token electronics should fail at any time it will always be replaced).

15.2 It is accepted that the security system will require preventative maintenance.

16.0 COMMISSIONING AND TRAINING

16.1 The system shall be programmed with the information supplied. The system must be fully working with all system parameters and token holder's information. It is the tenderer's responsibility to ensure that all the necessary information is obtained before commissioning the system.

16.2 At least two and up to four members of staff will be nominated as operators of the system. These operators must receive sufficient training on the operation and configuration of the system to enable these operators to train others. The training shall be conducted by the manufacturer's own training staff or by other certified training staff.

16.3 A copy of the final database of the PC administration system, held on CDôs, shall be included at the final hand over of the system.

16.4 The tenderer shall supply detailed "as installed" drawings of the entire system.

PART F:

BILLS OF QUANTITIES AND SCHEDULE OF UNIT RATES

PART F: BILLS OF QUANTITIES AND SCHEDULE OF UNIT RATES

CONTENTS:

BILLS OF QUANTITIES AND SCHEDULE OF UNIT RATES

1. General Note to Tenderers

1.1 The total of the prices in the summary of prices shall include for the whole of the Sub Contract works in accordance with the specifications as defined before and shall be carried forward to Form of Tender.

1.2 Any prices omitted from any item, section or part of the price schedule shall be deemed to have included in another item, section or part.

1.3 The prices shall include for all obligations under the Contract including and not limited to:

a) Supply of any materials, equipment, apparatus, fittings, spares and tools

b) Insurance

c) Clearing and forwarding

d) Delivery, handling and storage at site

e) Packing for storage

f) Replacing any defective or damaged item

g) Installation

h) Testing

i) Painting

j) Commissioning

k) Maintenance during the defects liability period

1.4 The unit rates shall include import duty and VAT where applicable, and shall be expressed in Kenya Shillings.

1.5 Any tenderer whose firm uses the title ñEngineerò or ñEngineeringò must provide evidence of registration of at least one of the directors by the Engineers Registration Board of Kenya to avoid disqualification.

1.6 Any tenderer who fails to price the General items will be deemed to have allowed 5% of his tender price to cover these items, i.e. 5% of the total tender price will be deducted as preliminaries, if the tenderer does not enter specific prices against items of preliminary.

1.7 The contractor is instructed to read all the pages, and all the items of the Bills of Quantities very carefully. Should there be an apparent omission of words or figures, or should the contractor be in doubt about the precise meaning of any word or figures, or for any reason whatsoever feel more clarification is necessary, either in the drawings or Bills of Quantities, to facilitate reasonable pricing of the tender document, he should inform the engineer at once so that the correct interpretation or clarification may be given before tendering. No liability will be accepted on mistakes and/or omissions which should have been corrected in the format above.

1.8 The specification should be priced in Kenya Currency i.e Shillings and cents.

1.9 The following meanings/interpretations shall be attached:-

Labelling:	"Comprehensive, concise and instructive permanent labelling of all the sub-circuits, complete with identification of the sizes of all the sub-circuit cables, permanent traffolyte identification of the board such as "DB. A" and identification of the sizes of the sub-mains and their origin e.g "Board A: Supply: $4x16mm^2$ SOURCE: DB.1"

1.10 The contract is for supplying, delivering, fixing/installing, testing, commissioning and setting to work to the full satisfaction of the Engineer and the contractor's price must include all cost for the entire process.

1.11 The contractor shall ensure that the highest standards of workmanship and highest quality materials are used at all times. Inferior workmanship and low quality materials shall be rejected and replaced at the Sub-contractors own cost.

1.12 The contractors shall be solely responsible for the correct and accurate ordering of materials in accordance with the drawings and Bills of Quantities.

1.13 This is a fixed price sub-contract, and the sub-contractor is expected to allow (in his unit rates) for generous fore-casts on fluctuations.

1.14 The Bills of Quantities shall be read in conjunction with Notes to All Tenderers, Preliminaries, General Specifications, Particular Specifications and all the relevant drawings.

1.15 A rate or price shall be entered against each item in the priced Bills of Quantities whether quantities are stated or not. The cost of items against which the sub-contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bills of Quantities.

1.16 The whole cost of complying with provisions of the contract shall be included in the items provided in the Bills of Quantities, and where no items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related items of work.

1.17 General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bills of Quantities. Reference to the relevant sections of the contract document shall be made before entering prices against each item in the priced Bills of Quantities.

1.18 Provisional sums and contingencies included and so designated in the Bills of Quantities shall be expended in whole or in part at the direction and discretion of the Client.

1.19 Errors in pricing will be corrected by the Employer for any arithmetic errors in computation or summarization as follows:-

a) Where there is a descrepancy between amounts in figures and amounts in words, the amount in words will govern.
b) Where there is discrepancy between the unit rate and the total amount derived from the multiplication of the unit price and the quantity, the unit rate quoted will govern unless in the opinion of the employer, there is an obviously gross misplacement of the decimal point in the unit prices, in which event the total amount as quoted will govern and the unit rate will be corrected.

Statement of Compliance

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

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

Signed: é é é é é é é é é é é é é *.for and on behalf of the Tenderer*

Date: é é é é é é é é ..

Official Rubber Stamp: é

COMMUNICATIONS AUTHORITY OF KENYA
PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES
BILL No. 1: ACCESS CONTROL INSTALLATIONS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh. Cts.)
	Supply, install, test and commission Access Control System				
1.01	**Server and Licenses** Dell OptiPlex 3020 Small Form Factor CTO - Intel Core i3 - 4160 (Dual core 3.6GHz 3MB w/HDD 4400graphics); 4GB (1 x 4GB) non - ECCD D31600MHz SDRAM memory; 500GB 3.5inch SATA (7200rpm) HDD; small form factor chassis mainstream heatsink (65W); 8 x slimline DVD+/-RW drive; European powercord; AMD RDNHD R5240, 1GB, HH; Internal Dell business audio speakers; Dell USB optical mouse; Quiet Key USB Keyboard; Windows 7 Professionoal 64bit + Windows 7 Professional resource DVD, 2 No. 42" LCD Industrial Screen, 7.5kVA UPS 3 Yr Basic Warranty. **(Access Control records to be retained in the system for NOT LESS THAN 5 years)**	1	No.		
1.02	Access Control Server Software License. Includes licenses for System Administration & Configuration; License Services; Importation of Data; Panel Communication Services; Event Monitoring; Maps; support for at least 256 card access readers; and first year support plan	1	No.		
1.03	Client Software License - includes Client software licenses for System Administration & Configuration, Event Monitoring, Map, ID Badge module (enrollment, capture and printing), Cardholder Image Export, Enhanced Imaging Option for card security and Badges design tool. (Minimum hardware requirements)	1	No.		
1.04	**Controller and Enrollment Readers** Main Controller - 12 VDC or 24 VDC @ 700mA, 5 year lithium battery, memory for at least 50,000 of Events, supports a minimum of 32 devices, TCP/IP, 8 inputs, 4 form C relays Output Relays, cabinet tamper and power fault input monitors. RoHS, CE marked and UL 294	4	No		
1.05	HID iClass SE Encoder, Card programmer, encoder	2	No		
1.06	BioScrypt / V-Station 4G Lite / Secugen Optical /iClass - Mifare - DESFire (S, O) fingeprint Enrollment	1	No		
1.07	V-Station 4G Desktop stand	1	No		
	Total C/F to Page F6				

COMMUNICATIONS AUTHORITY OF KENYA
PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES

BILL No. 1: ACCESS CONTROL INSTALLATIONS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh. Cts.)
	Total B/F from Page F/5				
1.08	Enclosure with 4.0A Power Supply with to convert 115/230VA C50 / 60Hz input, into a 12VDC or 24VDC output, with 4amps of continuous supply current, UPS capable with enclosure and lock (Include battery)	3	No.		
1.09	Dual door Controller that Supports Wiedand and OSDP Readers 12/24 VDC, 8 inputs, 6 (5A) form C relays , RoHS, CE and UL294 certified	30	No		
1.10	Single door Controller that Supports Wiegand and OSDP Readers 12/24VDC, 2 inputs and 2 outputs relays (2A and 5A) and cabinet tamper, RoHS, CE, C-Tick and UL294 certified	4	No		
1.11	BioScrypt / V-Station 4G Lite / Secugen Optical /iClass - Mifare - DESFire	4	No		
1.12	HID iCLASS SE RK40, Wall Switch, Kp, Wiegand Interface, Terminal Strip , Black(32-bit 14443A CSN, standard iCLASS + SIO (EV1, MIFARE, iCLASS, SEOS), LED RED, FLSH GRN, BZR ON, 09 (8-bit) keypad)	30	No		
1.13	HID iCLASS SE multiCLASS RP10,Mini-Mullion, Wiegand Interface, Terminal Strip, Black (HID/AWID/EM4102 Prox, 32-bit 14443A CSN, standard iCLASS + SIO (EV1, MIFARE, iCLASS, SEOS), LED RED, FLSH GRN, BZR ON)	26	No		
1.14	Magnetic Lock, 280KG Holding force, with hall sensor. Brush Metal finish with LED indicator	34	No		
1.15	Resettable Emergency Door Release (Green) + Plain Hinged cover	34	No		
1.16	Over Ride Key Switch	34	No		
1.17	Enclosure with 4.0A Power Supply with to convert 115/230VA C50 / 60Hz input, into a 12VDC or 24VDC output, with 4amps of continuous supply current, UPS capable with enclosure and lock (Include battery)	34	No		
1.18	Full height, three wing, curved, single glass turnstile as per specifications (Part E)	2	No		
	Total C/F to Page F7				

COMMUNICATIONS AUTHORITY OF KENYA
PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES
BILL No. 1: ACCESS CONTROL INSTALLATIONS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh. Cts.)
	Total B/F from Page F/6				
1.19	Dual door Controller that Supports OSDP Readers 12/24 VDC, 2 Reader interface, W/M, 8 inputs, 6 (5A) form C relays , RoHS, CE and UL294 certified	2	No		
1.20	HID iCLASS SE RK40, Wall Switch, Kp, Wiegand Interface, Terminal Strip , Black(32-bit 14443A CSN, standard iCLASS + SIO (EV1, MIFARE, iCLASS, SEOS), LED RED, FLSH GRN, BZR ON, 09 (8-bit) keypad)	2	No		
1.21	HID iCLASS SE multiCLASS RP10,Mini-Mullion, Wiegand Interface, Terminal Strip, Black (HID/AWID/EM4102 Prox, 32-bit 14443A CSN, standard iCLASS + SIO (EV1, MIFARE, iCLASS, SEOS), LED RED, FLSH GRN, BZR ON)	2	No		
1.22	Magnetic Lock, 280KG Holding force, with hall sensor. Brush Metal finish with LED indicator	2	No		
1.23	Resettable Emergency Door Release (Green) + Plain Hinged cover	2	No		
1.24	Over Ride Key Switch	2	No		
1.25	Enclosure with 4.0A Power Supply with to convert 115/230VA C50 / 60Hz input, into a 12VDC or 24VDC output, with 4amps of continuous supply current, UPS capable with enclosure and lock (Include battery)	2	No		
1.26	Supply & Fix Fire Rated/Security Door Size 900 x 2100 TURIA 60min rating complete with Iron Mongery as supplied by Assa Abloy or approved equivalent	4	No		
1.27	KC-MC24 Video Phone Camera for KCV -A374 or approved equivalent	1	No		
1.28	Color Hands Free Video Phone Monitor 7 Inch Digital LCD (NTSC/PAL) LCD OSD Menu Room to Door Communication and Monitoring 5 Melody Selection Ultra Low Power Consumption Communication between Main Monitor and Sub Units Surface Mount Installation Door Opener Connectable from either Monitor or Camera Connection upto 2 Door Cameras and 2 Monitors with Sub-Audio Unit (KDP-602G) or approved equivalent	1	No		
	Total C/F to Page F8				

COMMUNICATIONS AUTHORITY OF KENYA
PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES
BILL No. 1: ACCESS CONTROL INSTALLATIONS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh. Cts.)
	Total B/F from Page F/7				
	1st Floor				
1.29	Dual door Controller that Supports Wiedand and OSDP Readers 12/24 VDC, 8 inputs, 6 (5A) form C relays , RoHS, CE and UL294 certified	25	No		
1.30	Single door Controller that Supports Wiegand and OSDP Readers 12/24VDC, 2 inputs and 2 outputs relays (2A and 5A) and cabinet tamper, RoHS, CE, C-Tick and UL294 certified	6	No		
1.31	BioScrypt / V-Station 4G Lite / Secugen Optical /iClass - Mifare - DESFire (S, O)	6	No		
1.32	HID iCLASS SE RK40, Wall Switch, Kp, Wiegand Interface, Terminal Strip , Black(32-bit 14443A CSN, standard iCLASS + SIO (EV1, MIFARE, iCLASS, SEOS), LED RED, FLSH GRN, BZR ON, 09 (8-bit) keypad)	25	No		
1.33	HID iCLASS SE multiCLASS RP10,Mini-Mullion, Wiegand Interface, Terminal Strip, Black (HID/AWID/EM4102 Prox, 32-bit 14443A CSN, standard iCLASS + SIO (EV1, MIFARE, iCLASS, SEOS), LED RED, FLSH GRN, BZR ON)	19	No		
1.34	Magnetic Lock, 280KG Holding force, with hall sensor. Brush Metal finish with LED indicator	31	No		
1.35	Resettable Emergency Door Release (Green) + Plain Hinged cover	31	No		
1.36	Over Ride Key Switch	31	No		
1.37	Enclosure with 4.0A Power Supply with to convert 115/230VA C50 / 60Hz input, into a 12VDC or 24VDC output, with 4amps of continuous supply current, UPS capable with enclosure and lock (Include battery)	31	No		
1.38	Supply & Fix Fire Rated/Security Door Size 900 x 2100 TURIA 60min rating complete with Iron Mongery as supplied by Assa Abloy or approved equivalent	8	No		
	Total C/F to Page F9				

COMMUNICATIONS AUTHORITY OF KENYA
PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES

BILL No. 1: ACCESS CONTROL INSTALLATIONS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh. Cts.)
	Total B/F from Page F/8				
	2nd Floor				
1.39	Dual door Controller that Supports Wiegand and OSDP Readers 12/24 VDC, 8 inputs, 6 (5A) form C relays , RoHS, CE and UL294 certified	22	No		
1.40	Single door Controller that Supports Wiegand and OSDP Readers 12/24VDC, 2 inputs and 2 outputs relays (2A and 5A) and cabinet tamper, RoHS, CE, C-Tick and UL294 certified	4	No		
1.41	BioScrypt / V-Station 4G Lite / Secugen Optical /iClass - Mifare - DESFire (S, O)	4	No		
1.42	HID iCLASS SE RK40, Wall Switch, Kp, Wiegand Interface, Terminal Strip , Black(32-bit 14443A CSN, standard iCLASS + SIO (EV1, MIFARE, iCLASS, SEOS), LED RED, FLSH GRN, BZR ON, 09 (8-bit) keypad)	22	No		
1.43	HID iCLASS SE multiCLASS RP10,Mini-Mullion, Wiegand Interface, Terminal Strip, Black (HID/AWID/EM4102 Prox, 32-bit 14443A CSN, standard iCLASS + SIO (EV1, MIFARE, iCLASS, SEOS), LED RED, FLSH GRN, BZR ON)	18	No		
1.44	Magnetic Lock, 280KG Holding force, with hall sensor. Brush Metal finish with LED indicator	26	No		
1.45	Resettable Emergency Door Release (Green) + Plain Hinged cover	26	No		
1.46	Over Ride Key Switch	26	No		
1.47	Enclosure with 4.0A Power Supply with to convert 115/230VA C50 / 60Hz input, into a 12VDC or 24VDC output, with 4amps of continuous supply current, UPS capable with enclosure and lock (Include battery)	26	No		
1.48	Supply & Fix Fire Rated/Security Door Size 900 x 2100 TURIA 60min rating complete with Iron Mongery as supplied by Assa Abloy or approved equivalent	7	No		
	Total C/F to Page F10				

COMMUNICATIONS AUTHORITY OF KENYA
PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES

BILL No. 1: ACCESS CONTROL INSTALLATIONS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh. Cts.)
	Total B/F from Page F/9				
1.49	KC-MC24 Video Phone Camera for KCV -A374 or approved equivalent	2	No.		
1.50	Color Hands Free Video Phone Monitor 7 Inch Digital LCD (NTSC/PAL) LCD OSD Menu Room to Door Communication and Monitoring 5 Melody Selection Ultra Low Power Consumption Communication between Main Monitor and Sub Units Surface Mount Installation Door Opener Connectable from either Monitor or Camera Connection upto 2 Door Cameras and 2 Monitors with Sub-Audio Unit (KDP-602G) or approved equivalent	2	No.		
	<u>3rd Floor</u>				
1.51	Dual door Controller that Supports Wiedand and OSDP Readers 12/24 VDC, 8 inputs, 6 (5A) form C relays , RoHS, CE and UL294 certified	17	No.		
1.52	Single door Controller that Supports Wiegand and OSDP Readers 12/24VDC, 2 inputs and 2 outputs relays (2A and 5A) and cabinet tamper, RoHS, CE, C-Tick and UL294 certified	Nil	No.		
1.53	HID iCLASS SE RK40, Wall Switch, Kp, Wiegand Interface, Terminal Strip , Black(32-bit 14443A CSN, standard iCLASS + SIO (EV1, MIFARE, iCLASS, SEOS), LED RED, FLSH GRN, BZR ON, 09 (8-bit) keypad)	17	No.		
1.54	HID iCLASS SE multiCLASS RP10,Mini-Mullion, Wiegand Interface, Terminal Strip, Black (HID/AWID/EM4102 Prox, 32-bit 14443A CSN, standard iCLASS + SIO (EV1, MIFARE, iCLASS, SEOS), LED RED, FLSH GRN, BZR ON)	17	No.		
1.55	Magnetic Lock, 280KG Holding force, with hall sensor. Brush Metal finish with LED indicator	17	No.		
1.56	Resettable Emergency Door Release (Green) + Plain Hinged cover	17	No.		
	Total C/F to Page F11				

COMMUNICATIONS AUTHORITY OF KENYA
PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES

BILL No. 1: ACCESS CONTROL INSTALLATIONS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh. Cts.)
	Total B/F from Page F/10				
1.57	Over Ride Key Switch	17	No		
1.58	Enclosure with 4.0A Power Supply with to convert 115/230VA C50 / 60Hz input, into a 12VDC or 24VDC output, with 4amps of continuous supply current, UPS capable with enclosure and lock (Include battery)	17	No		
1.59	Supply & Fix Fire Rated/Security Door Size 900 x 2100 TURIA 60min rating complete with Iron Mongery as supplied by Assa Abloy or approved equivalent	4	No		
1.60	KC-MC24 Video Phone Camera for KCV -A374 or approved equivalent	1	No		
1.61	Color Hands Free Video Phone Monitor 7 Inch Digital LCD (NTSC/PAL) LCD OSD Menu Room to Door Communication and Monitoring 5 Melody Selection Ultra Low Power Consumption Communication between Main Monitor and Sub Units Surface Mount Installation Door Opener Connectable from either Monitor or Camera Connection upto 2 Door Cameras and 2 Monitors with Sub-Audio Unit (KDP-602G) or approved equivalent	1	No		
	<u>Visitor Entrance</u>				
1.62	Visitor Management system for the front desk as per Technical Specifications (Part E). Includes one (5) Front Desk Admin Client user license. Price to include unlimited number of visitor hosts and visits.	1	No		
1.63	X-Ray Hand Baggage Scanner 58cm x 78cm as per specifications (Part E)	1	No		
1.64	18 Zone Walk Through Metal Detector as per specifications (Part E)	1	No		
1.65	Hand Held Metal Detector as per specifications (Part E)	2	No		
	Total C/F to Page F12				

COMMUNICATIONS AUTHORITY OF KENYA
PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES

BILL No. 1: ACCESS CONTROL INSTALLATIONS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh. Cts.)
	Total B/F from Page F/11				
	Lift				
1.66	Single door Controller that Supports Wiegand and OSDP Readers 12/24VDC, 2 inputs and 2 outputs relays (2A and 5A) and cabinet tamper, RoHS, CE, C-Tick and UL294 certified	4	No		
1.67	Input Control Module (Series two) ?12/24 VDC, 16 zone input monitor module, (32) 1K resistors (with 2 programmable output relays) , RoHS CE, C-Tick and UL294 certified	11	No		
1.68	Output Control Module (Series two) ? 12/24 VDC, 16 relay output control module , RoHS, CE and UL294 certified	11	No		
	Badge printer		No		
1.69	DTC1250e - Base Model + Ethernet/USB with Internal Print Server, embedded Encoder, iCLASS SE	1	No		
1.70	HDP5000 YMCK: Full-color ribbon with resin black panel ï 500 images	1	No		
	Access Cards		No		
1.71	iCLASS Contactless Smart Card, 2K bits with 2 application areas 13.56 MHz, direct printable, ISO standard application areas 13.56 MHz, direct printable, ISO standard dimensions, non-programmed, no external card numbering. Include printing	600	No		
	Total C/F to Page F13				

COMMUNICATIONS AUTHORITY OF KENYA
PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES

BILL No. 1: ACCESS CONTROL INSTALLATIONS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh. Cts.)
	Total B/F from Page F/12				
	<u>Mombasa Regional Offices</u>				
1.72	Dual door Controller that Supports Wiedand and OSDP Readers 12/24 VDC, 8 inputs, 6 (5A) form C relays , RoHS, CE and UL294 certified	3	No.		
1.73	Single door Controller that Supports Wiegand and OSDP Readers 12/24VDC, 2 inputs and 2 outputs relays (2A and 5A) and cabinet tamper, RoHS, CE, C-Tick and UL294 certified	1	No.		
1.74	BioScrypt / V-Station 4G Lite / Secugen Optical /iClass - Mifare - DESFire (S, O)	1	No.		
1.75	HID iCLASS SE RK40, Wall Switch, Kp, Wiegand Interface, Terminal Strip , Black(32-bit 14443A CSN, standard iCLASS + SIO (EV1, MIFARE, iCLASS, SEOS), LED RED, FLSH GRN, BZR ON, 09 (8-bit) keypad)	4	No.		
1.76	HID iCLASS SE multiCLASS RP10,Mini-Mullion, Wiegand Interface, Terminal Strip, Black (HID/AWID/EM4102 Prox, 32-bit 14443A CSN, standard iCLASS + SIO (EV1, MIFARE, iCLASS, SEOS), LED RED, FLSH GRN, BZR ON)	4	No.		
1.77	Magnetic Lock, 280KG Holding force, with hall sensor. Brush Metal finish with LED indicator	4	No.		
1.78	Resettable Emergency Door Release (Green) + Plain Hinged cover	4	No.		
1.79	Over Ride Key Switch	4	No.		
1.80	Enclosure with 4.0A Power Supply with to convert 115/230VA C50 / 60Hz input, into a 12VDC or 24VDC output, with 4amps of continuous supply current, UPS capable with enclosure and lock (Include battery)	4	No.		
1.81	Supply & Fix Fire Rated/Security Door Size 900 x 2100 TURIA 60min rating complete with Iron Mongery as supplied by Assa Abloy or approved equivalent	1	No		
	Total C/F to Page F14				

COMMUNICATIONS AUTHORITY OF KENYA
PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES

BILL No. 1: ACCESS CONTROL INSTALLATIONS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh. Cts.)
	Total B/F from Page F/12				
	<u>Eldoret Regional Offices</u>				
1.82	Dual door Controller that Supports Wiedand and OSDP Readers 12/24 VDC, 8 inputs, 6 (5A) form C relays , RoHS, CE and UL294 certified	3	No.		
1.83	Single door Controller that Supports Wiegand and OSDP Readers 12/24VDC, 2 inputs and 2 outputs relays (2A and 5A) and cabinet tamper, RoHS, CE, C-Tick and UL294 certified	1	No.		
1.84	BioScrypt / V-Station 4G Lite / Secugen Optical /iClass - Mifare - DESFire (S, O)	1	No.		
1.85	HID iCLASS SE RK40, Wall Switch, Kp, Wiegand Interface, Terminal Strip , Black(32-bit 14443A CSN, standard iCLASS + SIO (EV1, MIFARE, iCLASS, SEOS), LED RED, FLSH GRN, BZR ON, 09 (8-bit) keypad)	4	No.		
1.86	HID iCLASS SE multiCLASS RP10,Mini-Mullion, Wiegand Interface, Terminal Strip, Black (HID/AWID/EM4102 Prox, 32-bit 14443A CSN, standard iCLASS + SIO (EV1, MIFARE, iCLASS, SEOS), LED RED, FLSH GRN, BZR ON)	4	No.		
1.87	Magnetic Lock, 280KG Holding force, with hall sensor. Brush Metal finish with LED indicator	4	No.		
1.88	Resettable Emergency Door Release (Green) + Plain Hinged cover	4	No.		
1.89	Over Ride Key Switch	4	No.		
1.90	Enclosure with 4.0A Power Supply with to convert 115/230VA C50 / 60Hz input, into a 12VDC or 24VDC output, with 4amps of continuous supply current, UPS capable with enclosure and lock (Include battery)	4	No.		
1.91	Supply & Fix Fire Rated/Security Door Size 900 x 2100 TURIA 60min rating complete with Iron Mongery as supplied by Assa Abloy or approved equivalent	1	No		
	Total for Access Control Installations C/F to Summary Page				

COMMUNICATIONS AUTHORITY OF KENYA
PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES
BILL No. 2: STRUCTURED LAN CABLING PLATFORM

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh. Cts.)
	Supply, install, test, commission and set to work (To the full satisfaction of all parties to the contract) the following: -				
2.01a)	24-port Cisco switch as catalyst WS-C 3750-24PS-S superstack 10/100 mbps stackable PoE, Fast Ethernet 124W 2 x 1G copper or 2 x 1G SFP	6	No.		
2.01b)	GBIC transceiver modules (LC to LC) multimode CISCO make for the switches above	6	No.		
2.01c)	A router with forwarding performance (64 Byte) 350Kpps 450Kpps 1Mbps 2 Mpps (With U40) WAN speed with services 200Mbps 200Mbps 400 Mbps Firewall performance (large packets) 900Mbps 900Mbps 1.9Gbps, Device switching capacity - 10Gbps 32Gbps 80Gbps Slot switching bandwidthFixed WAN ports 2xGE (1xcombo port) 3 x GE (2x combo ports0 8 x 10/100 Fast Ethernet, 8 PoE, 124W, 2 x 1G SFP or Equivalent to cisco 2960C-8PC-L	3	No.		
2.02	Dual Data cable outlets, type RJ45, complete with faceplates as Siemons or approved equivalent.	140	No.		
2.03a)	24 Port patch panel, type RJ45 Cat. 6A as Siemons or approved equivalent	12	No.		
2.03b)	Fiber optic patch panel, as Siemons or approved equivalent.	12	No.		
2.04a)	Purpose-made Free Standing cabinet (Type 42 U or equivalent) for the hub/patch-panel complete with extractor fan and 4 No. 3 pin power points on UPS. The cabinet to have front access glass door, all as per approved drawings	1	No.		
2.04b)	As above but 32 U	2	No		
2.05	10 kVA True online UPS complete with cabling and all the necessary accessories including Breakers	1	No		
2.06	FTP level 6A structured cables as Siemons or approved equivalent as Back-bone cabling for the switches, in redundant wiring.	300	m		
2.07a)	6 core multi-mode fibre for Back borne cabling for the switches above and other existing switches, in redundant wiring	300	m		
	Total C/F to Page F16				

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PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES

BILL No. 2: STRUCTURED LAN CABLING PLATFORM

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh. Cts.)
	Total B/F from Page F/15				
2.07b)	Multi-media converters DMC 530 SC	6	No.		
2.07c)	Fibre outlet dual MX-F-SC-01	6	No.		
2.07d)	LC-SC Multimode patch cords	6	No.		
2.07e)	LC-SC Multimode connectors	12	No.		
2.07f)	Splicing, termination, testing and commissioning of the above Fibre connections		Item		
2.08	UTP Cat 6A structured cables as Siemons or approved equivalent	83	Boxes		
2.09	UTP Cat. 6A patch cord, 3M as Siemons or approved equivalent	140	No.		
2.10	UTP Cat. 6A patch cord, 1M as Siemons or approved equivalent	440	No.		
2.11	Data cable termination, both ends.	440	No.		
2.12	RJ45 Patch Cord as Siemens or approved equivalent	140	No.		
2.13	Cable organizers.	6	No.		
2.14	Allow for testing and commissioning of the installations.		Item		
2.15	Allow for fixing permanent labels on all the equipment and cables.		Item		
2.16	Power outlet for the 24-port switches, comprising 2 No. twin sockets, wiring in 2.5mm² ring-main wiring, conduit, box and all accessories.	6	No.		
2.17	Allow for structured cable termination at all computer terminals, attendance in power connection, testing and commissioning of the network to TSD-ISN Standards.		Item		
2.18	75 mm x 50 mm metalic cable tray complete with all accessorie including cable ties inside the ceing	900	m		
2.19	75 mm x 50 mm metalic mini trunking complete with all accessories	800	m		
	Total for Structured LAN Cabling C/F to Summary Page				

COMMUNICATIONS AUTHORITY OF KENYA
PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES
BILL No. 3: GENERAL ITEMS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh. Cts.)
	Supply, install, test, commission and set to work (To the full satisfaction of all parties to the contract) the following: -				
3.00	Carry out comprehensive Security Management System Installations testing and analysing, after installations. The testing and commissioning will be done as detailed below. 1) Prior to commencement of the work the Service Provider shall submit a procedure for the inspection, testing and commissioning of the intruder detection system. This procedure shall include for the visual and functional check/test of all components of the system - the visual check will cover the standard of workmanship, the functional quality of the equipment and general compliance with the system specification and the functional tests shall check the operation of the system as a whole. 2) Commissioning will be undertaken by a qualified person using the approved inspection, testing and commissioning procedure. 3) On successful commissioning of the system, in terms of the specified requirements, a Taking Over Certificate shall be completed. This is the written notification to the Service Provider/installer that the appointed client representative has taken over the intruder detection system installation in terms of the Agreement. Payment cannot be effected without this certificate 4) The Final Completion date for the intruder detection system installation is determined from the Hand over Certificate. The taking over date is also that date on which the warranty period is deemed to have commenced. 5) Each equipment in the installations shall be supplied with a complete installation manual and comprehensive operating instructions. In addition, cabling and wiring information, a list of all equipment with associated serial numbers, etc (as specified) and any other information that may be required by the client from time to time and a copy of the taking Over Certificate shall be provided in a A4 hard cover arch lever type file				
	Total C/F to Page F/18				

COMMUNICATIONS AUTHORITY OF KENYA
PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES
BILL No. 3: GENERAL ITEMS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh. Cts.)
	Total B/F from Page F/17				
	6) The Service Provider shall provide basic operating training on the system, using the operating instructions, for client staff prior to the Taking over Certificate being issued. This training shall be sufficient to ensure correct operation of the system. The contractor shall issue certificates to certify that the operators are proficient in the operation of the system on successful completion of the system training. 7) The above documentation shall be handed to a selected Client representative at the time of commissioning. The documentation to be as detailed below:- 8) System Documentation - all documentation relating to the installation shall be concise, complete and unambiguous. Information shall be provided sufficient to install, test and commission, operate and maintain the system. Operating instructions shall be designed to minimize the possibility of incorrect operation of the system. 9) Component documentation - documentation relating to the components of the installation system shall also be concise, complete and unambiguous. Sufficient information shall be provided to ensure the integration of the component with any other of the systemôs components. Component documentation shall include the following: i. Name of manufacturer and / or supplier. ii. Description of equipment. iii. Standard to which component claims compliance. iv. Name or mark of the certification body.		Item		
3.01	Acquire and submit a Bank Guarantee for 5% of the contract sum, as a Performance Guarantee.		Item		
3.02	Acquire and submit Insurance for the contract work.		Item		
3.03	Allow for presentation of all the required samples as per specifications, Bills of Quantities and Drawings.		Item		
	Total C/F to Page F/19				

COMMUNICATIONS AUTHORITY OF KENYA
PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES
BILL No. 3: GENERAL ITEMS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh. Cts.)
	Total B/F from Page F/18				
3.04	Prepare and submit Working Drawings as follows:- i) Draft soft copy in Archicad® and Autocad® 2000 in CD-RW. ii) Amended soft copy in Archicad® and Autocad® 2000 in CD-RW. iii) 5 Final soft copies in Archicad® and Autocad® 2000 in CD-RW to Architect, Client, Quantity Surveyor, and Engineer (2 copies) iv) 3 Draft hard copies of Working Drawings in Ao (Scales 1:50, 1:25) to Engineer, Architect and Main Contractor. v) 2 Amended hard copies of Working Drawings in Ao (Scales 1:50 and 1:25) to Engineer, Architect and Main Contractor. vi) 11 No. Final hard copies of working drawings in Ao (Scales 1:50, 1:25) to Engineer (3 copies), Architect (1 copy), Quantity Surveyor (1 copy), Client (3 copies), Contractor (3 copies). **(Note: Full set of drawings to be presented as per drawing list).**		Item		
3.05	As item no. 3.04, but for Record (As-Installed) Drawings comprising: • Fully dimensioned drawings of all plants and apparatus. • General arrangement drawings of equipment, plant etc. • Routes ï types and sizes and arrangement of all pipework. • System schematics and trunking diagrams showing all salient information relating to control and instrumentation. • Grading charts • Wiring and piping diagrams of plant and apparatus. • Schematic diagram of individual plants and switch and control boards. • All the required operating instructions for all panels, boards, control panels etc.		Item		
	Total C/F to Page F/20				

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PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES
BILL No. 3: GENERAL ITEMS

ITEM NO.	DESCRIPTION	QTY	UNIT	RATE	AMOUNT (Ksh. Cts.)
	Total B/F from Page F/19				
3.06	Warranty period for Workmanship and Equipment shall be _____ Months (A minimum of 12 months to be given)		Item		
3.07	All other items of general preliminary to cover, but not limited to:- • Attendance on all other installations that may be affected such as such as for Electrical Installations, Sound Equipment/ Wiring Installations, UPS Installations, V-Sat services etc. • Hiring and keeping a Supervisor/Foreman on site • Constant supervision of the works. • Provision of all the required spares. • Testing and Inspection of materials/works. • Provision of labour camps. • Storage of materials. • Initial maintenance (During Defects Liability) • Providing water/electricity for the works. • Protection of the works/materials • Clearing away on completion. • Preparing Final Account. • Providing all Test Certificates, etc.		Item		
	Total for General Items C/F to Summary Page				

COMMUNICATIONS AUTHORITY OF KENYA
PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES
SUMMARY PAGE

ITEM NO.	DESCRIPTION	AMOUNT KSHS. CTS.
1.00	Contract Preliminaries B/F from Part C	
2.00	Bill No. 1: Access Control Installations B/F from Page F/14	
3.00	Bill No.2: Structured LAN Cabling Platform B/F from Page F/16	
4.00	Bill No.3: General Items B/F from Page F/20	
5.00	**Sub-Total**	
6.00	**Provisional sum for Builders Work, including replacement of Glass Door Plates and Handles (Note: The sum to be expended against detailed costed builder's works and to be done by approved sub-contractors)**	**7,500,000.00**
7.00	Contingency Sum	**5,000,000.00**
	Total Amount Carried to Form of Tender	

Total Amount in words ……...

……

Anticipated Completion Period, from the receipt of Order to Testing and Commissioning of the Works

will be---------- Weeks

Tenderer's Name and Stamp ……

Signature…… **Date ……..**

PIN No. …… **VAT No. ……..**

Address ……..

Signature …….. **Date ……**

COMMUNICATIONS AUTHORITY OF KENYA
PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES

SCHEDULE OF UNIT RATES

ITEM	DESCRIPTION	UNIT	RATE (KShs)
1.00	24-port Cisco switch	No.	
1.01	GBIC transceiver modules	No	
1.02	Dual Data cable outlets, type RJ45	No	
1.03	24 Port patch panel, type RJ45 Cat. 6A	No	
1.04	Fiber optic patch panel.	No	
1.05	Purpose-made Free Standing cabinet 32 U	No	
1.06	As above but 22 U	No	
1.07	FTP level 6A structured cables.	m	
1.08	16 core multi-mode fibre	m	
1.09	Multi-media converters DMC 530 SC	No	
1.10	Fibre outlet dual MX-F-SC-01	No	
1.11	LC-SC Multimode patch cords	No	
1.12	LC-SC Multimode connectors	No	
1.13	UTP Cat 6A structured cables	m	
1.14	UTP Cat. 6A patch cord, 3M.	No	
1.15	UTP Cat. 6A patch cord, 1M	No	
1.16	RJ45 Patch Cord	No	
1.17	Cable organizer	No	
1.18	200 Pair Cat 6E Link	m	
1.19	200-pair cross connector.	No	
1.20	Door Lock	No	
1.21	Door Controller	No	
1.22	Proximity Card	No	

COMMUNICATIONS AUTHORITY OF KENYA
PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT AT CA HEADQUATERS, ELDORET AND MOMBASA OFFICES
BILL OF QUANTITIES AND SCHEDULE OF UNIT RATES
SCHEDULE OF UNIT RATES

ITEM	DESCRIPTION	UNIT (HR)	RATE (KShs)
	HOURLY RATES		
01	Unskilled labourer		
02	Semi-skilled labourer		
03	Skilled labourer		
04	Foreman		
05	Supervisor		
06	Senior Supervisor		
07	Junior Manager		
08	Manager		
09	Senior Manager		
10	Non-Executive Director		
11	Executive Director		

PART G:

FULL SERVICE MAINTENACE PER YEAR (FOR 3 YEAR) AFTER EXPIRY OF DEFECTS LIABILITY PERIOD FOR BOTH THE ACCESS CONTROL EQUIPMENT AND THE DOORS

PART G: FULL SERVICE MAINTANANCE PER YEAR (FOR 3 YEAR) AFTER EXPIRY OF DEFECTS LIABILITY PERIOD (ACCESS CONTROL EQUIPMENT AND THE DOORS)

SPECIAL NOTES

1. The tenderer is advised to note that their price shall be used in the evaluation of the tenders.

2. The maintenace is for both the Access Control equipment and all the Doors

3. The tenderer shall price for both labour and consumables (materials) during the 36 months full service period in appenix A of this section. The price shall be for supply, installation, testing and commissioning including all taxes applicable at the time of tender.

4. The tenderer shall list and price the consumable/ spare parts/ materials to be used during the 12 months full service period in appenix B of this section. The price shall be for supply, installation, testing and commissioning including all taxes applicable at the time of tender.

5. The tenderer shall list and price the consumable/ spare parts/ materials to be used during the 12 months full service period. This list is to be comprehensive as possible and shall inculde major spares as cards, fan motors etc. The price shall be for supply, installation, testing and commissioning including all taxes applicable at the time of tender. These are the spare parts that are not required during the normal routine maintenance. These spare parts shall only be paid for as and when repalced. The tenderer shall give the details of these spare parts in in appenix C of this section.

6. The price quoted for the above shall be as per the Standard Maintanance Tender Document.

7. The tenderer shall be required to the sign the 36 Months after Defects Liability Maintanance Contract based on the price quoted and the Standard Maintanance Tender Document refered to in item 5 above.

8. The tenderer **MUST** fill all the prices and rates in the Appendices A, B and C of this section. Failure to do so shall lead to disqualification.

APPENDIX 'A'

PRICE FOR FULL NORMAL ROUTINE MAINTANANCE PER YEAR AFTER DEFECTS LIABILITY PERIOD

Item	Description	Kshs	Cts
1.0	Labour costs per month		
2.0	Material costs for spare parts (consumables) per month ï see Appendix C of this section		
Sub-total for one (1No.) Month Maintenance after the Defects Liability Period (Not to be carried to Form of Tender)			
Grand Total for 12 Months Maintenance after the Defects Liability Period (Not to be carried to Form of Tender)			
Grand Total for 36 Months Maintenance after the Defects Liability Period (Not to be carried to Form of Tender)			

Signed by the Tenderer.....

Official Stamp .....

Date.....

APPENDIX 'B'

SCHEDULE OF UNIT RATES OF SPARES THAT MAY BE REQUIRED DURING 36 MONTHS AFTER DEFECTS LIABILITY MAINTENANCE PERIOD (ATTACHMENTS ARE ALLOWED IF THE LIST IS LONG)

Item	Description	Unit	Qty	Cost(Kshs.)
Total (Not to be carried to Form of Tender)				

Signed By Tenderer é ..

Official Stamp é ..

é é

Date é

APPENDIX 'C'

PRICE BREAKDOWN OF SPARES / CONSUMABLES TO BE USED DURING 36 MONTHS AFTER DEFECTS LIABILITY MAINTENANCE PERIOD

NOTE: The Price Total in this Appendix C SHOULD tally with the Grand Price Total in Appenix A of this section.

Item	Description	Unit	Qty	Cost(Kshs.)
Total (Not to be carried to Form of Tender)				

Signed By Tenderer é ..

Official Stamp é ..

é é

Date é

PART H:

TECHNICAL SCHEDULE OF ITEMS TO BE SUPPLIED

PART H: TECHNICAL SCHEDULE OF ITEMS TO BE SUPPLIED

CONTENTS

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. Manufacturerôs 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.

2. TECHNICAL SCHEDULE

ITEM	DESCRIPTION	MANUFACTURER	COUNTRY OF ORIGIN	REMARKS (Catalogue No.etc.)
1.00	24-port Cisco switch			
1.01	GBIC transceiver modules			
1.02	Dual Data cable outlets, type RJ45			
1.03	Door Controller			
1.04	. Biometric Reader.			
1.05	Proximity Card Reader			
1.06	Full Height Turnstile			
1.07	FTP level 6E structured cables.			
1.08	6 core multi-mode fibre			
1.09	Multi-media converters DMC 530 SC			
1.10	Fibre outlet dual MX-F-SC-01			
1.11	Half Height Turnstile			
1.12	Main Access Control Server			
1.13	Server Software			
1.14	UTP Cat. 6E patch cord, 3M.			
1.15	UTP Cat. 6E patch cord, 1M			
1.16	. RJ45 Patch Cord			
1.17	Cable organizer			
1.18	. 200 Pair Cat 6E Link			
1.19	200-pair cross connector.			
1.20	Power Supply Unit			
1.21	Magnetic Locks			
1.22	4-pair 0.5mm^2 /SC PVC-PVC copper telephone wire.			

PART I:

STANDARD FORMS

CONTENTS OF SECTION I

NOTE:

Tenderers must duly fill these Standard Forms as a mandatory requirement as they will form part of the evaluation criteria.

FORM OF TENDER

To: The Director General,
Communications Authority of Kenya,
P. O. Box 14448-00800,
NAIROBI.

COMMUNICATIONS AUTHORITY OF KENYA
ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT SYSTEM AT CA HEADQUARTERS, ELDORET AND MOMBASA REGIONAL OFFICES

1. In accordance with the Instructions to Tenderers, Conditions of Contract described or inferred to from the Kenya Association of Building and Civil Engineer Contractors (KABCEC), Form of Contract Agreement, 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:

   Kshsé é é é é é é .....*[Amount in figures]*

   Kenya Shillingsé .

   é .é é *[Amount in words]*

2. **Anticipated Completion Period, from the receipt of Order to Testing and Commissioning of the Works will be ---------- Weeks**
3. We undertake, if our tender is accepted, to commence the Works as soon as is reasonably possible after the receipt of the Employerôs Representativeôs notice to commence, and to phase the works in accordance with the building programme and to complete the whole of the works within the time of the main contract.
4. We agree to abide by this tender for 120 days from the date of official tender opening**,** and shall remain binding upon us and may be accepted at any time before that date.
5. 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 and the Client.
6. We understand that you are not bound to accept the lowest or any tender you may receive.
7. We submit the Name of é ..é as Surety who has signed the form attached and is willing to be bound to the Client in an amount equal to 10% of the Contract amount for the due performance of the Contract up to the date of completion of the works and who will when and if called upon sign a Bond to the offset without limitations on the same day as the Contract Agreement is signed but in the event the surety name is not approved we agree to furnish within 7 days another surety to your approval.
8. We agree in the event of your acceptance of this Tender, to execute the formal Contract Agreement within Fourteen (14) days from notification of acceptance.

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

   Signature é é é é é é é . Name é é é é é é é é é é é é é é é é é é é .

   In the capacity of é é é é é é é é é é duly authorized to sign tenders for and on behalf of:

   é é é é é é é é é é ..*[Name of Tenderer]* ofé é é é é é é ..*[Address of Tenderer]*

   PIN No. é é é é é é é é é VAT CERTIFICATE No. é é é é é é é é é é é é é é

   Witness: Name é .

   Address é .

   Signature é

NB: Tenderers are required to attach the surety undertaking, dully signed by the surety, to this Form of Tender.

FORM OF TENDER SECURITY: BANK

To: The Director General,
Communications Authority of Kenya,
P. O. Box 14448-00800,
NAIROBI.

COMMUNICATIONS AUTHORITY OF KENYA
ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT SYSTEM AT CA HEADQUARTERS, ELDORET AND MOMBASA REGIONAL OFFICES

WHEREAS..... (hereinafter called ñthe Tendererò) has submitted his tender dated.....for the installation of..... ..... (Name of Contract)

KNOW ALL PEOPLE by these presents that WE.....having our registered office at .....(hereinafter called ñthe Bankò), are bound unto .....(hereinafter called ñthe Employerò in the sum of Kshs.....for which payment well and truly to be made to the said Employer, the Bank bind itself, its successors and assigns by these presents sealed with the Common Seal of the said Bank this .....Day of é é .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 this 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 for a period of 150 days from the date of tender opening, 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 TENDER SECURITY: INSURANCE COMPANY

To: The Director General,
Communications Authority of Kenya,
P. O. Box 14448-00800,
NAIROBI.

COMMUNICATIONS AUTHORITY OF KENYA
ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT SYSTEM AT CA HEADQUARTERS, ELDORET AND MOMBASA REGIONAL OFFICES

WHEREAS..... (hereinafter called ñthe Tendererò) has submitted his tender dated.....for the installation *of*..... ..... (Name of Contract)

KNOW ALL PEOPLE by these presents that WE.....having our registered office at .....(hereinafter called ñthe Insurance Companyò) are bound unto .....(hereinafter called ñthe Employerò in the sum of Kshs.....for which payment well and truly to be made to the said Employer, the Insurance bind itself, its successors and assigns by these presents sealed with the Common Seal of the said Insurance company 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 this 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 for a period of 150 days from the date of tender opening, and any demand in respect thereof should reach the Insurance Company not later than the said date.

_____ _____
[Date] [Signature of the Guarantor]

_____ _____
[Witness] [Seal]

To: **The Director General,**
Communications Authority of Kenya,
P. O. Box 14448-00800,
NAIROBI.

Sirs,

FORM OF UNDERTAKING

We _____

of _____ , being a duly registered Commercial Bank in Kenya, are willing to act as Surety and to be bound to Communications Authority of Kenya (Client) in the sum equal to Ten percent (10%) of the Contract Sum, for the due performance by

_____ (Tenderer)

of _____

of a Contract which he/they contemplate(s) entering into with Communications Authority of Kenya (Client) for the Access Control System/Integration with Staff/Visitor Management System at CA Headquarters, Eldoret and Mombasa Regional Offices as described in this document, and the accompanying relevant drawings, according to the terms of the Performance Bank Guarantee a copy of which has been inspected by us without addition of any limitations.

We agree to enter into a Bank Guarantee under the above mentioned terms when and if called upon to do so.

Signature _____ (Surety)

Date_____

Witness _____

To be completed by proposed Surety
and returned with Tender Documents.

PERFORMANCE GUARANTEE

To: The Director General,
Communications Authority of Kenya,
P. O. Box 14448-00800,
NAIROBI.

Dear Sir,

WHEREAS é é é é é é é é é é é é é é é .(hereinafter called ñthe Contractorò) has undertaken, in pursuance of Contract No. é é é é é é é é é é dated é é é é é é to execute é é é é é é é é é é é é é é é é é é é (hereinafter called ñthe Worksò);

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Performance Guarantee by a recognised bank or approved insurance company 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 Performance 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. é é é é é é é é é é é é é é . (*amount of Guarantee in figures*)
Kenya Shillings é
é .(*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 é é é é é é é é ..
é .. (*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 é é é é é é é é é é é .

Name of Bank or Insurer é ....

Address é ...

Date é .....

TENDER QUESTIONNAIRE

Please fill in block letters.

Full names of Tenderer:

é é

Full address of Tenderer to which tender correspondence is to be sent (unless an agent has been appointed below):

é é

Telephone number (s) of Tenderer:

é é

Telex/Fax Address of Tenderer:

é é

Name of Tendererôs representative to be contacted on matters of the tender during the tender period:

é é

Details of Tendererôs 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):

é é

é é

_____

Signature of Tenderer

Make copy and deliver to: **The Director General,**
Communications Authority of Kenya,
P. O. Box 14448-00800,
NAIROBI.

:

CONFIDENTIAL BUSINESS QUESTIONNAIRE

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

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

Part 1 – General

Business Name é

Location of business premises. Country/Townè é é é é é é é é é é ...

Plot Noé é é é é é é é é é é é é Street/Road é é é é é é é é é é

Postal Addressé é é é é é é é é é é Tel Noé é é é é é é é é é é ..

Nature of Businessé é

Current Trade Licence Noé é é é é é é Expiring dateé é é é é é é é

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

Kenya Shillingsé .

Name of your bankersé ...

Branché ..

Part 2 (a) – Sole Proprietor

Your name in fullé é é é é é é é é é é é é Ageé é é é é é é é é é

Nationalityé é é é é é é é é é é é Country of Originé é é é é é é

Citizenship details é .

Part 2 (b) – Partnership

Give details of partners as follows:

	Name in full	*Nationality*	*Citizenship Details*	*Shares*
1.	é é é é é é é	é é é é é é .	é é é é é é é é é ..	é é .
2.	é é é é é é é	é é é é é é .	é é é é é é é é é ..	é é .
3.	é é é é é é é	é é é é é é .	é é é é é é é é é ..	é é .
4.	é é é é é é é	é é é é é é .	é é é é é é é é é ..	é é .

Part 2(c) – Registered Company

Private or Public é

State the nominal and issued capita of the company:

Nominal KShs. é é é é é é é ..

Issued KShs. é é é é é é é ..

Give details of all directors as follows:

	Name in full	*Nationality*	*Citizenship Details*	*Shares*
1.	é é é é é é é	é é é é é é .	é é é é é é é é é ..	é é .
2.	é é é é é é é	é é é é é é .	é é é é é é é é é ..	é é .
3.	é é é é é é é	é é é é é é .	é é é é é é é é é ..	é é .
4.	é é é é é é é	é é é é é é .	é é é é é é é é é ..	é é .

Part 2(d) Interest in the Firm:

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

I certify that the above information is correct.

é é é é é é é .. é é é é é é é é é é é . é é é é é é é .

Title Signature Date

* *Attach proof of citizenship*

KEY PERSONNEL

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

POSITION	NAME	YEARS OF EXPERIENCE (GENERAL)	YEARS OF EXPERIENCE IN PROPOSED POSITION

I certify that the above information is correct.

é é é é é é é é .. é é ...é é é é é é é . é é ...é é é é é

Title Signature Date

CONTRACTS COMPLETED IN THE LAST FIVE (5) YEARS

Work performed on works of a similar nature, complexity and volume over the last 5 years.

PROJECT NAME	NAME OF CLIENT	TYPE OF WORK AND YEAR OF COMPLETION	VALUE OF CONTRACT (Kshs.)

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

é é é é é é é é .. é é ...é é é é é é é . é é ...é é é é é

Title Signature Date

SCHEDULE OF ON-GOING PROJECTS

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

PROJECT NAME	NAME OF CLIENT	CONTRACT SUM	% COMPLETE	COMPLETION DATE

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

é é é é é é é é .. é é ...é é é é é é é . é é ...é é é é é

Title Signature Date

SCHEDULE OF MAJOR ITEMS OF CONTRACTOR'S EQUIPMENT PROPOSED FOR CARRYING OUT THE WORKS

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?)

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

List below and attach copies)

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

EVIDENCE OF FINANCIAL RESOURCES TO MEET QUALIFICATION REQUIREMENTS

(Cash in Hand, Lines of credit, e.t.c. List below and attach copies of supportive documents.)

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

BIDDER'S BANK INFORMATION

(This information is mandatory and should be for banks to provide reference if contacted by employer)

NAME OF BANK	BANK BRANCH	ACCOUNT NAME	ADDRESS	TELEPHONE

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

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

MANDATORY PRE-BID CONFERENCE AT CA HEADQUARTERS, NAIROBI

TO WHOMIT MAY CONCERN

RE. SITE VISIT FOR THE PROPOSED ACCESS CONTROL SYSTEM/INTEGRATION WITH STAFF/VISITOR MANAGEMENT SYSTEM AT CA HEADQUARTERS, ELDORET AND MOMBASA REGIONAL OFFICES

This is to confirm that

Mr./Mrs./Missé .

Of M/sé has visited

CA Centre for the purpose of getting details on tender for the Proposed Access Control System/Integration with Staff/Visitor Management at CA Headquarters, Eldoret and Mombasa Regional Offices.

Name of Tenderer

Representative é .

Signature of Tenderer

Representative é .

For Consultant's Representative (EMpaq ltd)

Name:é é

Signature:é ..

Date:é ...

For Communications Authority of Kenya

Name:é é

Signature:é ..

Date:é ...

Stamp:é ..