

VOLUME 6

CCTV AND ACCESS CONTROL INSTALLATION WORKS

PROPOSED OFFICE SPACE AT NSSF ANNEX HOUSE 10TH FLOOR FOR
PRIVATISATION COMMISSION

W. P. ITEM No. D107 NB/NB/1902 JOB No. 10759 A

*TENDER SPECIFICATIONS AND BILLS OF
QUANTITIES FOR SUPPLY, INSTALLATION, TESTING
AND COMMISSIONING OF CCTV AND ACCESS
CONTROL INSTALLATION WORKS*

SEPTEMBER, 2020

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NOTE:

TENDER EVALUATION CRITERIA

***The tenderer who shall be domestic subcontractor to the Main Contractor upon award of the tender.
Tenders to refer to the evaluation criteria provided in volume 1 of the tender.***

SECTION B

GENERAL SPECIFICATIONS

OF

MATERIALS AND WORKS

GENERAL SPECIFICATIONS OF MATERIALS AND WORKS

1. General
2. Standard of Materials
3. Workmanship
4. Procurement of Materials
5. Record Drawings
6. Regulations and Standards
7. Setting out Works
8. Testing on Site

1. GENERAL

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

2. STANDARD OF MATERIALS

- 2.1. Where the material and equipment are specifically described and named in the Specification followed by approved equal, they are so named or described for the purpose of establishing a standard to which the contractor shall adhere.
- 2.2. Should the contractor install any material not specified herein before receiving approval from the proper authorities, the Engineer shall direct the contractor to remove the material in question immediately. The fact that this material has been installed shall have no bearing or influence on the decision by the Engineer.
- 2.3. All materials condemned by the Engineer as not approved for use, are to be removed from the premises and suitable materials delivered and installed in their place at the expense of the Contractor. All materials required for the works shall be from branded manufacturers, and shall be new and the best of the respective kind and shall be of a uniform pattern.

3. WORKMANSHIP

- 3.1. The workmanship and method of installation shall conform to the best standard practice. All work shall be performed by a skilled tradesman and to the satisfaction of the Engineer. Helpers shall have qualified supervision.
- 3.2. Any work that does not in the opinion of the Engineer conform to the best standard practice will be removed and reinstated at the contractor's expense.
- 3.3. Permits, Certificates or Licences must be held by all tradesmen for the type of work; in which they are involved where such permits, certificates or licences exist under Government legislation.

4. PROCUREMENT OF MATERIALS

- 4.1. The contractor is advised that no assistance can be given in the procurement or allotment of any materials or products to be used in and necessary for the construction and completion of the work.
- 4.2. Contractors are warned that they must make their own arrangements for the supply of materials and/or products specified or required.

5. RECORD DRAWINGS

- 5.1. These diagrams and drawings shall show the completed installation including sizes, runs and arrangements of the installation. The drawings shall be to scale not less than 1:50 and shall include plan views and section.
- 5.2. The drawings shall include all the details which may be useful in the operation, maintenance or subsequent modifications or extensions to the installation.
- 5.3. Three sets of diagrams and drawings shall be provided, all to the approval of the Engineer.
- 5.4. One coloured set of line diagrams relating to operating and maintenance instructions shall be framed and, mounted in a suitable location.

6. REGULATIONS AND STANDARDS

- 6.1. All work executed by the contractor shall comply with the current edition of the “Regulations” for the Electrical Equipment of Buildings, issued by the Institution of Electrical Engineers, Electric Power Act, Kenya Bureau of Standards (KeBS), Institution of Electrical Engineers (I.E.E) Wiring Regulations, Current recommendation of CCITT and CCIR, and with the Regulations of the Local Electricity Authority and the Communications Authority of Kenya (CAK)
- 6.2. Where the sets of regulations appear to conflict, they shall be clarified with the Engineer.

7. SETTING OUT WORK

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

8. TESTING ON SITE

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

SECTION C

SCHEDULE OF CONTRACT DRAWINGS

SCHEDULE OF CONTRACT DRAWINGS

DRAWING NO.	DRAWING TITLE
As shall be issued by the Engineer	

NOTE:

Tenderers are advised to inspect the electrical drawings at the office of the **Chief Engineer (Electrical) – Ministry of Transport, Infrastructure, Housing & Urban Development, State Department of Public Works**, at Chief Engineer's (Electrical) office, Hill Plaza Building, Community area, Nairobi along Ngong road, during normal working hours.

The drawings shall however be availed, on award of the tender, to the nominated sub-contractor.

SECTION D

PARTICULAR AND TECHNICAL SPECIFICATIONS

OF

MATERIALS AND WORKS

PARTICULAR AND TECHNICAL SPECIFICATIONS OF MATERIALS AND WORKS
FOR STRUCTURED CABLING WORKS

TELECOMMUNICATIONS DISTRIBUTION SYSTEM – STRUCTURED CABLING

PART 1/1

A. GENERAL TECHNICAL SPECIFICATIONS

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

1. REFERENCES

- a. Design, manufacture, test, and install telecommunications cabling networks per manufacturer's requirements and in accordance with NFPA-70 (*National Electrical Code®*)/IEEE Regulations, state codes, local codes, requirements of authorities having jurisdiction, and particularly the following standards: ANSI/NECA/BICSI-568 -- Standard for Installing Commercial Building Telecommunications Cabling ANSI/TIA/EIA Standards.
 - 1) ***ANSI/TIA/EIA-568-B.1 -- Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements***
 - 2) ***ANSI/TIA/EIA-568-B.2 -- Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components***
 - 3) ***ANSI/TIA/EIA-568-B.3 -- Optical Fiber Cabling Components Standard***
 - 4) ***ANSI/TIA/EIA-569-A -- Commercial Building Standard for Telecommunications Pathways and Spaces***
 - 5) ***ANSI/TIA/EIA-606(A) -- The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings***
 - 6) ***ANSI/TIA/EIA-607(A) -- Commercial Building Grounding and Bonding Requirements for Telecommunications***

- 7) **ANSI/TIA/EIA-526-7 -- Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant**
- 8) **ANSI/TIA/EIA-526-14A -- Measurement of Optical Power Loss of Installed Multimode Fiber Cable Plant**
- 9) **ANSI/TIA/EIA-758(A) -- Customer-Owned Outside Plant Telecommunications Cabling Standard**
- 10) **ISO/IEC 1101 Amendment 2**

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

1. **PERMITS, FEES, AND CERTIFICATES OF APPROVAL**

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

2. **SYSTEM DESCRIPTION**

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

3. SUBMITTALS

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

1) By submitting shop drawings, product data, and samples, the contractor represents that he or she has carefully reviewed and verified materials, quantities, field measurements, and field construction criteria related thereto. It also represents that the contractor has checked, coordinated, and verified that information contained within shop drawings, product data, and samples conform to the requirements of the work and of the contract documents. The engineer/designer remains responsible for the design concept expressed in the contract documents as defined herein.

2) The P.M approval of shop drawings, product data, and samples submitted by the contractor shall not relieve the contractor of responsibility for deviations from requirements of the contract documents, unless the contractor has specifically informed the engineer/designer in writing of such deviation at time of submittal, and the engineer/designer has given written approval of the specific deviation. The contractor shall continue to be responsible for deviations from requirements of the contract documents not specifically noted by the contractor in writing, and specifically approved by the engineer in writing.

3) The P.M approval of shop drawings, product data, and samples shall not relieve the contractor of responsibility for errors or omissions in such shop drawings, product data, and samples.

4) The P.M review and approval, or other appropriate action upon shop drawings, product data, and samples, is for the limited purpose of checking for conformance with information given and design concept expressed in the contract documents. The engineer's review of such submittals is not conducted for the purpose of determining accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the contractor as required by the contract documents.

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

b. Shop drawings: Submit the following:

Coordinate with Part 2.

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

c. Product Data -- Provide catalog cut sheets and information for the following:

Coordinate with Part 2.

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

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

e. Project record drawings:

1) Submit project record drawings at conclusion of the project and include:

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

4. QUALITY ASSURANCE

- 1.1 The contractor shall have worked satisfactorily for a minimum of five (5) years on systems of this type and size.
- 1.2 Upon request by the P.M, furnish a list of references with specific information regarding type of project and involvement in providing of equipment and systems.

- 1.3 Equipment and materials of the type for which there are independent standard testing requirements, listings, and labels, shall be listed and labeled by the independent testing laboratory.
- 1.4 Where equipment and materials have industry certification, labels, or standards (i.e., NEMA - National Electrical Manufacturers Association), this equipment shall be labeled as certified or complying with standards.
- 1.5 Material and equipment shall be new, and conform to grade, quality, and standards specified. Equipment and materials of the same type shall be a product of the same manufacturer throughout.
- 1.6 Subcontractors shall assume all rights and obligations toward the contractor that the contractor assumes toward the client and P.M.

5. WARRANTY

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

6. DELIVERY, STORAGE, AND HANDLING

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

7. SEQUENCE AND SCHEDULING

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

8. USE OF THE SITE

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

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

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

PART 2/1 - PRODUCTS

1. MANUFACTURERS

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

2. FABRICATION

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

3. SUITABILITY

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

4. VOICE/DATA TELECOMMUNICATIONS SERVICE BACKBONE CABLE

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

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

5. VOICE TELECOMMUNICATIONS STATION CABLE

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

6. DATA STATION CABLE (Copper)

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

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

7. DATA STATION CABLE (Optical Fiber)

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

8. UNDERGROUND TELECOMMUNICATIONS CABLE (Copper)

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

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

9. UNDERGROUND TELECOMMUNICATIONS CABLE (Optical Fiber)

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

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

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

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

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

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

- a. Data Outlet - 8-pin modular, category 6e, unkeyed, black, pinned to either T568 (A or B) standards.
- b. Optical Fiber Connectors – simplex ST - ST adapter.
Provide two optical fiber adapters for each faceplate

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

Single-gang mounting plate with four (4) openings containing the following devices:

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

12. VOICE ONLY WORK AREA OUTLET

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

13. TERMINATION BLOCKS

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

- a. Product(s) as approved by the P.M: Wiring blocks are to be in following configurations:
 - 1) List dimensional configurations
 - 2) ER – List pairs categorized for PBX portion of ER and pairs field terminated for backbone and CO portion of ER

Provide wiring troughs between ER frame sections.

14. PATCH PANELS

Specification Note: Alter quantities to match job requirements.

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

15. WALL MOUNTED OPTICAL FIBER PATCH PANELS

Specification Note: Alter quantities to match job requirements

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

16. RACK MOUNTED OPTICAL FIBER TERMINATION PANEL

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

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

17. *SPLICE TRAYS*

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

18. OPTICAL FIBER CONNECTORS

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

19. OPTICAL FIBER JUMPERS

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

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

20. OPTICAL FIBER PIGTAILS

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

21. OPEN FRAME EQUIPMENT RACK

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

22. EQUIPMENT RACKS/CABINETS

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

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

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

23. LISTED BUILDING ENTRANCE PROTECTORS

Use when copper cables are run outside of building.

Use appropriate protector modules.

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

24. SPLICE HOUSING

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

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

25. SPARES

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

a. Furnish the following spare equipment and parts:

Terminal block connectors, if required

Test set cords, if required

Install one test cord set in each telecommunications closet

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

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

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

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

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

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

EXECUTION

1. PRE-INSTALLATION SITE SURVEY

a. Prior to start of systems installation, meet at the project site with the P.M and representatives of trades performing related work to coordinate efforts. Review areas of potential interference and resolve conflicts before proceeding with the work. Facilitation with the Client will be necessary to plan the crucial scheduled completions of the equipment room and telecommunications closets.

b. Examine areas and conditions under which the system is to be installed. Do not proceed with the work until satisfactory conditions have been achieved.

2. HANDLING AND PROTECTION OF EQUIPMENT AND MATERIALS

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

3. PROTECTION OF OWNER'S FACILITIES

a. Effectively protect the client's facilities, equipment, and materials from dust, dirt, and damage during construction.

b. Remove protection at completion of the work.

4. INSTALLATION

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

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

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

- 1) Where manufacturer does not provide bending radii information, minimum-bending radius shall be 15 times cable diameter. Arrange and mount equipment and materials in a manner acceptable to the P.M and the client.
- e. Penetrations through floor and fire-rated walls shall utilize intermediate metallic conduit (IMC) or galvanized rigid conduit (GRC) sleeves and shall be fire stopped after installation and testing, utilizing a fire stopping assembly approved for that application.
- f. Install station cabling to the nearest telecommunications room (TR), unless otherwise noted.
- g. Installation shall conform to the following basic guidelines:
 - 1) Use of approved wire, cable, and wiring devices
 - 2) Neat and uncluttered wire termination
- h. Attach cables to permanent structure with suitable attachments at intervals of 1200-1500mm. Support cables installed above removable ceilings.
- i. Install adequate support structures for 10 foot of service slack at each TR.
- j. Support riser cables every floor and at top of run with cable grips.
 - 1) Limit number of four-pair data riser cables per grip to fifty (50)
- k. Install cables in one continuous piece. Splices shall not be allowed except as indicated on the drawings or noted below:
- l. Provide over voltage protection on both ends of cabling exposed to lightning or accidental contact with power conductors.

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

5. GROUNDING

Edit as required.

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

6. LABELING

Use 6d if the type of termination block permits labels. Otherwise use 6e.

Use 6g if the owner does not have a standard for outlet numbering.

Use 6h if required. Alter time as requested.

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

- a. Label each outlet with permanent self-adhesive label with minimum 3/16 in. high characters.
- b. Label each cable with permanent self-adhesive label with minimum, 1/8 in. high characters, in the following locations:
 - 1) Inside receptacle box at the work area.
 - 2) Behind the communication closet patch panel or punch block.
- c. Use labels on face of data patch panels. Provide facility assignment records in a protective cover at each telecommunications closet location that is specific to the facilities terminated therein.
- d. Use color-coded labels for each termination field that conforms to ANSI/TIA/EIA-606(A) standard color codes for termination blocks.
- e. Mount termination blocks on color-coded backboards.
- f. Labels shall be machine-printed. Hand-lettered labels shall not be acceptable.
- g. Label cables, outlets, patch panels, and punch blocks with room number in which outlet is located, followed by a single letter suffix to indicate particular outlet within room, i.e., S2107A, S2107B. Indicate riser cables by an R then pair or cable number.
- h. Mark up floor plans showing outlet locations, type, and cable marking of cables. Turn these drawings over to the owner two (2) weeks prior to move in to allow the owner's personnel to connect and test owner-provided equipment in a timely fashion.
- i. Three (3) sets of as-built drawing shall be delivered to the owner within four (4) weeks of acceptance of project by the owner. A set of as-built drawings shall be provided to the owner in magnetic media form (3.5" floppy disks) and utilizing CAD software that is acceptable to the owner. The magnetic media shall be delivered to the owner within six (6) weeks of acceptance of project by owner.

7. TESTING

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

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

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

Use 2 or 3 as required.

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

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

- 4) If horizontal cable contains bad conductors or shield, remove and replace cable. Initially test optical cable with a light source and power meter utilizing procedures as stated in ANSI/TIA/EIA-526-14A: *OFSTP-14A Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant* and ANSI/TIA/EIA-526-7 *Measurement of Optical Power Loss of Installed Single mode Fiber Cable Plant*. Measured results shall be plus/minus 1 dB of submitted loss budget calculations. If loss figures are outside this range, test cable with optical time domain reflectometer to determine cause of variation. Correct improper splices and replace damaged cables at no charge to the owner.
 - 1) Cables shall be tested at 850 and 1300 nm for multimode optical fiber cables. Cables shall be tested at 1310 and 1550 nm for single mode optical fibers.
 - 2) Testing procedures shall utilize “Method B” – One jumper reference.
 - 3) Bi-directional testing of optical fibers is required.
- d. Perform optical time domain reflectometer (OTDR) testing on each fiber optic conductor. Measured results shall be plus/minus 1 dB of submitted loss budget calculations.
 - 1) Submit printout for each cable tested.
 - 2) Submit 3.5 in. disks with test results and program to view results.
- e. Where any portion of system does not meet the specifications, correct deviation and repeat applicable testing at no additional cost.

FIELD QUALITY CONTROL

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

PART 2/1:

**PARTICULAR AND TECHNICAL SPECIFICATIONS OF MATERIALS AND WORKS
FOR IP-CCTV SURVEILLANCE AND ACCESS CONTROL INSTALLATION WORKS**

	CLAUSE	DESCRIPTION
	PART 2	
1.00		Particular specifications
1.01		Description of the Site
1.02		Description of the Project
1.03		Climatic Conditions
1.04		Regulations
1.05		Electrical Requirements
1.06		Mandatory Requirements
1.07		Position of Services and Equipment
1.08		Setting to Work and Regulating Systems
1.09		Identification of Plant Components
1.10		Working Drawings
1.11		Record Drawings
1.12		Tests
1.13		Quality Materials
1.14		Training
1.15		Equipment Guarantee
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	PART 3	
2.00		Technical Specifications for the IP-CCTV Cameras System
2.01		Extent of Works for Security Surveillance System
2.02		Working Drawings
2.03		Minimum Allowable Technical Specifications for the IP-CCTV Cameras System
2.04		Minimum Requirements for Proposed IP-CCTV Cameras System
2.05		Mounting Brackets
2.06		Camera Housing
2.07		Color Video Monitors
2.08		Color Digital Network Video Multiplexing Recorder
2.09		CCTV Management Software
2.10		Uninterruptible Power Supply (UPS)
2.11		Cables and Connectors
2.12		Patch Panels
2.13		Network Control Equipment at the Network Core
2.14		Labelling
2.15		Network Cabinet
2.16		Ethernet Floor EDGE Switches
2.17		Optical Fibre Cable
2.18		Fibre Patch Panels
2.19		Backbone
2.20		Network Management System
2.21		Brochures and Technical Literature

PART 4

- 4.00 Technical Specifications for Computers and Accessories
- 4.01 Specifications for Desktop Computer
- 4.02 Specifications for Laptop Computer
- 4.03 Specifications for Medium Duty Laser Printer
- 4.04 Specifications for Light Duty UPS

PART 2

1.00 PARTICULAR SPECIFICATIONS – IP-CCTV INSTALLATION WORKS

1.01 DESCRIPTION OF THE SITE

The site of the proposed works is located at **at 10th Floor, NSSF Annex House – Nairobi County**

1.02 DESCRIPTION OF THE PROJECT

The works comprise the Supply, Installation, Testing and Commissioning and leaving in servicing condition the IP Based Closed Circuit Television Cameras and Access Control Systems in the Proposed Construction of a Tuition Block at Kenya School of Government - Baringo. as herein described in the specifications. The works shall include but not limited to the Supply and Installation of the following;

- IP Cameras
- Network Video Recorders
- LED Monitors
- Cabling of the CCTV and all Associated Works

1.03 CLIMATIC CONDITIONS

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

Mean Maximum Temperatures 32°C

Mean Minimum Temperature 17.4°C

Range of Relative humidity 39% - 97%

Salt in the atmosphere 0.02%

Altitude 1095M above sea level

Latitude /Longitude 00°21' N/37°35' E

Solar Radiation, February Mean Max 630 Langleys

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

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

1.04 REGULATIONS

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

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

1.05 ELECTRICAL REQUIREMENTS

The equipment to be supplied shall be capable of being operated from 240V AC, 50Hz power supply.

1.06 MANDATORY REQUIREMENTS

- a) All equipment and materials used shall be standard components that are regularly manufactured and used in the manufacturer's system.
- b) All systems and components shall have been thoroughly tested and proven in actual use.
- c) All systems and components shall be provided with the availability of a, 24-hour technical assistance program (TAP) from the manufacturer. The TAP shall allow for immediate technical assistance for either the dealer/installer or the end user at no charge.
- d) All systems and components shall be provided with a one-day turn around repair express and 24-hour parts replacement. The repair and parts express shall be guaranteed by the manufacturer on warranty and non-warranty items.
- e) The supplier shall be the manufacturer, or the manufacturer appointed agent (proof to be submitted).
- f) The Offered system has been installed and commissioned by the supplier in other locations.
- g) **The proposal will include operators training in Kenya and system manager factory training (at the manufacturer training facility).**

1.07 POSITION OF SERVICES AND EQUIPMENT

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

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

1.08 SETTING TO WORK AND REGULATING SYSTEMS

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

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

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

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

1.09 IDENTIFICATION OF PLANT AND COMPONENTS

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

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

1.10 WORKING DRAWINGS

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

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

1.11 RECORD DRAWINGS

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

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

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

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

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

1.12 TESTS

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

1.13 QUALITY OF MATERIALS

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

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

1.14 TRAINING

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

1.15 EQUIPMENT GUARANTEE

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

1.16 PATENT RIGHTS

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

PART 3

2.00 TECHNICAL SPECIFICATIONS FOR THE IP-CCTV CAMERAS SYSTEM

2.01 EXTENT OF WORKS FOR SECURITY SURVEILLANCE SYSTEM

The security surveillance system should consider the following.

IP CCTV Camera. The cameras specified should be able to cover the distance with clear pictures. Consider whether there shall be need to support the fixed digital cameras with the Pan, Tilt and Zoom Cameras or not. Highly sensitive areas should be covered with more cameras able to take pictures of any person coming in both from the front and the rear. The resolution of the cameras should be able to give motion pictures that are clear.

LED Monitors.

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

(State make and type, and enclose catalogues)

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

The IP CCTV Surveillance system should be able to support the following;

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

- Efficient video collection, storage and retrieval.
- Advanced and instant search capability
- Digitally signed recordings, with audit trails of all operator actions and system event.
- Storage capacity of the Network Video Recorder. Space to provide at least three months continuous recording and back up for automatic archiving for one year and redundancy
- Infra-red illuminators in poor lighting conditions
- Able to interface with other systems on the ground
- Support IP and PoE connectivity.

2.02 WORKING DRAWINGS

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

2.03 MINIMUM ALLOWABLE TECHNICAL SPECIFICATIONS FOR THE CCTV SYSTEM

2.03.1 GENERAL SPECIFICATIONS FOR THE CAMERAS

The cameras are classified into two main types

a) Fixed cameras –

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

They can be used in indoor and outdoor depending on the requirements.

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

b) Pan Tilt and Zoom Cameras

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

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

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

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

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

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

The digital signal processing (DSP) camera shall be aesthetically styled. The DSP chip will enable advanced video processing and manipulation to be carried out in the camera head.

2.04 MINIMUM REQUIREMENTS FOR THE PROPOSED CCTV SYSTEM

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

a) IP Bullet camera

- 5 Mega Pixel Full HD Outdoor IP Bullet Camera with Infrared
- Built in Infrared 25 meters minimum
- imaging sensor – 1/2.8” minimum
- Wide Dynamic Range – 120dB
- Motorized Varifocal Auto Iris lens
- Day and night vision; Minimum illumination 0.08lux (colour), 0lux (B/W) IR on
- Focal Length – 3~8mm
- IP network capable
- PoE capability
- H.265 video compression
- Accessible edge storage with 64GB internal MicroSD card slot
- True day and night vision capability
- Tampering detection, Face detection, Audio Detection, Motion detection and event triggered alarm processing.
- Masking Capability,
- Vandal proof IK-10 rating housing
- Weather proof IP66 rating
- ONVIF Compliant

(State make and type, and enclose catalogues)

b) IP Dome CCTV Camera

- 5 Mega Pixel Full HD IP Dome Camera with Infrared
- Built in Infrared 20 meters minimum
- imaging sensor – 1/2.8” minimum
- Wide Dynamic Range – 120dB
- Motorized Varifocal Auto Iris lens
- Day and night vision; Minimum illumination 0.1lux (colour), 0lux (B/W) IR on
- Focal Length – 3~8mm
- IP network capable
- PoE capability
- H.265 video compression
- Accessible edge storage with 64GB internal MicroSD card slot
- True day and night vision capability

- Tampering detection, Face detection, Audio Detection, Motion detection and event triggered alarm processing
- Masking Capability,
- Vandal proof IK-10 rating housing
- Weather proof IP66 rating
- ONVIF Compliant

(State make and type, and enclose catalogues)

c) Mini Dome/Fisheye CCTV Camera

- 5 Mega Pixel Full HD IP
- imaging sensor – 1/2” minimum
- Wide Dynamic Range – 120dB
- angular field of view of at least H:180°; V:180°; D:180°
- Day and night vision; Minimum illumination 0.5lux (colour), 0lux (B/W) IR on
- IP network capable
- PoE capability
- H.265 video compression
- Accessible edge storage with 128GB internal MicroSD card slot
- True day and night vision capability
- Tampering detection, Audio Detection, Motion detection and event triggered alarm processing
- Masking Capability,
- Vandal proof IK-10 rating housing
- Weather proof IP66 rating
- ONVIF Compliant

(State make and type, and enclose catalogues)

d) IP Box CCTV Camera

- 5 Mega Pixel Full HD IP box Camera
- imaging sensor – 1/2.8” minimum
- Wide Dynamic Range – 120dB
- Auto Iris lens
- Day and night vision; Minimum illumination 0.1lux (colour), 0lux (B/W) IR on
- Focal Length – 3~8mm
- IP network capable
- PoE capability
- H.265 video compression
- Accessible edge storage with 128GB internal MicroSD card slot
- True day and night vision capability
- Tampering detection, Face detection, Audio Detection, Motion detection and event triggered alarm processing
- Masking Capability,
- Vandal proof IK-10 rating housing
- Weather proof IP66 rating
- ONVIF Compliant

(State make and type, and enclose catalogues)

e) IP PTZ CCTV Camera

- 5 Mega Pixel Full HD IP Dome Camera with Infrared
- Built in Infrared 100 meters minimum
- imaging sensor – 1/2.8” minimum
- Wide Dynamic Range – 120dB
- Varifocal Auto Iris lens
- Minimum Adjustable digital zoom 16x, optical zoom 32x
- Day and night vision; Minimum illumination 0.1lux (colour), 0lux (B/W) IR on
- Focal Length – 4.4~140.8mm
- IP network capable
- PoE capability
- H.265 video compression
- Accessible edge storage with 64GB internal MicroSD card slot
- True day and night vision capability
- Tampering detection, Face detection, Audio Detection, Motion detection and event triggered alarm processing
- Masking Capability,
- Vandal proof IK-10 rating housing
- Weather proof IP66 rating
- Heater, Blower and Defog
- Auto tracking
- ONVIF Compliant

(State make and type, and enclose catalogues)

2.05 MOUNTING BRACKETS

The Brackets shall:

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

Be at least 5.5"length

Have an auto lock facility.

2.06 CAMERA HOUSING

The camera housing shall:

Be IP66 rated with integral cable management.

Be Weatherproof and constructed from aluminum with epoxy coating.

2.07 COLOR VIDEO MONITORS

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

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

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

Type:	LED; 50,000hours panel life
System:	NTSC/PAL
Screen Size:	40”
Resolution:	1,920 x 1, 080
Display Colour:	16.0 million

Brightness:	350cd/m ²
Contrast Ratio:	5,000:1
Video input signal:	1.0 V pk-pk
Power consumption:	Not more than 80W
Power input:	240V, 50HZ
Interface:	VGA, DVI, HDMI, RGB, Audio, Video

(State make and type, and enclose catalogues)

2.08 NETWORK VIDEO RECORDER

The network video recorder shall have the following minimum requirements:

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

(State make and type, and enclose catalogues)

2.09 CCTV MANAGEMENT SOFTWARE

CCTV management software with the following minimum specifications: -

- Event Recording Scheme
- Operate Motion-Detector-Recording
- NTSC-PAL video recording.
- Be capable of recording real time images at full resolution and frames rate.
- Features for connection for alarm system Automatic Recycling
- Users' passwords.
- Input, Output, Audio Alert Facilities
- Remote Viewing Facilities, TCP/IP, INTERNET, ISDN, modem
- Capability of streaming into the client's existing LAN / WAN infrastructure
- Ability to quickly search through thousands of hours of recorded video information
- Event-triggered video recording to reduce storage requirements
- Masks out disturbing areas, or areas of no interest, within the specified region
- Identifies & immediately alerts user to potential security breaches
- Features should be able to be used at very low frame rates
- Easy calibration for specific applications

- Color-matching matches user-specified colour to the video image
- Functions in outside environments with changing light conditions:
 - Auto-learning of background feature
 - Object saliency and object Consistency mechanisms to filter out phantom objects
 - “Out of Focus” condition is user-calibrated by level of focus
- Automatic self-test of camera validity
- Motion Trajectory Analyzer provides advanced analysis of the motion of objects
- Seamless integration into Enterprise security knowledge management solution.
- Analysis of stationary objects

(State make and type, and enclose catalogues)

2.10 UNINTERRUPTIBLE POWER SUPPLY (UPS)

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

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

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

- input power problems
- ups faults
- ups overload
- battery discharging

Other parameters are:

Input supply:	240VAC50HZ
Power factor:	0.8 lag at full load
Current limit:	125% of the normal
Output voltage:	240V AC 50 HZ
Output voltage tolerance:	2%
Output frequency tolerance:	0.05%

(State make and type, and enclose catalogues)

2.11 CABLING

- a. All cables must pass through conduits or trunking.
- b. All cables and connectors shall be labeled.
- c. No distortion due to kinks, sharp bends or excessive hauling tension shall be allowed.
- d. Cables shall be run in a manner eliminating any possibility of strain on the cable itself or on the terminations.
- e. Cables shall have no joints or splices.
- f. Cables shall be kept at a minimum distance of 150mm from items liable to become hot or cold.

- g. Bending radii shall be not less than eight times the overall cable diameter.
- h. The manufacturers hauling tension shall not be exceeded.
- i. All cable ties and fixings shall be tightened to support the cable loom without distortion of the cable sheath.
- j. The UTP 4 pair shall be of Solid copper, 24 AWG, 100 Ω balanced twisted-pair (UTP) Category 6E cables with four individually twisted-pairs, which meet or exceed the mechanical and transmission performance specifications in ANSI/TIA/EIA-568-B.2 up to 100 MHz. Cat 6E Structured Cabling shall be used throughout the entire installation.

(State make and type, and enclose catalogues)

2.12 PATCH PANELS

- a) Shall conform to ANSI/TIA/EIA-568A and rack mounted.
- b) Shall be equipped with RJ45 contacts of Cat 6 sockets with capacity of 12, 24 or 48 ports.
- c) Shall be earthed.
- d) Except for patch cords used to connect NICs to the RJ45 sockets, all patch cords shall be labeled at each extremity with PVC support and intelligible marking. For other components the label shall be of stiff plastic PVC type.

(State make and type, and enclose catalogues)

2.13 ACTIVE NETWORK CONTROL EQUIPMENT AT THE NETWORK CORE

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

- a. Backplane/switch fabric Bandwidth Capacity of 150 GBPS or more.
- b. IEEE 802.3 compliant for power over Ethernet
- c. IEEE 802.1 based security compliant
- d. SNMP compliant for security
- e. Layer 2/3/4 switch
- f. Should support Gigabit Ethernet to the desktop
- g. Should have at least 24-slots or higher chassis.
- h. The core switches should have two links to each edge switch configured in active/active configuration. The links should deliver 2GBPS throughput when all ports are active.
- i. The core switch should have redundant power supply, redundant fan tray and redundant CPU/ supervisor engine installed
- j. Fiber cable linking stacks on each edge switch to the core should be connected to 1000Base X(GBIC) port on the core switch using star topology
- k. Should be installed with the latest version of system software at the time of delivery.
- l. Should support Quality of service for various applications.
- m. Active devices shall be rack mounted.
- n. Active devices used at the LAN edge must be stackable and shall attach to the backbone cabling at 1000mbps.
- o. Where more than one active device is required to satisfactorily serve the floor data outlet distribution requirements they shall be stacked using interface operating at the backbone speed.

(State make and type, and enclose catalogues)

2.14 LABELING

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

2.15 NETWORK CABINET

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

(State make and type, and enclose catalogues)

2.16 ETHERNET FLOOR EDGE SWITCHES

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

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

(State make and type, and enclose catalogues)

2.17 OPTICAL FIBRE CABLE

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

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

(State make and type, and enclose catalogues)

2.18 FIBER PATCH PANELS

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

(State make and type, and enclose catalogues)

2.19 BACK BONE

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

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

2.21 BROCHURES AND TECHNICAL LITERATURE

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

PART 4

3.00 TECHNICAL SPECIFICATIONS FOR THE ACCESS CONTROL SYSTEM

3.01 EXTENT OF WORKS FOR ACCESS CONTROL SYSTEM

The main components of an access control system are:

- a) Intelligent System Controller and Server
- b) The proximity card reader
- c) The proximity cards
- d) The magnetic locks
- e) Biometric readers

3.02 THE IP BASED INTELLIGENT SYSTEM CONTROLLER

The controller is the main item for control access system.

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

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

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

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

It shall have the following features;

- Bi- processor Central Processing Unit
- With lead battery back-up with four (4 hrs.) hours autonomy in case of network failure.
- Autonomous clock/calendar chip with automatic management of regular/daylight saving time with autonomy of one hour.
- Management of peer to peer connection with other servers and as a consequence a high decision making capability and full operative autonomy.
- Up to 2500 transactions stored on a removable cartridge with a flash EPROM memory.
- The controller shall be capable of controlling 1No.(one) or 2 No.(two) doors in a stand – alone mode and shall have IP based access functionality.
- Should Have TCP/IP RS485 communication compatibility
- The controller shall have a built in power supply, with a battery backup facility and sufficient power to drive two locks.
- Minimum 4-relays output, 4 readers interface support and Wiegand reader support
- 8 input port for door open sensor monitoring and exit button and minimum 2 user defined input port for link with alarm system.
- 12C Bus Expansion Slot

- In built surge protection
- Control software with access to alarm monitoring, time zones, supervision, activity reports etc.
- The control should be able to provide time zoning, extensive door monitoring, logging of all events and hardware alarms – output, and also real time monitoring.
- Users parameters shall be done locally in the stand alone via a portable and easy to use compact programme using the English Languages Software.
- The controller should be able to use the magstripe cards or the magnetically encoded keys as identifiers.
- The card readers shall have a Pin-pad.
- The power for the reader and for the electric lock shall be supplied via the controller.
- **MUST** have a staff attendance Management System capability.

The server as specified by the Engineer should be able to store the transactions for a minimum of two months. The speed of the server to be such that the programming and communication between the card readers and other interface units is fast.

3.03 BIOMETRIC (FINGER AND RFID) AND PROXIMITY CARD READER

- Shall have biometric state of the art finger print reader.
- Shall have an Embedded web server
- Be Bi-directional and meets requirements for HID Proximity cards (standard ISO/ABA 125 KHz, up to 4cm of distance).
- Have Alphanumeric Liquid Crystal Display (LCD), back lit, with two lines of 16 characters each, for the visualization of time data, guide messages for the user, and service messages.
- Should have 2 multicolor LED: Green for the access granted, Red for invalid transaction, Yellow for Echelon Service function.
- Variable Tones for valid/invalid transactions.
- Have a USB Port, RS-485 communication interface, contactless read/write smart card technology Lon Works cabling Interface should be done using unshielded twisted pair cable in free topology. (Transceiver FTT10A, 78Kbps).
- Meets IP65 level of protection and vandal resistant (IK08)
- At least 1000 valid cards capacity.
- At least 30,000 templates, 250,000 IDs in authorized user list, 1 Million logs
- It should be able rated to operate within 0°C ÷ +50°C temperature range.
- It should be rated to operate up to a relative humidity 95% without condensation or as otherwise specified by the engineer for special cases.
- Must meet all laid down international Electromagnetic Compatibility standards.

3.04 PROXIMITY CARD

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

3.05 MAGNETIC DOOR CONTACTS

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

3.06 DOOR ACCESS CONTROLLER

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

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

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

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

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

The card readers shall have a Pin-pad.

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

3.07 MAGESTRIPS CARD

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

3.08 DOOR CONTACTS

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

3.09 UNINTERRUPTIBLE POWER SUPPLY (UPS)

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

It shall be microprocessor- based so that both output voltage and frequency are closely regulated and continuously monitored and also provide system diagnostic and shut down protection functions.

It shall feature a maintenance by-pass to enable normal routine maintenance operations to be performed without interruptions to the system.

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

- input power problems
- ups faults
- ups overload
- battery discharging

Other parameters are:

Input supply:	240VAC50HZ
Power factor:	0.7 lag at full load
Current limit:	125% of the normal
Output voltage:	240V AC 50 HZ
Output voltage tolerance:	2%
Output frequency tolerance:	0.05%

3.10 ACCESS CONTROL SERVER CONTROLLER

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

3.11 BIOMETRIC CLOCKING MACHINE

- Shall have biometric state of the art finger print reader.
- Be Bi-directional and meets requirements for HID Proximity cards (standard ISO/ABA 125 KHz, up to 4cm of distance).
- Have Alphanumeric Liquid Crystal Display (LCD), back lit, with two lines of 16 characters each, for the visualization of time data, guide messages for the user, and service messages.
- Should have 2 multicolor LED: Green for the access granted, Red for invalid transaction, Yellow for Echelon Service function.
- Variable Tones for valid/invalid transactions.
- Have a USB Port, RS-485 communication interface, contactless read/write smart card technology Lon Works cabling Interface should be done using unshielded twisted pair cable in free topology. (Transceiver FTT10A, 78Kbps).
- Meets IP31 level of protection.
- At least 1,000 fingerprint user capacity.
- At least 1,000 valid cards capacity.
- It should be able rated to operate within 0°C ÷ +50°C temperature range
- It should be rated to operate up to a relative humidity 95% without condensation or as otherwise specified by the engineer for special cases.
- Must meet all laid down international Electromagnetic Compatibility standards

3.14 BROCHURES AND TECHNICAL LITERATURE

Tenderers **Must** enclose together with their submitted bids brochures detailing technical Literature and specifications of the Access Control System. The brochures shall be used to evaluate the suitability of the system and the associated accessories. **Any bid submitted without the brochures shall be considered technically non-responsive, and shall subsequently be disqualified.**

SECTION E

SCHEDULE OF UNIT RATES

SCHEDULE OF UNIT RATES

1. The tenderer shall insert unit rates against the items in the following schedules and may add such other items as he considers appropriate.
2. The unit rates shall include for supply, transport, insurance, delivery to site, storage as necessary, assembling, cleaning, installing, connecting, profit and maintenance in defects liability and any other obligation under this contract.
3. The unit rates will be used to assess the value of additions or omissions arising from authorised variations to the contract works.
4. Where trade names or manufacturer's catalogue numbers are mentioned in the specification, the reference is intended as a guide to the type of article or quality of material required. Alternative brands of **equal** and **approved** quality will be accepted.
5. The prices quoted shall be deemed to include for all obligations under the sub-contract including but not limited to supply of materials, labour, delivery to site, storage on site, installation, testing, commissioning and all taxes (including **16% V.A.T, 3 % Withholding tax and all other taxes applicable at the time of tender**).

SCHEDULE OF UNIT RATES

(To be completed by the Tenderer)

NO	DESCRIPTION	QTY	UNIT	RATE (KSH)
	Supply and Install the following: -			
1.	Proximity reader with face recognition, biometric reader, card reader and keypad	1	No.	
2.	CAT 6A UTP 4-Pair Cable	1	LM	
3.	32U Cabinet	1	No.	
4.	22U Cabinet	1	No.	
5.	Biometric Staff Attendance Clocking Machine with finger reader, card reader and keypad	1	No.	
6.				
7.				
8.				
9.				
10.				
11.				
12.				

SECTION F

BILLS OF QUANTITIES

BILLS OF QUANTITIES

A) PRICING OF PRELIMINARIES ITEMS

Prices will be inserted against item of preliminaries in the Contractor's Bills of Quantities and specification. These Bills are designated as Bill No.1 in this Section. Where the Contractor fails to insert his price in any item he shall be deemed to have made adequate provision for this on various items in the Bills of Quantities. The preliminaries form part of this contract and together with other Bills of Quantities covers for the costs involved in complying with all the requirements for the proper execution of the whole of the works in the contract.

The Bills of Quantities are divided generally into three sections:

(a) Preliminaries – Bill No.1

Contractor's preliminaries are as per those described in section C – Contract Preliminaries and General Conditions of Contract. The Contractor shall study the conditions and make provision to cover their cost in this Bill. The number of preliminary items to be priced by the Tenderer has been limited to tangible items such as site office, temporary works and others. However, the Tenderer is free to include and price any other items he deems necessary taking into consideration conditions he is likely to encounter on site.

(b) Installation Items – Other Bills

- (i) The brief description of the items in these Bills of Quantities should in no way modify or supersede the detailed descriptions in the contract Drawings, conditions of contract and specifications.
- (ii) The unit of measurements and observations are as per those described in clause 1.0 5 of the section C.

(c) Summary

The summary contains tabulation of the separate parts of the Bills of Quantities carried forward with provisional sum, contingencies and any prime cost sums included. The Contract shall insert his totals and enter his grand total tender sum in the space provided below the summary.

This grand total tender sum shall be entered in the Form of Tender provided elsewhere in this document.

SPECIAL NOTES TO THE BILLS OF QUANTITIES

1. The Bills of Quantities form part of the contract documents and are to be read in conjunction with the contract drawings and general specifications of materials and works.
2. The prices quoted shall be deemed to include for all obligations under the sub-contract including but not limited to supply of materials, labour, delivery to site, storage on site, installation, testing, commissioning and all taxes (including **16% V.A.T, 3 % Withholding tax and all other taxes applicable at the time of tender**).
3. All prices omitted from any item, section or part of the Bills of Quantities shall be deemed to have been included to another item, section or part.
4. The brief descriptions of the items given in the Bills of Quantities are for the purpose of establishing a standard to which the sub-contractor shall adhere to. Otherwise alternative brands of **equal and approved** quality will be accepted.

Should the sub-contractor install any material not specified here-in before receiving **approval** from the Project Manager, the sub-contractor shall remove the material in question and, **at his own cost**, install the proper material.

5. The grand total of prices in the price summary page must be carried forward to the **MAIN Summary Page**.
6. Tenderers must enclose, together with their submitted tenders, detailed coloured manufacturer's Brochures detailing Technical Literature and specifications on all the equipment they intend to offer e.g. Standby Battery and UPS, Data Switches, Routers and IP-PBX.

The brochures are to be used to ascertain the suitability of the components offered by the bidders. Bidders not complying with this requirement shall be considered technically non-responsive and shall subsequently be disqualified.

BILL No. 1 - IP CCTV SYSTEM INSTALLATION WORKS

Schedule No. 1: - IP CCTV SYSTEM & ACCESS CONTROL INFRASTRUCTURE

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
<p>1.00</p>	<p>Supply, Install, Program, Test and Commission the following :-</p> <p>IP-CCTV SURVEILLANCE SYSTEM CAMERAS</p>				
1.10	5Megapixel resolution Network IR INDOOR Dome Day & Night Camera; as specified in the technical specifications.	2	No.		
1.20	5Megapixel resolution Vandal-Resistant Network Dome Camera; as specified in the technical specifications.	4	No.		
1.30	5Megapixel resolution Weatherproof Network IR OUTDOOR BULLET built-in IR LEDs Camera; as specified in the technical specifications.	2	No.		
2.00	POWER SUPPLY				
2.10	Power Distribution Units (PDU) 6/8 way Surge Protected /Triplite Voltage Regulator	2	No.		
3.00	BACKBONE CABLING AND GENERAL REQUIREMENTS				
3.10	Multi Mode Fiber Optic 8 Core Cable (Armoured) complete with connectors to Active Components and all terminations to active equipment i.e., Floor Edge Switch.	100	Lm.		
	Sub-total carried forward to the next page				

Item	Description	Unit	Qty	Rate (Kshs)	Cost (Kshs)
Sub-total carried forward from the previous page					
3.20	SFP Fibre Modules as CISCO or approved equivalent.	4	No.		
3.30	SC-SC fibre Patch Cord.	13	No.		
3.00	CABINETS				
3.10	42U Free standing equipment and server cabinet with lockable door, low noise (low Db) fans and power outlet sockets (Additional 6-Way power extension cable, surge protected within the cabinet).	1	No.		
3.20	Ditto but 22U cabinet.	0	No.		
3.30	12 Port Fiber Optic Patch Panel as Siemon or its equal and approved equivalent.	1	No.		
3.40	48 Port UTP Patch Panel as Siemon or its equal and approved equivalent C/W all the necessary accessories.	1	No.		
3.50	240V, 50Hz, 2.2KVA, Rack Mountable Double Conversion APC smart un-interrupted power supply unit (UPS) TRUE online INCLUDING Batteries with USB and Serial Port or an approved equivalent.	1	No.		
3.70	100mm x 50mm deep Deep Perfotrated GI cable tray complete with mounting brackets and all other necessary accessories to the approval of the Engineer.	100	Lm.		
Sub-total carried forward to the next page					

Item	Description	Unit	Qty	Rate (Kshs)	Cost (Kshs)
Sub-total carried forward from the previous page					
3.80	Grounding and bounding kit complete with 50mm diameter copper bounding bar and 6mm thick green and yellow wire complete with cable lugs and any other necessary accessories. The Earthing of the system is to be to the approval of the Electrical Engineer.	1	Lot		
4.00	CABLING				
4.01	Cat 6A, UTP 4 Pair cable as Siemon or its equal and approved equivalent.	800	Lm.		
4.02	1M, Cat 6A, UTP factory terminated Patch Cords as Siemon or its equal and approved equivalent.	24	No.		
4.03	Cat 6A, UTP Cable Manager (Organizer) as Siemon or its equal and approved equivalent C/W all the necessary accessories.	2	No.		
4.04	32mm Flexible Conduits in metres	10	Lm.		
4.05	20mm Flexible Conduits in metres	10	Lm.		
4.06	Cable Ties.	1	Item		
Sub-total for IP-CCTV Installation Work's c/f					
Price Summary Page					

Schedule No. 2: - SERVER SYSTEM & STORAGE

Item	Description	Unit	Qty	Rate (Kshs)	Cost (Kshs)
1.0	32CH Network Video Recorder (NVR); as specified in the technical specifications.	1	No.		
2.0	4TB Surveillance SATA HDD Suitable for the NVR above	16	No.		
3.0	Storage server for 1No. (One) year archiving as described in particular specifications	1	Item		
4.0	Server / Monitoring Client Station, intel 7 corei7, 64-bit, 16GB RAM, 8GB Video Graphics Card, 4TB HDD, Optical DVD DRIVE, Multi-Monitor Support.	1	No.		
5.0	IP Video Surveillance Management Software as described in particular specification	1	Item		
6.0	40” TV Monitor, as described in particular specifications	2	No.		
7.0	Provide for fiber cable testing, preparing and presenting warranty and documentation, cabling layout diagrams, indelible point labels and preparing and submitting individual test results (for each point and for all point to be submitted as a bound report). Attach printed results and soft copy	1	Lot		
3.0	Video Wall Controller as described in particular specifications	1	Item		
8.0	<p>Any other Item necessary for successful completion of this installation. (Please Itemize)</p> <p>a)</p> <p>b)</p> <p>c)</p>				
<p>Sub-total for Server System & Storage Installation Work's c/f Price Summary Page</p>					

BILL No. 2: NETWORKED ACCESS CONTROL SYSTEM

Item	Description	Unit	Qty	Rate (Kshs)	Cost (Kshs)
	Supply, install, test and commission the following				
6.01	Door input controller interface unit with twenty input and two output as described in particular specifications	1	No.		
6.02	Two door controller as specified in particular specifications	3	No.		
6.03	A 300Kg- Force magnetic door lock c/w Door Closer, Mounting Bracket and all other necessary accessories	3	No.		
6.04	Door Reader with biometric (Finger), PIN and proximity card reader complete with keypad and USB port as specified in particular specifications	3	No.		
6.05	Biometric Clocking as specified in particular specifications	1	No.		
6.06	Emergency Break glass	3	No.		
6.07	Override Key Switch	3	No.		
6.08	10A, moulded ivory white, retractable, sturdy switch plates as MK Range or approved equivalent	1	No.		
6.09	Exit slave door reader with biometric and proximity card capabilities	3	No.		
6.10	Category 6A, 4Pair, STP Cable and as Siemon 9A6LA-A5/USA or Approved Equivalent	300	M		
6.11	Access control door Power supply module complete with batteries as specified in particular specifications	1	No.		
6.12	Proximity card with the individual employee's name as specified in particular specifications	100	No.		
	Sub-total carried forward to the next page				

Item	Description	Unit	Qty	Rate (Kshs)	Cost (Kshs)
Sub-total carried forward from the previous page					
6.13	EBI software including Tema Module	1	No.		
6.14	Allow for software module for Access control system	1	Item		
6.13	Access control server controller as specified in particular specifications	1	No.		
6.14	Wire the entire access control system using 12 core 2.5mm ² fire resistant cable.	300	M		
6.15	10KVA rack mounted UPS power supply as specified in particular specifications	1	No.		
6.16	Allow for full graphic customization and programming of the installed system.	1	Lot		
6.17	Any other items necessary to complete the above installation as per the system you propose to install. Please list the items and price a) b) c)	1	Lot		
Sub-total for Access Control System Installation					
Work's c/f Price Summary Page					

MAIN SUMMARY PAGE

Item	Description	Amount (Kshs)
A	Sub-total for Bill No. 1 Schedule No. 1: IP CCTV SYSTEM & ACCESS CONTROL INFRASTRUCTURE b/f from Page .. F-5	
B	Sub-total for BILL No. 2 SCHEDULE No. 1: SERVER SYSTEM & STORAGE b/f from Page .. F-6	
C	Sub-total for BILL No. 3: NETWORKED ACCESS CONTROL SYSTEM b/f from PageF-8	
D	Allow for preparing CCTV System cabling layout diagrams to	
E	Allow for labelling the CCTV System cabling to engineer's approval	
F	Allow for testing, compilation and submission of test results report for all the CCTV point (to attach printed and soft copies of test results)	
G	Allow for training of 2No. technical staff from Public Works Directorate and 4No. Clients staff on usage and operation of the	
H	Allow a Provisional Sum of Kshs. 500,000/- for contingency sum to be	
I	Total for CCTV & Access Control Installation Works c/f to Grand Summary Page	

SECTION G
TECHNICAL SCHEDULE
OF
ITEMS TO BE SUPPLIED

TECHNICAL SCHEDULE

1. The technical schedule shall be submitted by tenderers to facilitate and enable the Project Manager to evaluate the tenders, especially where the tenderer intends to supply or has based his tender sum on equipment which differs in manufacture, type or performance from the specifications indicated by the Project Manager.
2. The filling of this schedule forms part of Technical Evaluation of the tenders, and bidders shall therefore be required to indicate the type/make and country of origin of all the materials and equipment they intend to offer to the employer in this schedule.
3. Any bid returned with unfilled Technical Schedule shall be considered technically non-responsive, and the bidder shall automatically be disqualified.

TECHNICAL SCHEDULE OF ITEMS TO BE SUPPLIED

(To be completed by the Tenderer as a Mandatory Requirement)

ITEM	DESCRIPTION	TYPE/MAKE/CATALOGUE No.	COUNTRY OF ORIGIN
1.0	Patch panels/patch cords		
2.0	Network Video Recorder		
3.0	CAT 6A cables		
4.0	Door controller		
5.0	Fiber Cable		
6.0	Cameras a) Dome b) Mini-dome/fisheye c) PTZ d) Bullet e) Box		
7.0	Network Video Recorder		
8.0	LED panel display		
9.0	Workstation		
10.0	UPS		
11.0	Access Control Proximity Card Readers		
12.0	Proximity Card		
13.0	Magnetic Door Lock		

SECTION H

STANDARD FORMS

CONTENTS OF SECTION H

	<u>TITLE</u>	<u>PAGE</u>
1.	Key Personnel	H/1
6.	Schedule of Contracts completed in the last five (5) years	H/2
7.	Schedule of on-going projects	H/3
8.	Contractor's Equipment	H/4
9.	Details of Litigation or Arbitration Proceedings	H/5

NOTE:

1. Tenderers must duly fill these Standard Forms as a mandatory requirement as they will form part the evaluation criteria.
2. Any tender returned with **unfilled Standard Forms** shall be considered **non-Responsive and shall automatically be disqualified.**

KEY PERSONNEL

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

POSITION	NAME	HIGHEST QUALIFICATION <i>(Attach proof)</i>	YEARS OF EXPERIENCE (GENERAL)	YEARS OF EXPERIENCE IN PROPOSED POSITION
1.				
2.				
3.				
4.				
5.				
6.				
7.				

I certify that the above information is correct.

.....

Title

.....

Signature

.....

Date

CONTRACTS COMPLETED IN THE LAST FIVE (5) YEARS

Work performed on works of a similar nature, complexity and volume over the last 5 years.

<i>PROJECT NAME</i>	<i>NAME OF CLIENT</i>	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.

.....

.....

.....

Title

Signature

Date

SCHEDULE OF ON-GOING PROJECTS

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

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

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

.....

Title

.....

Signature

.....

Date

**SCHEDULE OF MAJOR ITEMS OF CONTRACTOR'S EQUIPMENT PROPOSED FOR
CARRYING OUT THE WORKS**

ITEM EQUIPMENT	OF	DESCRIPTION, MAKE AND AGE (Years)	CONDITION (New, good, poor) and number available	OWNED, LEASED (From whom?), or to be purchased (From whom?)

DETAILS OF LITIGATION OR ARBITRATION PROCEEDINGS IN WHICH THE TENDERER HAS BEEN INVOLVED AS ONE OF THE PARTIES IN THE LAST 5 YEARS

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