

VOLUME 4 of 6

STRUCTURED CABLING WORKS

**[2NO. 2,500MM² INDUSTRIAL SHEDS ~
KENANIE INDUSTRIAL PARK]**



REPUBLIC OF KENYA

**MINISTRY OF
AGRICULTURE, LIVESTOCK, FISHERIES AND
COOPERATIVES
KENYA LEATHER DEVELOPMENT COUNCIL (KLDC)**

PROPOSED CONSTRUCTION OF 2NO. INDUSTRIAL WAREHOUSES, EACH
2500SM, FOR LEATHER PRODUCTS MANUFACTURE AT KENYA LEATHER
PARK, KENANIE EPZ SITE, MACHAKOS COUNTY

W.P. ITEM NO. D117 EN/MKS/1902 JOB NO. 10753A

**TENDER SPECIFICATIONS & BILLS OF QUANTITIES FOR
SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF STRUCTURED CABLING WORKS**

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SECTION A

INSTRUCTIONS TO TENDERERS

PRELIMINARY & TECHNICAL EVALUATION CRITERIA

INSTRUCTIONS TO TENDERERS

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TENDER EVALUATION CRITERIA

After tender opening, the tenders will be evaluated in **2 stages**, namely:

1. Preliminary Evaluation;
2. Technical Evaluation;

STAGE 1: PRELIMINARY EVALUATION

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

These conditions shall include the following:

- i) Company Certificate of Incorporation/Registration;
- ii) Current category of Registration with National Construction Authority (NCA 5 and above in Structured Cabling Installations);
- iii) Current National Construction Authority's Contractor's Annual Practicing License
- iv) Current Class of Licenses with Communication Authority of Kenya (CA)
- v) Valid Tax Compliance Certificate
- vi) Manufacturer's Authorization Letter for Network Switch any other Network Item being offered by the bidder
- vii) Compliance with Technical Specifications

Note:

On compliance with Technical Specifications, bidders shall supply equipment/items which comply with the technical specifications set out in the bid document. In this regard, the bidder will be required to submit relevant technical brochure/catalogues with the tender document, highlighting (using a mark-pen or highlighter) the Catalogue Number/model of the proposed items. Such brochures/ catalogues should indicate comprehensive relevant data of the proposed equipment/items which should include but not limited to the following:

- (i) Standards of manufacture;*
- (ii) Performance ratings/characteristics;*
- (iii) Material of manufacture;*
- (iv) Electrical power ratings; and*
- (v) All other requirements as indicated in the technical specifications of the bid.*

The bids will then be analyzed, using the information in the technical brochures, to determine compliance with technical specifications for the works/items as indicated in the tender document. Bidders not complying with **any** of the technical specifications shall be adjudged technically non-responsive while those meeting all technical specifications shall be considered technically responsive.

The tenderer shall also fill in the Technical Schedule as specified in the tender document for Equipment and Items indicating the Country of Origin, Model/Make/Manufacturer and catalogue numbers of the Items/Equipments they propose to supply.

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

STAGE 2: TECHNICAL EVALUATION

In order to be compliant, the Tenderers shall be required;

- a) *To fill the Standard Forms* provided in the bid document for the purposes of providing the required information. The tenderers may also attach the required information if they so desire;

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

<u>PARAMETER</u>	<u>MAXIMUM POINTS</u>
(i) Key personnel.....	12
(ii) Contract Completed in the last Five (5) years.....	9
(iii) Schedules of on-going projects.....	4
(iv) Schedules of Contractor's equipment.....	12
(v) Litigation History.....	2
TOTAL	<u>39</u>

The pass-mark under the Technical Evaluation is **28 points**.

The detailed scoring plan shall be as shown in table 1.

TABLE 1: Assessment for Eligibility

Item	Description	Points Scored	Max. Point	
1.	Key Personnel (Attach evidence)			
	Director of the firm		4	12
	<ul style="list-style-type: none"> • Holder of degree in relevant Engineering field----- 4 • Holder of diploma in relevant Engineering field----- 3 • Holder of certificate in relevant Engineering field----- 2 • Holder of trade test certificate in relevant Engineering field----- 1 • No relevant certificate----- 0 			
	At least 1No. degree/diploma holder of key personnel in relevant field		4	
	<ul style="list-style-type: none"> • With over 10 years of relevant experience----- 4 • With over 5 years of relevant experience----- 2 • With under 5 years of relevant experience ----- 1 			
At least 1No certificate holder of key personnel in relevant field		2		
<ul style="list-style-type: none"> • With over 10 years of relevant experience----- 2 • With over 5 years of relevant experience ----- 1 • With under 5 years of relevant experience ----- 0.5 				
	At least 2No artisan (trade test certificate in relevant field)		2	
	<ul style="list-style-type: none"> • Artisan with over 10 years of relevant experience----- 2 • Artisan with under 10 years of relevant experience ----- 1 • Non skilled worker with over 10 years of relevant experience--0 			
2.	Contracts completed in the last five (5) years (Max of 3No. Projects) - Provide Evidence		9	
	<ul style="list-style-type: none"> • Project of similar nature, complexity or magnitude----- 3 • Project of similar nature but of lower value than the one in consideration----- 2 • No completed project of similar nature----- 0 			
3.	On-going projects – Provide Evidence		4	
	<ul style="list-style-type: none"> • No Project of similar nature, complexity and magnitude ----- 4 • Three and below Projects of similar, nature complexity and magnitude -----3 • Four and above Projects of similar nature, complexity and magnitude ----- 2 			
4.	Schedule of contractors equipment and transport (proof or evidence of ownership/Lease)			
	a) Relevant Transport (at least 3No. each 2mks)		6	12
	<ul style="list-style-type: none"> • Means of transport (Vehicle)-----6 • No means of transport-----0 			
b) Relevant Equipment (at least 6No. each 1mks)		6		
<ul style="list-style-type: none"> • Has relevant equipment for work being tendered-----6 • No relevant equipment for work being tendered-----0 				

Item	Description	Points Scored	Max. Point
5.	Litigation History <ul style="list-style-type: none"> • Duly Filled ----- 2 • Not filled ----- 0 		2
	TOTAL		39

Any bidder who scores 28 Points and above shall be considered for further evaluation.

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

This specification is to be read in conjunction with the drawings which are issued with it. Bills of quantities shall be the basis of all additions and omissions during the progress of the works.

2. STANDARD OF MATERIALS

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

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

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

3. WORKMANSHIP

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

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

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

4. PROCUREMENT OF MATERIALS

The sub-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.

Sub-contractors are warned that they must make their own arrangements for the supply of materials and/or products specified or required.

5. RECORD DRAWINGS

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

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

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

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

6. REGULATIONS AND STANDARDS

All work executed by the Sub-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)

Where the two sets of regulations appear to conflict, they shall be clarified with the Engineers. All materials used shall comply with relevant Kenya Bureau of Standards Specification.

7. SETTING OUT WORK

The sub-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

The Sub-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 Specification No. 1 and No.2, Electric Supply Company's By-Laws, Communications Authority of Kenya (CA) requirements or any other supplementary Regulations as may be produced by the engineer.

- (a) Any faults, defects or omissions or faulty workmanship, incorrectly positioned or installed parts of the installation made apparently by such inspections or tests shall be rectified by the Sub-contractor at his own expense.
- (b) The Sub-contractor shall provide accurate instruments and apparatus and all labour required to carry out the above tests. The instruments and apparatus shall be made available to the services engineer to enable him to carry out such tests as he may require.

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, Public Works, Housing & Urban Development, State Department of Public Works**, at Chief Engineer's (Electrical) office, 5th Floor 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 sub-contractor.

SECTION D
PARTICULAR SPECIFICATIONS
OF
MATERIALS AND WORKS

PARTICULAR AND TECHNICAL SPECIFICATIONS FOR STRUCTURED CABLING SYSTEM

CLAUSE	DESCRIPTION
	PART 1
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 and Components
1.10	Working Drawings
1.11	Record Drawings
1.12	Tests
1.13	Quality Materials
1.14	Training
1.15	Equipment Guarantee
1.16	Patent Rights

PARTICULAR AND TECHNICAL SPECIFICATIONS FOR STRUCTURED CABLING WORKS

1.01 DESCRIPTION OF THE SITE

The site of the proposed works is located at **Kenanie EPZ Site, Machakos County.**

1.02 DESCRIPTION OF THE PROJECT

The works to be carried out comprise the following;

- i) Proposed supply, installation, testing and commissioning of a structured cabling system to cater for computer data points and telephone points.
- ii) Configure and set up the structured cabling system to be used on LAN,
- iii) Produce test result, warranty certification, reports and as installed drawings. The Network will be capable of supporting approximately 60 data/voice points.

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 Temperature:	23°c
Mean Minimum Temperature:	19.4°c
Range of Relative humidity:	65% - 73%
Salt in the atmosphere:	0.02%
Altitude:	1795 M above sea level
Latitude (approximately):	-1.2921° S
Longitude:	36.8219° E
Solar Radiation, February Mean:	Max 630 Langleys

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 (CA)
- 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 415/240VAC, 47-63Hz 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.

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 than one month afterwards.

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

1.12 TESTS

Both on completion of his work on the installation of the system and at the end of the guarantee period, the Contractor shall carry out such tests as may be required and in accordance with B.S 2655 part 7 in the presence of the Engineer 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.

Damage occurring, as a result of these tests will be made good by the Contractor to the Engineer’s satisfaction at his expense.

4No. (Four) copies of the test certificates for each equipment should be forwarded to the Engineer within 4 days of completion of the last test.

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

The Contractor shall provide in his tender for the training of 5No. Technicians on site in the maintenance of the Equipment during the installation, testing and commissioning period. The cost of this 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.

1.17 INITIAL MAINTANANCE OF THE STRUCTURED CABLING SYSTEM SYSTEMS EQUIPMENT

The tenderer shall allow in his tender for the initial routine service maintenance of the new installation once a month during the 12 months defects liability period and shall carry out all necessary adjustments and repairs, cleaning e.t.c.

During the initial maintenance of the installation, the tenderer shall also allow in his tender for all tools, instruments, plant and the transportation thereof, as required for the correct and full execution of these obligations and the provision, use or installation of all materials or parts which are periodically renewed or parts which are faulty for any reason whatsoever excepting always Acts of God such as storm, tempest, flood, earthquake and civil revolt, acts of war and vandalism.

The contractor shall also provide a 24 -hour break-down service to attend to faults on or malfunctioning of the installation between the routine visits of the defects liability period. A monthly report of any works done upon the installation shall be supplied to the Engineer.

PART 2

TECHNICAL SPECIFICATIONS FOR THE STRUCTURED CABLING SYSTEM

2.01 NETWORK CABINETS

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

2.02 ACTIVE CONTROL EQUIPMENTS 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 10-slots or higher chassis
- h. The core switches should have two links to each floor 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 floor to the core should be connected to 1000Base X(GBIC) port on the core switch.
- 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.

2.03 ACTIVE CONTROL EQUIPMENTS AT THE LAN EDGE

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 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 Equipments at the LAN Edge should be quoted with a minimum of **One year of warranty** covering free replacement of parts and units.

2.04 NETWORK MANAGEMENT SYSTEM

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

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

2.05 NETWORK CABINETS

DATA CABINET AND ACCESSORIES		
RACKS TECHNICAL SPECIFICATIONS		
Item	Minimum Specifications	Proposed Solution
Brand	State the brand, model and attach Technical Brochure (Mandatory)	
Product Description	Rack -ventilated -(42U, 22U, 18U,15U, 9U as per the BQ)	
Product type	Ventilated rack	
Rack sized	19"	
Dimensions	Minimum 600mm x 600mm to fit the active components	
Construction	<ul style="list-style-type: none"> ▪ The front Clear Glass door, back door mesh door. ▪ Front/rear locking double section door, enable ventilation and reliable operation. ▪ Wire path on the top and bottom can be closed. ▪ High grade knob and lock. ▪ Wire groove with Wide cable manager on the two sides. ▪ Detachable composite structure, more convenient for being shipped ▪ Material: SPCC quality cold rolled powder coated steel ▪ Color: (Silk Grey) ▪ Surface finish: degrease, acid pickling, rust prevention and Parkerizing, pure water cleaning, static electricity plastic painting 	
Power	<ul style="list-style-type: none"> ▪ Pre-wired 240V AC conditioned grounded power circuit ▪ 6 Outlet Power Distribution Unit Included ▪ Supplied with Earth Bond Kit and Cage nuts 	
Standards	Comply with ANSI/EIA RS-310-D, IEC297-2, DIN41494; PART1, DIN41494; PART7, GB/T3047; 2-92STANDARD	

2.06 CABLES

i) HORIZONTAL CABLING

Item	Category 6A UTP 4-Pair Cable	Proposed Solution
Brand	State the brand, model (Mandatory)	
Construction	<ul style="list-style-type: none"> • UTP • Nominal jacket OD: 8.5mm (0.33 in.) • 0.58mm (0.02 in.) solid (non-tinned) copper • Centre Isolation Member 	
Jacket	Sequential meter markings	
Wire characteristics	DC Resistance: <8.5 Ω/100m DC Resistance Unbalance: 2% Mutual Capacitance: 5.6 nF/100m Capacitance Unbalance: <160 pF/100m Characteristic Impedance(ohms): 1 - 250 MHz: 100 ± 15% 100 - 750 MHz: 100 ± 22% NVP: 67% TCL: 30-10 log (f/100)dB PSANEXT: 62.5-15log(f /100)dB PSAACR-F: 38.2-20log(f /100)dB Delay Skew: = 45ns	
Industry Compliance	<ul style="list-style-type: none"> ▪ ISO/IEC 11801 Ed. 2.2 (Class EA) ▪ ISO/IEC 61156-5 (Category 6A) ▪ TIA-568-C.2 (Category 6A) ▪ LSOH: ISO/IEC 60332, IEC 60754, IEC 61034 ▪ EN50399 Class Eca 	
Physical Properties	Pulling Tension (max): 110N (25 lbf) Bend Radius (min): 45.7mm (1.8 in.) Installation Temperature: 0 to 60°C (+32 to 140°F) Storage Temperature: -20 to 75°C (-4 to 167°F) Operating Temperature: -20 to 60°C (-4 to 140°F)	

ii) PATCH CORDS: Category 6A double-ended, stranded modular cord 1/2/3/5 Meter

Item	Floor Distribution In Cabinet and user work-station areas	Proposed Solution
	Minimum specifications	
Length	1 & 3 meters	
Brand	State the brand, model (Mandatory)	
Construction	MECHANICAL — PLUG Number of Plug Insertion Cycles: 2500 Min. Plug Retention Force: 50N (11.2 lbf) Plug Compatibility: Compatible with RJ45 Cable to Plug Tensile Strength (min.) 20 lbs.	
Jacket	Factory made	

Item	Floor Distribution In Cabinet and user work-station areas	Proposed Solution
Wire characteristics	<p>MECHANICAL — CABLE (STRANDED) Wire Size Range (Nominal): 26 AWG 7x32 Stranded tinned copper Cable Construction: UTP dual jacketed Cable O.D. (nominal) 7.37mm (0.29 in.) outer, 6.43mm (0.25 in.) inner Wiring:T568A/B Jacket Type: CMG Bend Radius: 25mm (1.0 in.) 4-pair cables with 100-ohm impedance. Compliant to standards such as TIA/EIA – 268-B. 2-1 and IEC 61156-Made of polyethylene insulation Pulling force should support up to 50N/mm2 Low Smoke Zero Halogen outer sheath.</p> <p>MECHANICAL — CABLE (SOLID) Wire Size Range (Nominal): 23 AWG Solid bare copper Cable Construction: UTP Cable O.D. (nominal): 7.87mm (0.31 in.) Wiring: T568A/T568B Jacket Type: LSOH Bend Radius: 25mm (1.0 in.)</p>	
Performance Specifications	<p>ELECTRICAL Contact Resistance 10 mΩ Input to Output Resistance 200 mΩ Min. Dielectric Withstand Voltage (contact to contact)- 1000 V DC or AC peak Insulation Resistance - 500 mΩ Compatibility Backwards to Cat 6 Current Rating @ 25° C 1.5 A Power over Ethernet Suitable for PoE Type1,2,3,4 and PoH Power over Ethernet < 10 mΩ/m @ 10 MHz</p> <p>MECHANICAL — GENERAL Operating Temperature -10 to 60° C, (14 to 140° F) Flammability Rating UL 94 V-0 Green Features RoHS, lead-free, halogen-free, PVC free Plug Housing Materials Polycarbonate Contact Materials 50 microinches gold plating or equivalent Plastic Materials Flame retardant themoplastic Screen 360 degree enclosure Marking P/N, length, performance level, QC</p>	
Standards	<p>STANDARDS COMPLIANCE</p> <ul style="list-style-type: none"> • ANSI/TIA-568.2-D • ISO/IEC 11801-1 Ed 1.0 • IEEE 802.3an (10Gbase-T) • IEEE 802.3af (Type 1 PoE) • IEEE 802.3at (Type 2 PoE) • IEEE 802.3bt (Type 3 PoE) • IEEE 802.3bt (Type 4 PoE) • Power over HDBaseT (PoH) • IEC 60603-7 • IEC 60603-7-4 • UL Listed 1863 • IEC 60332-1 (LSOH) • IEC 60754 (LSOH) • IEC 61034 (LSOH) • ANSI/TIA-1096-A 	

iii) CAT 6A UTP PATCH PANELS

Item	Minimum specifications	Proposed Solution
Brand	State the brand, model and attach Technical Brochure (Mandatory)	
Ports	24/48 Ports	
Characteristics	Operating Temperature: -10 to 60 °C, (14 to 140 °F) Flammability Rating: UL 94 V-0 Green Features: RoHS, lead-free, halogen-free, PVC free Plastic Materials Flame retardant themoplastic Dimensions (LxWxH):109.2 mmx 482.6mm x 44.2mm (4.30"x19.00" x1.74 ") Mounting: CEA-310-E 19-inch (482.6mm) rack Material – Panel: 18 gauge cold rolled steel, black e-coat Ground Lug Attachment: 3/8" 1 hole or two-hole lug (1" spacing	
Industry Compliance	STANDARDS COMPLIANCE <ul style="list-style-type: none"> • ANSI/TIA-568-C.2 • ISO/IEC 11801 Ed 2.2 • ETL Tested • IEC 60603-7 • IEC 60603-7-51 • IEEE 802.3an • IEEE 802.3af (PoE) • IEEE 802.3at (PoE+) • ANSI/TIA-1096-A 	
Warranty	End-to-End Manufacturer's Warranty on Cabling System (Attach Manufacturer's Warranty Statement) Minimum 5 Years	

iv) FACE PLATES - COMPLETE WITH TWIN SCREENED MAX MODULES

Item	Minimum	Proposed Solution
Brand	Specifications State the brand, model	
Construction	<ul style="list-style-type: none"> ▪ Complete with screen Twin MAX RJ45 Modules ▪ Double gang faceplates for each designated work area point. ▪ UV resistant, high impact plastic preventing color fading and provides added durability 	
Wiring	T568A and T568B	
Face Plate Characteristics	<ul style="list-style-type: none"> ▪ Twin ▪ Label Covers- Faceplates include pressure-release designation label covers for quick, tool-less removal ▪ With icon/label provision 	
	<ul style="list-style-type: none"> ▪ With doors/shutters ▪ British Standard (85mm x 85mm) ▪ White 	
Module Characteristics	100/100/10Gbs Backward compatible	

Item	Minimum Specifications	Proposed Solution
	Max DC Resistance: 9.4ohms/100m 100-250Mhz: 100ohms±22% 1-100Mhz : 100ohms±15% NVP: 0.65	
Industry Compliance	<ul style="list-style-type: none"> ▪ ISO/IEC 11801: 2002 2nd Edition(Category 6) ▪ ANSI/TIA/IEC 754 and IEC 1034 ▪ IEC 61156-5 1st Edition 	
	<ul style="list-style-type: none"> ▪ LSOH :IEC 754 and IEC 1034 ▪ UL CMX ▪ UL CMP and CSA FT6 	
Warranty	End-to-End Manufacturer's Warranty on Cabling System(Attach Manufacturer's Warranty Statement) Minimum 5 Years	

2.07 FIBRE

i) BACKBONE MULTIMODE FIBRE OPTIC CABLE

Item	Minimum Specifications	Proposed Solution
Brand	State the brand, model (Mandatory)	
Construction	Steel Tape armoured with Glass Yarn	
Armour	Corrugated Steel Tape Armour	
Cable characteristics	<ul style="list-style-type: none"> ▪ Support for 10GBASE-T ▪ Low Density Polyethylene Sheath ▪ Gel Filled Loose Buffer Tube ▪ Level 1 Rodent Protection ▪ Crash(N) at least 2500 ▪ Torsion (Turns/M) not more than 5 ▪ Multimode 	
Fibre Specifications	<ul style="list-style-type: none"> ▪ 8-Core indoor Premium fiber meeting IEEE 802.3 10 Gigabit Ethernet Standard as well as IEC-60793-2-10 and TIA-492AAAC specifications for laser bandwidth Differential Mode Delay(DMD) specifications 	
	<ul style="list-style-type: none"> ▪ 900 μm tight buffer ▪ 250μm coated optical fibre ▪ Length markings in 2 ft. increments ▪ Available in OFNR, OFNP and LSOH constructions ▪ jacket Material is Lead Free ▪ RoHS compliant 	
Industry Compliance	<ul style="list-style-type: none"> ▪ ISO/IEC 11801:2002 OM3 	
	<ul style="list-style-type: none"> ▪ ANSI/TIA/EIA-568-B.3 ▪ ANSI/TIA/EIA-568-B.3-1 	
SCW-D/12		

Item	Minimum Specifications	Proposed Solution
	<ul style="list-style-type: none"> ▪ ANSI/TIA-598-C ▪ Telcordia GR-409-CORE ▪ LSOH: IEC 60332-1, IEC 61034, IEC 60754 ▪ OFNR: Communications Type OFNR(UL) and FT4 c(UL) ▪ TIA-492AAAC laser bandwidth DMD specification 	
	<ul style="list-style-type: none"> ▪ IEC 60793-2-49 and TIA/EIA 455-220 DMD measurement test procedure 	

ii) BACKBONE FIBRE CABLING INTERCONNECT

Rack Mount Interconnect Center (RIC)		
Item	Minimum Specifications	Proposed Solution
Brand	State the brand, model and attach Technical Brochure (Mandatory)	
Construction	<ul style="list-style-type: none"> ▪ Quick-Release Hinges- -Spring loaded quick-release hinges ▪ Rotating Grommets 	
	<ul style="list-style-type: none"> ▪ Complete Access-Management tray has a positive stop in both front and rear working positions providing complete access for moving, adding, changing or cleaning of fiber connections 	
	<ul style="list-style-type: none"> ▪ Maximum capacity- enable a maximum amount of fibers to be patched or patched and spliced in a 2,3 and 4 RMS enclosure without compromising the accessibility. ▪ include laser-printable labels, cable ties, rack mounting hardware 	
Industry Compliance	<ul style="list-style-type: none"> ▪ Meets or exceeds IEEE802.3ae standard ▪ EMC/EMI Specifications 	

iii) BACKBONE FIBRE CONNECT PANELS

Fibre connect panels		
Item	Minimum Specifications	Proposed Solution
Brand	State the brand, model	
Construction	<ul style="list-style-type: none"> ▪ Lanced Tabs- Provide convenient cable anchor points for incoming jacketed fiber cable ▪ Front Fiber Clips-Manage up to 36 duplex fiber jumpers (72 fibers total) 	
	<ul style="list-style-type: none"> ▪ Label Holder-Protects fiber jumpers and is readily removable via release of factory installed snap latches ▪ Splice Trays 	
	<ul style="list-style-type: none"> ▪ Rear Fiber Clips- to Manage cable slack while maintaining minimum bend radius requirements 	
Industry Compliance	<ul style="list-style-type: none"> ▪ Meets or exceeds IEEE802.3ae standard ▪ EMC/EMI Specifications 	

iv) BACKBONE DISTRIBUTION FIBRE PATCH CORDS

Item	Minimum Specifications	Proposed Solution
Brand	State the brand, model	
Construction	precision cable assembly with warranted for 20 years	
	<ul style="list-style-type: none"> ▪ Support for 10 Gigabit Ethernet serial transmission when installed in a qualified system. SC,LC and SC-LC hybrids. ▪ Connectors color coded per ANSI/TIA/EIA-568-B.3 ▪ Dust Caps- Dust caps included to protect polished ferrule from dirt and damage 	
	<ul style="list-style-type: none"> ▪ Polarity Connection- SC Duplexing clip for polarity correction 	
Industry Compliance	<ul style="list-style-type: none"> ▪ Meets or exceeds IEEE802.3ae standard ▪ Meet or Exceeds TIA/EIA and ISO/IEC requirements for aging, exposure to humidity, temperature extremes, impact, vibration, coupling strength, and cable resistance to stress and strain. 	
	<ul style="list-style-type: none"> ▪ EMC/EMI Specifications 	

2.08 ACTIVE DEVICES

i) EDGE SWITCH (48 port/24 port)

Item	Minimum Specifications	Proposed solution
Brand	State the brand, model and attach Technical Brochure (Mandatory) – The Switch should currently be supported by the Manufacturer and not less than 5 years to end of life.	
Features	<ul style="list-style-type: none"> ▪ Full Power over Ethernet Plus (PoE+) capability ▪ Downlinks total 10/100/1000 or PoE+ copper ports: 24 ports data ▪ Uplink configuration: Modular uplink options (4 No. 10G SFP+ Stacking) ▪ Default primary AC power supply: 240VAC ▪ Fans: FRU redundant ▪ Operational efficiency with optional backplane stacking, supporting stacking bandwidth up to 160 Gbps ▪ UADP 2.0 Mini with integrated CPU ▪ AES-128 MACsec encryption ▪ Layer 3 capabilities, including OSPF, EIGRP, ISIS, RIP, and routed access ▪ Advanced network monitoring using Full Flexible NetFlow ▪ Plug and Play (PnP) enabled 	
Specs	<ul style="list-style-type: none"> ▪ Virtual Networks: 4 ▪ Stacking bandwidth: >150 Gbps ▪ Default AC power supply AC 240V ▪ Stacking Bandwidth Support: >300 Gbps ▪ Switching capacity:> 150 Gbps ▪ Forwarding rate: >200 Mpps ▪ Total number of MAC addresses: >30000 ▪ Total number of IPv4 routes (ARP plus learned routes) :> 14,000 ▪ Packet buffer per SKU: >5 MB Buffer ▪ Mean time between failures (hours) - >500,440 	
RAM & accessories	<ul style="list-style-type: none"> ▪ DRAM- >=4GB ▪ Flash->= 4GB 	
Support	Locally Available Technical Support Services(Manufacturer's Letter of Authorization Mandatory)	
Warranty	Manufacturer's Limited Lifetime Warranty	

ii) WIRELESS ACCESS POINT

Item	Minimum Specifications	Proposed Solution
Brand	State the brand, model and attach Technical Brochure (Mandatory) - The ACCESS POINT should currently be supported by the Manufacturer and not less than 5 year to end of life.	
Features	<ul style="list-style-type: none"> ▪ Ports: LAN Gigabit Ethernet auto sensing ▪ Cabling type: Category 6e or better ▪ Antennas: Internal antennas optimized for installation on a wall or ceiling ▪ LED indicators: Power, WLAN, LAN ▪ Operating system: Linux <p>Physical Interfaces</p> <ul style="list-style-type: none"> ▪ Ports: 10/100/1000 Ethernet, with support for 802.3af PoE ▪ Buttons: Reset button ▪ LEDs: Power, Wireless, Ethernet <p>Physical Specifications</p> <p>Network Capabilities</p> <ul style="list-style-type: none"> ▪ VLAN support: Yes ▪ Number of VLANs: 1 management VLAN plus 16 VLANs for SSIDs ▪ 802.1X supplicant: Yes ▪ SSID-to-VLAN mapping: Yes ▪ Auto channel selection: Yes ▪ Spanning tree: Yes ▪ Load balancing: Yes ▪ IPv6: Yes ▪ IPv6 host support ▪ IPv6 RADIUS, syslog, Network Time Protocol (NTP), etc. ▪ Layer 2 802.1Q-based VLANs, 16 active VLANs plus 1 management VLAN 	
Performance	<ul style="list-style-type: none"> ▪ Wireless throughput Up to 450 Mbps data rate (real-world throughput will vary) ▪ Recommended user support 64 or higher connective users, Multiple-Access Point Management ▪ Single Point Setup: Yes ▪ Number of access points per cluster: >8 ▪ Active clients per cluster: >200 	
Wireless	<ul style="list-style-type: none"> ▪ Frequency: WAP551: Selectable radio band ▪ WLAN: 802.11b/g/n 802.11 dynamic frequency selection (DFS) ▪ Data rates supported 802.11a/b/g: 54, 48, 36, 24, 18, 12, 9, 6, 11, 5.5, 2, and 1 Mbps <p>802.11n:</p> <ul style="list-style-type: none"> ✓ 20-MHz bandwidth: MCS 0-15 for supported data rates ✓ 40-MHz bandwidth: MCS 0-15 for supported data rates 	
Standards	<p><u>Standards Compliance</u></p> <p>IEEE 802.11n, 802.11g, 802.11b, 802.3af, 802.3u, 802.1X (security authentication), 802.1Q (VLAN), 802.1D (Spanning Tree), 802.11i (WPA2 security), 802.11e (wireless QoS), IPv4 (RFC 791), IPv6 (RFC 2460)</p>	

Item	Minimum Specifications	Proposed Solution
Security	<ul style="list-style-type: none"> ▪ WPA/WPA2: Yes, ▪ Access control Yes, management access control list (ACL) plus MAC ACL ▪ Secure management HTTPS ▪ Wi-Fi Protected Setup (WPS) Yes (soft WPS, no hardware push button) ▪ SSID broadcast: Yes ▪ Rogue access point detection: Yes 	
Mounting	<ul style="list-style-type: none"> ▪ Multiple mounting options Mounting bracket included for easy ceiling or wall mounting ▪ Physical security lock 	
Management	<ul style="list-style-type: none"> ▪ Management protocols Web browser, Simple Network Management Protocol (SNMP) ▪ Remote management: Yes ▪ Event logging Local, remote syslog, email alerts ▪ Network diagnostics Logging and packet capture ▪ Web firmware upgrade: Firmware upgradable through web browser, imported/exported configuration file ▪ Dynamic Host Configuration Protocol (DHCP) client: Yes ▪ IPv6 host: Yes ▪ HTTP redirect: Yes 	
Support	Locally Available Technical Support Services (Manufacturer's Letter of Authorization Mandatory)	
Warranty	Manufacturer's Limited Lifetime Warranty	

2.09 COMPLETION COMMISSIONING OF STRUCTURED CABLING WORKS

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

a) **Category 6 Cable Tests**

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

b) **Fibre Optic Cable Tests**

1. Link attenuation (insertion loss)
2. Length

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

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

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

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

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

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

2.10 Documentation

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

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

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

2.11 Warranty and Support

2.11.1 The Contractor will be required to give a per link warranty of at least fifteen (15) years for the structured cabling infrastructure and must provide a site certification certificate from the manufacturer of the cabling infrastructure not more than 30 days after completion of tests.

2.11.2 In the event of failure of the core switch, the contractor will be required to deliver any necessary parts on the next business day after determining that parts replacement is required, during the standard work week (8 hours a day, 5 days a week). This support will be carried out by a field engineer and will run for a period of Twenty Four months from the date of commissioning of the LAN.

2.11.3 The contractor will be required to provide a sixty months warranty on the edge switches from the date of commissioning of the LAN.

2.12 ADDITIONAL NOTES

Tenderers should take note of the following

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

2.13 BROCHURES AND TECHNICAL LITERATURE

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

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

2.14. TECHNICAL SPECIFICATION FOR COMPUTER AND ACCESSORIES

2.14.1) SPECIFICATIONS FOR DESKTOP COMPUTERS

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	BIDDER'S SPECIFICATIONS
A	GENERAL SPECIFICATIONS		
1	Make	BRANDED	
2	Model	HP EliteDesk 800 G1 Desktop	
3	Country of Origin		
4	Manufacturer's brochure and specifications	Must be supplied	
B	TECHNICAL SPECIFICATIONS		
5	Processor	Intel® Core™ i7-4790 with Intel HD Graphics 4600 (3.6 GHz, 8 MB cache, 4 cores)	
6	System Memory	16 GB 1600 MHz DDR3 SDRAM (1 x 4 GB)	
7	Disk cache	Integrated 8MB L2 cache Bus Speed 2700 MHz	
8	Storage sub system	1 TB 7200 rpm SATA SSD	
9		DVD / CD-Writer Drive Memory Card Reader	
10	Display/Graphics	21" TFT Screen (Free standing-Adjustable)	
11	Keyboard	PS/2 Enhanced keyboard	
12	Pointing device	PS/2 Compatible Optical mouse	
13	Audio/ Graphics Systems	❖ PCI 3D audio/video cards ❖ TV/FM cards ❖ Amplified speakers (External)	
14	Communication Interface	❖ 10/100/1000Gbs fast ethernet, RJ 45 jack ❖ 56K ITU V.90 data/fax modern, wake-on-ring ready	
15	Operating System Pre-load plus CDs	Windows 10 Professional 64	
16	Application Software, pre-installed, registered and CDs supplied	MS OFFICE 2017 OR MS OFFICE XP PRO (2017 Version)	
17	Power sub- system	220-240V ac, 50HZ	
18	Power extension cord	At least four outlets with surge protection	
C	WARRANTY	One year parts replacement warrant	

2.14.2) SPECIFICATIONS FOR LAPTOP COMPUTERS

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	BIDDER'S SPECIFICATIONS
A	GENERAL SPECIFICATIONS		
1	Make	BRANDED HP	
2	Model	HP ZBook G4 / HP UltraBook	
3	Country of Origin		
4	Manufacturer's brochure and specifications	Must be supplied	
B	TECHNICAL SPECIFICATIONS		
5	Processor	Intel® Core™ i7-4600U with Intel HD Graphics 4400 (2.7 GHz, 4 MB cache, 2 cores)	
6	System Memory	GB 2700 MHz DDR3 SDRAM (1 x 8 GB)	
7	Display/Graphics	15.6" diagonal LED - backlit FHD SVA anti - glare (1920 x 1080)	
8	Storage sub system	750GB SATA SSD	
		DVD/CD – WRITE DRIVE	
		Memory Card Reader	
9	Keyboard and Pointing Device	<ul style="list-style-type: none"> ❖ 84/85/88 – Key ❖ 12 function keys, 4 cursor keys ❖ Built in pointing device ❖ Embedded numeric keyboard 	
11	Audio System	<ul style="list-style-type: none"> ❖ PCI 3D audio/video cards ❖ TV/FM cards ❖ Amplified speakers ❖ Built in microphone 	
12	Communication Interface	<ul style="list-style-type: none"> ❖ 10/100/1000Gbs fast Ethernet Port ❖ 56K ITU V.90 data/fax modern, ❖ PCM CIA Card ❖ Wireless Connectivity Card ❖ GPRS Port 	
13	Operating System Pre-load	Windows 10 Professional	
14	Application Software installed Registered and CDs supplied	MS OFFICE 2013 OR MS OFFICE XP Professional (2013 Version)	
15	Accompanying accessories	<ul style="list-style-type: none"> ❖ Optical Mouse ❖ Touch pad ❖ Leather carrying case/bag 	
16	Battery Module	3 – Cell 56Wh Li - ion	
C	WARRANTY	One year parts replacement warrant (Certificate given)	

2.14.3) SPECIFICATIONS FOR LIGHT DUTY UPS

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	BIDDER'S SPECIFICATIONS
A	GENERAL SPECIFICATIONS		
1	Make	BRANDED	
2	Model		
3	Country of Origin		
4	Manufacturer's brochure and specification	Must be supplied	
B	TECHNICAL SPECIFICATIONS		
5	Rating	650VA	
6	Input voltage swing	220 – 270V ac	
7	Output voltage	220-240V ac	
8	Output frequency	50-60HZ auto-sensing	
9	Protection	❖ Output overload ❖ Input/output short circuit	
10	Communication Interface	Serial port communication support	
11	Design	❖ Automatic voltage regulation ❖ Mains isolation ❖ User replaceable batteries ❖ Static-automatic bypass ❖ Maintenance bypass	
12	Battery Module	❖ 25 minute backup time ❖ 3 year lifetime ❖ Sealed lead acid type preferred ❖ Automatic periodic battery tests ❖ Short recharge time (maximum 5 hours for 100% run time) ❖ Protection against excessive discharge	

Other Items to be supplied:

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

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 **V.A.T, Withholding tax and all other taxes applicable at the time of tender**).
6. Any bid returned with unfilled Schedule of Unit Rates shall be considered technically non-responsive, and the bidder shall automatically be disqualified.

SCHEDULE OF UNIT RATES

(To be completed by the Tenderer)

ITEM	DESCRIPTION	QTY/UNIT	RATE(KSHS)
1.	Cat 6e UTP 4-pair cable	1Roll	
2.	4 core Multi mode fiber cable	1M	
3.	6 core Multi mode fiber cable	1M	
4.	4 core Multi mode fiber outdoor cable	1M	
5.	6 core Multi mode fiber outdoor cable	1M	
6.	48 port Cisco switch model WS-3850-48PC with PoE and approved by engineer	1No.	
7.	Ditto but 12port	1No.	
8.	22U Wall Mounted Data Cabinet	1No.	
9.	42U Ground Mounted Data Cabinet	1No.	
10.	Single port Cat 6E angled Faceplate	1No.	
11.	CAT 6E UTP 4-Pair Cable	1M	
12.	CAT 6A STP 4-Pair Cable	1M	
13.	2KVA Rack Mounted UPS	1No.	
14.	5KVA Rack Mounted UPS	1No.	
15.	2U Cable Manager	1No.	

SECTION F

BILLS OF QUANTITIES

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 **Value Added Tax (V.A.T)**, **Withholding tax and all other taxes applicable at the time of tender**).

In accordance with Government policy, the Value Added Tax (V.A.T) and Withholding Tax **shall be deducted** from all payments made to the tenderer, and the same shall be forwarded to the **Kenya Revenue Authority (KRA)**.

3. All prices omitted from any item, section or part of the Bills of Quantities shall be deemed to have been included to another item, section or part thereof.
4. The brief 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 **Grand Price Summary Page of the Bills of Quantities for Main Works**.
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. UPS, Edge Switches, CAT 6 Cables, Patch Panels e.t.c.

The brochures are to be used to ascertain the suitability of the **ACTIVE** electronic components, UPS etc. being offered by the bidders. Bidders not complying with this requirement shall be considered technically non-responsive and may subsequently be disqualified.

BILL NO. 1 : SUB-CONTRACT PRELIMINARIES

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
1.00	Discrepancies clause - Sub-contractor shall include all work either shown on the Contract Drawings or detailed in the specification. No claim or extra cost shall be considered for works which has been shown on the drawings or in the specification alone.	1	Item		
2.00	Payments clause - Payment will be made through certificates to the Main Contractor, unless he specifically agrees to forego this right, in which case direct payment can be made to the Domestic Sub- contractor. All payments will be less retention as specified in the Main Contract. No payment will become due until materials are delivered to site.	1	Item		
3.00	Scope of contract works clause - The sub-contractor shall supply, deliver, unload, hoist, fix, test, commission and hand-over in satisfactory working order the complete installations specified hereinafter and/or as shown on the Contract Drawings attached hereto, including the provision of labour, transport and plant for unloading material and storage, and handling into position and fixing	1	Item		
4.00	Extent of contractors duties clause - The Sub- contractor shall be responsible for verifying all dimensions relative to his work by actual measurements taken on site. Shall mark accurately on one set of drawings and indicate all alterations and/or modifications carried out to the designed system during the construction period. This information must be made available on site for inspection by the Engineer.	1	Item		
5.00	Firm price contract clause - No claims will be allowed for increased costs arising from the fluctuations in duties and/or day to day currency fluctuations. The Sub-contractor will be deemed to have allowed in his tender for any increase in the cost of materials which may arise as a result of currency fluctuation during the contract period.	1	Item		
6.00	Variation clause - Any variation from the contract price in respect of any extra work, alteration or omission requested or sanctioned by the Architect or Engineer shall be agreed and confirmed in writing at the same time such variations are decided and shall not affect the validity of the Contract. Schedule of Unit Rates shall be used to assess the value of such variations. No allowance shall be made for loss of profit on omitted works.	1	Item		
7.00	Prime cost and provisional sum clause The work covered by Prime Cost and Provisional Sums may or may not be carried out at the discretion of the Project Manager. The whole or any part of these sums utilized by the Sub-contractor shall be deducted from the value of the Sub-contract price when calculating the final account.	1	Item		
8.00	Government legislation and regulations clause - Sub- contractor shall allow for providing holidays and transport for work people, and for complying with Legislation, Regulations and Union Agreements. The Sub-contractor must also make himself acquainted with current legislation and any Government regulations regarding the movement, housing, security and control of labour, labour camps, passes for transport, etc.	1	Item		
9.00	Import duty and VAT clause - (Note this clause applies for materials supplied only whether imported or locally manufactured. The tenderer shall make full allowance in his tender for all such taxes.	1	Item		
10.00	Insurance company fees clause - Attention is drawn to the tenderers to allow for all necessary fees, where known, that may be payable in respect of any fees imposed by Insurance Companies or statutory authorities for testing or inspection.	1	Item		
11.00	Samples and materials generally clause - The Sub- contractor shall, when required, provide for approval at no extra cost, samples of all materials to be incorporated in the works. Such samples, when approved, shall be retained by the Engineer and shall form the standard for all such materials incorporated.	1	Item		
	Sub-Total C/F to Next Page				

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	Sub-Total B/F from Previous Page				
22.00	Testing and inspection - installation clause - Allow for testing each section of the Sub-contract Works installation.	1	Item		
23.00	Initial Maintenance Clause - The sub-contractor shall make routine maintenance once a month during the liability for the Defects Period and shall carry out all necessary adjustments and repairs, cleaning and oiling of moving parts. A monthly report of the inspection and any works done upon the installation shall be supplied to the Engineer. Shall allow in the sub-contract Sum of the initial maintenance, inspection and break-down service	1	Item		
24.00	Local and other authorities notice clause - The contractor shall comply with and give all notices required by any Regulations, Act or by Law of any Local Authority or of any Public Service, Company or Authority who have any jurisdiction with regard to the works or with those systems the same are or will be connected and he shall pay and indemnify the Government against any fees or charges legally demandable under any regulation or by-law in respect of the works; provided that the said fees and charges if not expressly included in the contract sum or stated by way of provisional sum shall be added to the contract sum.	1	Item		
25.00	Temporary Works clause - The contractor shall include for the cost of and make necessary arrangements with the Project Manager for such temporary works.	1	Item		
26.00	Patent Rights clause - The contractor shall fully indemnify the Government of Kenya; against any action, claim or proceeding relating to infringement of any patent or design rights, and pay any royalties which may be payable in respect of any article or any part thereof, which shall have been supplied by the contractor to the Project Manager.	1	Item		
27.00	Mobilization and Demobilization clause -No claim will be entertained where the contractor has not made any provision for mobilization and demobilization of labour, plant and equipment in the preliminary bills of quantities.	1	Item		
28.00	Supervision by Engineer and site meetings clause - A competent Project Engineer appointed by the Chief Engineer as his representative shall supervise the Contract works. The Project Engineer shall be responsible for issuing all the site instructions in any variations to the works and these shall be delivered through the Contractor with the authority of the Project Manager. Any instructions given verbal shall be confirmed in writing. The Sub Contractor shall in his tender allow for the provision of management meetings and site inspections, as instructed by the Engineer, and also profit and attendance on these funds. The funds shall be expended according to Project Manager's instructions to the Contractor.	1	Item	250,000.00	250,000.00
29.00	Allow for Taxes, Profit and Attendance for the above Item		%		
30.00	Contract obligation and employers obligation clause - No claims will be entertained for pre-financing of the project by the sub-contractor, or for loss of profit (expectation loss) in case of premature termination, reduction or increase of works as the sub-contractor shall be deemed to have taken adequate measures in programming his works and expenditure and taken necessary financial precaution while executing the works.	1	Item		
31.00	Any other preliminaries	1	Item		
	Total for Bill No. 1: Sub-Contract Preliminaries C/F to Price Summary Page				

Bidders MUST either insert percentage or indicate as NIL for the following clauses:

(1) Attendance Upon Tradesmen, etc. **(Insert percentage only)** clause 1.58 of Section C

.....%

(2) Extended Preliminaries **(Insert percentage only)** Clause 1.66 of Section C

.....%

BILL NO. 2 - SCHEDULE NO. 1: 2NO. TYPICAL WAREHOUSES (2,500 SQM)

SCHEDULE NO. 1A: GROUND FLOOR

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	Supply, Install, Test and Commission the following :-				
	HORIZONTAL CABLING				
1A.01	Cat 6A, UTP 4-pair cable as Siemon or its equal and approved equivalent pulled between cabinet and outlet plates.	2,000	Lm.		
1A.02	3M, RJ45-RJ45 Cat 6A, UTP factory terminated patch cords as Siemon or its equal and approved equivalent for use at workstation area for data outlets.	14	No.		
1A.03	3M, RJ45-RJ11 factory terminated patch cords as Siemon or its equal and approved equivalent between Data outlet and Telephone handsets.	14	No.		
1A.04	1M, RJ45-RJ45 Cat 6A, UTP factory terminated patch cords as Siemon or its equal and approved equivalent to be used in cabinet.	14	No.		
1A.05	RJ45 Cat 6A, UTP (Dual) Data and Voice outlets complete with faceplates and labelling system as Siemon or its equal and approved equivalent.	14	No.		
	BACKBONE CABLING BETWEEN GROUND FLOOR & FIRST FLOOR AND GENERAL REQUIREMENTS				
1A.06	1000BASE X 8-Core Fibre Optic Cable as data backbone to Server Room complete with connectors and all terminations to active components.	40	Lm.		
1A.07	1000Base-SX Multicore SFP fibre modules as CISCO or approved equivalent.	2	No.		
1A.08	Dual Fibre optic patch leads.	4	No.		
1A.09	Cable Ties and Self Adhesive Labels for Cable Labelling (Packets of 200 Labels each)	1	Item		
1A.10	450mm x 50mm deep Deep Perfotrated GI cable tray complete with all accessories As Manufactured by Power Technics or approved equivalent.	20	Lm.		
	CABINETS				
1A.11	27U, 600mmx800mm, 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.		
1A.12	24 Port RJ45 Cat 6A, Data/Voice Patch Panel for UTP termination as Siemon or its equal and approved equivalent.	2	No.		
1A.13	2U Cable Manager/Organizers as Siemon SA002021 or its equal and approved equivalent.	2	No.		
1A.14	240V, 50Hz, 2000VA, Rack Mountable APC Smart-UPS RM SMT3000 RM 2U (240V) Un-interupted Power Supply unit (UPS) with USB and Serial Port or an approved equivalent.	1	No.		
1A.15	Grounding and bounding kit complete with 50mm diameter copper bounding bar and 6mm thick green and yellow wire. The Earthing of the system is to be to the approval of the Engineer.	1	Lot		
	ACTIVE COMPONENTS				
1A.16	24 Port POE+ Edge Switch as described in particular specifications as Cisco Catalyst 9300-24P Series or its approved equivalent.	2	No.		
1A.17	Any other Item necessary for successful completion of this installation as per the system you propose to instal. (Please list the items, price and include in your totals)				
	a)				
	b)				
	Total for Schedule No. 1A: Ground Floor C/F to Price Collection Page				

PRICE COLLECTION PAGE: SCHEDULE NO. 1: 2NO. 2,500MM2 TYPICAL WAREHOUSES

ITEM	DESCRIPTION	AMOUNT (KSHS)
1.00	TOTAL FOR SCHEDULE NO. 1A: GROUND FLOOR B/F FROM PAGE H/5	
2.00	TOTAL FOR SCHEDULE NO. 1B: FIRST FLOOR B/F FROM PAGE H/6	
	TOTAL FOR 1NO. WAREHOUSE = [A]	
	TOTAL FOR 2NO. WAREHOUSES = 2x[A]	
	TOTAL FOR SCHEDULE NO. 1: 2NO. TYPICAL WAREHOUSES C/F TO PRICE SUMMARY PAGE	

SCHEDULE 2: PROJECT MANAGER'S STATIONERY

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	Supply and deliver to the Project Manager the following stationery to be used in running the project: These shall then be delivered upon their first demand to the Office of the Chief Engineer (Electrical) immediately after the award to the Successful Tenderer.				
2.01	Photocopying paper white A4 80g/M ² (Reams).	4	No.		
2.02	Photocopying paper green A4 80g/M ² (Reams).	2	No.		
2.03	Conqueror paper blue A4 80g/M ² (Reams).	2	No.		
2.04	HP Laser Jet Cartridges				
	i) CC364A	3	No.		
	ii) Q7553A	3	No.		
	iii) CE505A	3	No.		
2.05	Laptop Computer Intel corei7 fifth generation processor /3.2GHz Quad-core/16GB System RAM/750GB SSD/DVD RW/ win10/HD15.6" Screen/carry case as Hp Zbook G4.	1	No.		
Total for Schedule No. 2: Project Manager's Stationery C/F to Price Summary Page					

SCHEDULE 3: CONTINGENCY SUM AND OTHERS

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
3.01	Allow a Contingency Sum of Kshs. Five Hundred Thousand (Kshs.500,000.00) to be used at the discretion of the Project Manager.	1	Item	500,000.00	500,000.00
3.02	Labelling: Allow for Labelling of all Telecommunication Cables, Active Devices and Telecommunications Points and all necessary documentation	1	Item		
3.03	Allow for 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).	1	Item		
3.04	Allow for preparation and production of 3No. Sets of "As Installed Drawings" for all Works in this Contract (Hard & Soft Copies in AutoCAD 2019).	1	Item		
	Total for Schedule No. 3: Contingency Sum and Others C/F to Price Summary Page				

PRICE SUMMARY PAGE - STRUCTURED CABLING WORKS

ITEM	DESCRIPTION	AMOUNT (KSHS)
1.00	TOTAL FOR SUB-CONTRACT PRELIMINARIES B/F FROM PAGE H/4	
2.00	TOTAL FOR SCHEDULE NO. 1: 2NO. TYPICAL WAREHOUSES B/F FROM PAGE H/7	
3.00	TOTAL FOR SCHEDULE NO. 2: PROJECT MANAGER'S STATIONERY B/F FROM PAGE H/8	
4.00	TOTAL FOR SCHEDULE NO. 3: CONTINGENCY SUM AND OTHERS B/F FROM PAGE H/9	
	TOTAL FOR C/F TO GRAND PRICE SUMMARY PAGE OF THE BOQ FOR MAIN WORKS	

Total Amount in Words (Kenya Shillings)

.....

Bidder's Name & Official Stamp

P.O. Box.....

Signature.....Date.....

PIN NO.....V.A.T Certificate NO.....

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

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

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. This schedule shall form part of the technical evaluation criterion, and tenderers are therefore advised to complete the schedule as they shall be considered responsive.

TECHNICAL SCHEDULE OF ITEMS TO BE SUPPLIED
(To be completed by the Tenderer)

ITEM	DESCRIPTION	TYPE/MAKE	MODEL	COUNTRY OF ORIGIN
1	Edge Switch			
2	CAT 6 Cable			
3	Patch Panels			
4	UPSs			
5	Data Cabinets			
6	Data Outlet			
7	SFP Fibre Modules			
8	Cable Managers			
9	Patch Cords			
10	Faceplate			

SECTION H

STANDARD FORMS

CONTENTS OF SECTION H

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

NOTE:

- 1.0 Tenderers must duly fill these Standard Forms as a mandatory requirement as they will form part the evaluation criteria.

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 OF EQUIPMENT	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
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.