

Republic of the Philippines

Professional Regulation Commission
P. Paredes St., Sampaloc, Metro Manila
Facsimile: 310-0037 / email: prcbac2013@gmail.com



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Section VII. Technical Specifications

Procurement for the Supply, Delivery, Installation, Testing and Commissioning of Network Equipment and Structured Cabling System (Network Infrastructure Rehabilitation) – ITB No. 2019-20

I. REQUIREMENTS OF THE SUPPLIER

By accepting the Terms of Reference (TOR), the Contractor/Supplier confirms that their company meets the following conditions:

- Contractor must have at least two (2) years of experience in supply, delivery, installation testing and commissioning of network equipment, structured cable system, server room design and construction and database system development.
- 2. At least two (2) similar projects in supply, delivery, installation, testing and commissioning of network equipment, structured cable system, server room design and construction and database system development. This should be vouched by a Certificate of Completion from at least one (1) Government Agency in the Philippines.
- Shall shoulder all damages and will take sole responsibilities against all liabilities and damages arising from injuries or disabilities to persons, or damages to property occasioned by any or omission of the contractor, or any of his subcontractors, including any and all legal expenses or otherwise.
- 4. Shall be held solely responsible for any property or personal damages or claims, including damage to existing structures, systems, equipment and/or site caused by the BIDDER shall repair or replace it to its original condition at no additional cost to the office/agency.
- 5. Should have been operating in the Philippines for two (2) years and is registered with SEC or DTI.
- Is fully committed to undertake this engagement in accordance with the scope of work defined and any instructions issued by the Commission, where necessary.
- 7. Will maintain professional independence through the duration of the engagement.
- Must have at least one (1) Licensed Electronics Engineer or its equivalent who is currently employed in the contractor's company trained and certified in the design and installation of the cabling system.
- Must have at least one (1) certified technical engineer or its equivalent on the network switch brand offered.



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II. SCOPE OF WORK

- Supplier shall include additional components required to make the system operate, although not specifically detailed in this specification.
- 2. The work herein described shall fully completed in every detail for the function designated and it is hereby required that the BIDDER in the accepting the contract, agrees to furnish all apparatus, materials and labor not herein specifically mentioned or included to furnish but which may found necessary to complete, perfect or test any portion of the network or function.
- 3. Work with the chief of ICTS Office to resolve unplanned issues
- 4. All pricing should reflect government and corporate discounts where applicable
- 5. Provide on-site engineer during the implementation of the project.
- Design, supply implementation, rehabilitation and transfer an appropriate cost-effective, practical and secured network infrastructure solution system that will interlink all computer and other peripheral devices in PRC office main and annex building.
- Provide 24x7 technical support and assistance in maintaining the operability and availability of the system within the warranty period.
- Supplier shall asses and recommends best design and equipment, configuration to interlink all computer and other peripheral devices in PRC office main and annex building.
- Must send an analyst recommend the best possible network design and get optimal coverage at the most reasonable cost without compromising the transmission of data or bandwidth.

III. DELIVERABLES

Supply, Delivery, Installation and Configuration of the following:

- Multi-mode Fiber Optic Cable, Outdoor Type, 6-Core
- 2. Multi-Mode Fiber Patch Panel SC Loaded 16 Ports
- 3. SC 10G OM3/OM4 Duplex Multimode Fiber Optic Adapter
- 4. Blank Fiber Adapter Panel
- 5. Multi-Mode Duplex Fiber Patch Cords
- 6. SC Connectors
- 7. UTP Cable Cat6, 4-pairs
- 8. Cat6 UTP Patch Panel 24-ports
- 9. Cat6 UTP Information Outlets for Patch Panel
- 10. Cat6 UTP Information Outlets
- 11. Faceplates Simplex
- 12. UTP Patch Cords (2.0m)
- 13. UTP Patch Cord (3.0m)
- 14. Cable Manager (1U)
- 15. 10G Manage Switch PoE, 24-port
- 16. License for Network Switch Support and Maintenance
- 17. 10GBASE-SR SFP Module
- 18. Intermediate Distribution Frame (IDF)
- 19. Enterprise Network Management System



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IV. TECHNICAL SPECIFICATION

GENERAL REQUIREMENTS:

1. MANUFACTURER

Only products listed under the Underwriters Laboratories (UL) and Telecommunications Industry Association/Electronics Industries Alliance (TIA/EIA) standards will be accepted.

2. GENERAL SPECIFICATION

- a. Fiber Optic Cable shall be used as the backbone of the network that interconnects Main Distribution Frame (MDF) and Intermediate Distribution Frame (IDF).
- b. CAT 6 UTP Cable shall be primarily use for distribution that will run through from IDF to Switches and Data Outlet.
- c. All cable trays for horizontal homeruns shall be sized accordingly based on the number of nodes and at least twenty percent (30%) provision for expansion. Cable tray size should be at least 300mm width and 100mm depth (W x D).
- d. All cable trays/ladder shall be power coated or hot dip galvanized and all conduits for horizontal homeruns shall be PVC with connector coupling.
- e. All conduits for the backbone cables shall be an Electrical Metallic Tubing (EMT) pipe with connector coupling and all cable trays/conduit support or hangers shall be permanently anchored on the ceiling.
- f. Deployment and installation of network racks are related to structure cabling technical implementation.

3. PASSIVE COMPONENT

a. Fiber Optic Cable

- Designed and tested to conform to the fiber and cable performance requirements of the TIA 568, ISO 11801, and ICEA-569 standards.
- Cable must meet or exceed all of performance requirements for current and proposed applications such as IEEE 802.3 Ethernet including 10 Gigabit Ethernet, ATM, Fiber Channel, FDDI and others.
- Shall be all-dielectric and consist of eight (8) tight-buffered, 850nm laser-optimized 50/125:m multimode fibers surrounded by aramid strength members and PVC outer jacket.
- 4. Optical fibers are made of silica glass surrounded by acrylate coating. Tight-buffer material is flame rated PVC. Strength members are aramid yams. Central members are glass-reinforced plastic (GRP). Cable and subunit jackets are flame-rated PVC.
- 5. Shall have a UL/NEC rating of OFNR (Riser).
- 6. Performances characteristics must be 3.5dB/km max attenuation at 850nm and 1.5 dB/km max attenuation at 1300nm; OFL bandwidth 1500 MHz-km at 850nm and 500 MHz-km at 1300nm; 850nm laser bandwidth at 2000MHz-km; 1000BaseSx distance of 900m; 1000BaseLX distance at 550m; 10Gbase-SR of 300m; and 10GbaseLX4 distance of 300m.

b. Fiber Optic Panel

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ELIEZER C. LEYCO Member Rack-mounted drawer-type Fiber Optic Panel loaded with 16 SC ports.

2. Must have sensor strip conductive pads within the panel.

c. End-Connectors

- Duplex SC connectors at fiber panel termination.
- 2. Duplex SC connectors for network equipment connection

d. Fiber Optic Patch Cords

- Duplex SC connectors at fiber panel termination.
- 2. Patch cable assembly must contain copper conductor connected to an external probe.
- External probes must contact with sensor pad on the sensor strip.
- One wire/one probe design to monitor duplex fiber port as single connection.

e. Cat 6 Cables

- Standardization ISO/IEC 11801 ed. 1.0, Ed 1.0 2017-11, IEC 61156-5 2nd ed. EN50173-1, EN 50288-6-1, TIA 568-C.2
- 2. Protection Class IP: IP20
- 3. PoE
- 4. Type : Installation Cable
- 5. U/UTP Shielding
- 6. Fire Rating: Eca
- 7. Cable Jacket Characteristics : Flame Retardant
- Cable Overall Diameter: 5.3~6.2mm
- 9. Conductor: AWG24
- 10. Number of Wires: 8
- 11. Stranding: 4 Pairs
- 12. Wire Type: Wire
- 13. Max. Test Frequency: 250 Mhz
- 14. Jacket Color: RAL 7035 Light Gray

f. Cat 6 Patch Panels

- 1. Patch panels shall be 1RU and provide 24 modular jack ports, with universal wiring that maybe terminated to T586A or T568B.
- 2. Patch panel modular jacks shall be configured as 6-port, replaceable modules.
- The front of each module shall be capable of accepting 9mm to 12mm labels. Each port shall be capable of accepting an icon to indicate its function.
- 4. Patch panel shall terminate the building cabling on 110-style insulation displacement connectors.
- Patch panel shall meet or exceed the performance requirements of ANSI/TIA/EIA-568B.2-1.
- Must have sensor strip conductive pads within the panel.
- 7. Must include a rear clip that secures and protects the mated connection of the sensor strip and analyzer I/O cable assembly.
- 8. Patch panel must be UL listed.

g. Cat 6 Data Outlet/Modular Jacks

- 1. Modular jacks shall be terminated using a 110-style pc board connector, color-coded for both T568A and T568B wiring.
- Cat 6 modular jacks shall meet the performance requirements listed in ANSI/TIA/EIA-568B.2-1.

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ELIEZER C. LEYCO Member **3.** Flexibility to support 180° to 90° cable termination with bend-limiting strain relief.

Modular jack shall be UL listed.

h. Faceplates

Faceplate shall be suitable for RJ45 connection modules, connection module or 4xRJ45 and fiber optic connectors with support plates

Quality ABS plastic resin

- 2. Faceplate 114x70 mm for 2 RJ45 ports, including fastening screws
- 3. Available for 4 R&M RJ45 ports, options as well
- 4. Label strips
- 5. Comes in 2 colors, white and black

i. Cat 6 Patch Cords.

- Compliant with Cat. 6 Class E (250 MHz) requirements: ISO/IEC 11801 ed. 2.2, Cat. 6 component standard IEC 60603-7-4, Cat. 6 component standard IEC 60603-7-5 and fulfilled the standard IEC 61935-2:2010
- 2. Factory terminated with R&M IDC contacts
- 3. Heavy metal free cable characteristics
- 4. Overall diameter of 4.7mm
- 5. RAL Code 7035 light gray color
- 6. Can accommodate color coding and mechanical coding "Easy Latch", "Data Safe Lock" and "Safe-Clip". Strain-relief function in acc. with TIA 568-C

j. Cable Organizer

- Horizontal cable management hardware must be 1 RU
- Must have black-coated finish

k. Network Switch (24 port PoE)

- Multilayer switch -1 RU Snmall Factor Pluggable 24 Port 10/100/1000 Ethernet ports PoE+ with 2x 10 Gigabit Ethernet SFP/SFP+ Lan Base
- Must deliver up-to 108 Gbps forwarding bandwidthand 92.5 Mpps of forwarding rate
- Must support 80G of stack bandwidth with up to 8 maximum stack members
- 4. Must support at least 4096 VLAN ID's and 1000 Active VLANs
- 5. Must support optional external redundant AC power supply
- Software support for IPv4 and IPv6 routing, multicast routing, modular quality of service (QoS), Flexible NetFlow (FNF) Version 9, and enhanced security features
- Supports Universal Software image across all license levels, providing an easy upgrade path for software features
- 8. Must have 10/100 Mbps Ethernet (RJ-45) Network Management Enterprise.
- 9. Must have the following Layer 2 features: 1). IP unicast routing protocols (static, Routing Information Protocol Version 1 [RIPv1], and RIPv2, RIPng, Enhanced Interior Gateway Routing Protocol [EIGRP] stub) are supported for small-network routing applications with the IP Base feature set. Limited static routing with the LAN Base feature set. Equal-cost routing facilitates Layer 2 load balancing and redundancy across the stack. 2). Policy-based routing (PBR)

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ELIEZER C. LEYCO Member allows superior control by facilitating flow redirection regardless of the routing protocol configured. Virtual routing and forwarding (VRF)-Lite enables a service provider to support two or more VPNs, with overlapping IP addresses 3). IPv6 addressing is supported on interfaces with appropriate show commands for monitoring and troubleshooting

- 10. Must have the following industry standards: IEEE 802.1D Spanning Tree Protocol, IEEE 802.1p CoS Prioritization, IEEE 802.1Q VLAN IEEE 802.1s, IEEE 802.1w, IEEE 802.1X, IEEE 802.1ab (LLDP), IEEE 802.3ad, IEEE 802.3af and IEEE 802.3at, IEEE 802.3ah (100BASE-X single/multimode fiber only), IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports, IEEE 802.3 10BASE-T, IEEE 802.3u 100BASE-TX, IEEE 802.3ab 1000BASE-T, IEEE 802.3z 1000BASE-X, RMON I and II standards, SNMP v1, v2c, and v3, IEEE 802.3az, IEEE 802.3ae 10Gigabit Ethernet, IEEE 802.1ax
- **11.** Must support Operating Temperature of -5°C to +45°C, up to 5000 feet (1500m)
- **12.** Must have a Mean-Time-Between-Failures (MTBF) of 325,780
- Must Support Relative Humidity of 10% to 95% noncondensing
- 14. Must support up to 600Mhz Dual Core CPU
- Must support up to USB (Type-B) Ethernet (RJ45) Console Port
- 16. Must support up to USB (Type A) for external Flash Storage
- 17. Must support up to 512 MB DRAM
- 18. Must support up to 128 MB Flash memory
- 19. Must support up to 4,096 Total VLAN IDs
- 20. Must support up to 1000 Total Switched Virtual Interfaces (SVIs)
- 21. Must support up to 9216 bytes of Jumbo Frames Ethernet Frame
- 22. 50CM Type 2 Stacking Cable
- 23. Must support 9198 bytes of maximum transmission unit (MTU) L3 pocket
- 24. Provides Either Reseller or Distributor with Firejumper Certification

I. Enterprise Management System (EMS)

- The platform must provide complete cross-domain visibility of IT infrastructure issues
- 2. The platform must consolidate monitoring events from across layers such as Network, Server, Application, Database etc.
- 3. The solution should support single console for automated discovery of enterprise network components e.g. network device, servers, virtualization, cloud, application and databases
- The solution must support custom dashboards for different role users such as Management, admin and report users
- The solution must allow creating custom data widget to visualize data with user preferences e.g. Refresh time, time span, background color, unit conversion
- The solution must support multiple visualization methods such as gauge, grid, charts, Top N etc.



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ELIEZER C. LEYCO Member 7. The proposed solution must support capacity views to find most consumed resources

 The solution should provide superior view of infrastructure health across system, networks, application and other IT Infrastructure components into a consolidated, central console

m. Network Performance Management

 The proposed solution platform shall provide a single integrated solution for comprehensive management of the wired/wireless access, and rich visibility into connectivity and performance assurance issues. (thru SNMP protocol)

2. The design functionality shall facilitate creation of templates used for monitoring key network resources, devices, and attributes. Default templates and best practice designs are provided for quick out-of-the- box implementation automating the work required to use OEM validated designs and best practices

3. The proposed solution must provide comprehensive and integrated management of IT infrastructure components to maximize the availability of IT services and SLA performance

4. The proposed solution must provide the complete view of the Topology and network elements. The NMS shall have the ability to include the network elements and the links in the visual/graphical map. The visual maps shall display the elements in different color depending upon the status of the element. It is preferable that green color for healthy and amber/yellow color for degraded condition and red for unhealthy condition is used

The proposed solution must have suitable system level backup mechanism for taking backup manually as well as automatically

The proposed solution must keep historical data at raw level without averring for minimum of six month

The proposed solution must be able to display relationships of the monitored device components to its health status and show its origin

8. The proposed solution must provide Health Monitoring reports of the network with settable periodicity -@24 Hrs, 1 week, 1 month.

The proposed solution must provide the graphical layout of the network element using different colors to indicate their status

10. The proposed solution must provide calendar view which allows the operator all the schedule activities such as Reports, Discovery scans etc. It shall also allow to define scheduled report for uptime, link status etc.

11. The proposed solution should have multiple alerting feature to get the notification via email, SMS and third party systems

12. The proposed solution must support listening to traps and syslog events from the network devices with retention period up to 6 months.

13. The proposed solution must support defining the data retention period to control storage

14. The solution must support custom device template to support Generic SNMP devices, WINRM and SSH protocols

15. The solution must provide discovery of heterogeneous physical network devices like Layer-2 & Layer-3 switches, Routers and other IP devices and do mapping of LAN & WAN connectivity with granular visibility up to individual ports level

16. It shall provide Real time network monitoring and Measurement end-to-end Network performance & availability to define service

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ELIEZER C. LEYCO Member levels and further improve upon them

17. Must able to have a monitoring panel of all the alerts & notifications where the monitoring team can post activity notes

V. OTHER INSTRUCTIONS

1. LABELING

All jacks, panels and frames shall be clearly labeled. Labels should be tamper resistant and made with a label maker at the station end. Data frames should be created with label maker. Label color shall be black on white.

2. TESTING

All cables and termination hardware shall be 100% tested for defects in the installation and to verify cable performance under installed conditions. Any defect in the cabling system installation including but not limited to cable, connectors, patch panels, and connector blocks shall be repaired or replaced in order to ensure 100% useable conductors in all cables installed.

3. FIBER OPTIC CABLE INSTALLATIONS

Shall pass the following bi-directional Testing Parameters using Level III Cable Tester:

- a) Propagation Delay
- b) Attenuation

4. CAT 6 UTP CABLE INSTALLATIONS

Shall pass the following end-to-end Testing Parameters using Level III Cable Tester:

- a) Attenuation
- b) Attenuation to Crosstalk Ratio (ACR)
- c) PowerSum Attenuation to Crosstalk Ratio (PSACR)
- d) Near End Crosstalk (NEXT)
- e) PowerSum Near End Crosstalk (PSNEXT)
- f) Equal Level Far-End Crosstalk (ELFEXT)
- g) PowerSum Equal Level Far-End Crosstalk (PSELFEXT)
- h) Return Loss
- i) Propagation Delay
- j) Delay Skew
- k) Transfer Impedance

Distribution of Nodes

Location	Voice	Data
Main Building		
1 st Floor	5	78
2 nd Floor	8	92
3 rd Floor	4	18
Annex Building		
1 st Floor	2	40
2 nd Floor	6	72
3 rd Floor	7	66
4 th Floor	3	31
5 th Floor	1	5
TOTAL	36	402

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VII. REMOVAL OF DEFFECTIVE UNAUTHORIZED WORK

1. Any defective work, whether the result of poor workmanship, defective materials, damaged through carelessness or any other cause, found to exist prior to acceptance, shall be removed immediately and replaced by work and material which shall conform to the approved specifications, or shall be otherwise remedied in an acceptable manner

VIII. MISCELLANEOUS

1. Professional Regulation Commission (PRC) shall have the authority to impose rules and regulations in compliance with the requirements of the project

2. The contractor shall ensure that there will be no disruption to the day-today operation of PRC during the implementation of the project

3. All work shall be performed in a workmanlike manner. PRC personnel may observe the work procedures and workmanship of the bidder but such observation will not relieve the bidder from the responsibility for performance

4. Dismantling of existing (old cabling) upon completion of new structured cabling system infrastructure

IX. MAINTENANCE, SUPPORT AND WARRANTY

- The Bidder shall provide technical support via telephone, email and onsite assistance to resolve technical and other related problems. Resolution can be delivered in form of telephone, electronic and/or onsite resolution. It shall refer to a condition wherein the reported problem is resolved by the proponent to the satisfaction of the end-user
- 2. The Bidder shall resolve a problem within twenty-four (24) hours after it was reported by PRC in any available fastest means of communication
- 3. Provide four (4) hours response time for hardware and related problems and issues
- Establish procedure on support and problem escalation
- 5. Provide at least two (2) support personnel two (2) months after the acceptance of the project
- 6. Within the warranty period, equipment that cannot be repaired within twenty-four (24) hours shall be immediately replaced with a service unit of similar specification or better
- 7. The Contractor shall guarantee that the entire structured cabling and networks are free from all defective workmanship and materials, and will remain so for the period of:
 - a) 20-25 Years of Product Warranty from the Cabling Manufacturer of the Product offered



Republic of the Philippines

Professional Regulation Commission
P. Paredes St., Sampaloc, Metro Manila
Facsimile: 310-0037 / email: prcbac2013@gmail.com



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8. Inspection and cleaning of data cabinets and switches shall be done by the bidder on a quarterly basis

9. A warranty period of year shall commence upon issuance of the Certificate of Acceptance

X. PROVISION OF DOCUMENTATION

- 1. The Bidder shall provide a complete documentation for every deliverables and at every end of each development stage and milestone which must be submitted to the Professional Regulation Commission (PRC) for the approval. PRC shall own any and all documents and shall reserve the right to reproduce at no additional cost
- 2. The documentation must be written in English of durable construction with concise and high quality presentation to include but not limited to the following:
 - Technical Manuals
 - a) Infrastructure Diagrams and Topology
 - b) Troubleshooting and Installation Guide
 - c) System/Operation Manual
 - Operational Manuals
 - a) User Manual (For Operations)
 - b) Disaster Recovery Plan

XI. TRAINING AND TECHNOLOGY TRANSFER

- The Contractor must provide advance training for the Network Equipment/Switches, basic troubleshooting for the Structured Cabling for at least four (4) IT Personnel
- 2. To ensure that proper maintenance and sustainment an appropriate training shall be conducted by the proponent as Essential Part of Technology Transfer to prepare and equipped PRC and its personnel in the overall operations and maintenance of its Network Infrastructure
- The proponent shall submit Program of Instruction (POI) detailing all the training activities to be conducted for review, evaluation and approval of PRC. Hands-on training shall be form part of the training program
- 4. Operation and training manuals shall be provided to each participant
- The training shall be conducted and completed prior the formal turnover and acceptance
- 6. All expenses related to the training shall be borne by the proponent
- 7. Certificate of Training/s shall be given to all participants
- Compliance with the statements must be supported by evidence in a Bidders Bid and cross-referenced to that evidence. Evidence shall be in the form of manufacturer's un-amended sales literature, unconditional statements of specification and compliance issued by the manufacturer, samples, independent test data etc., as appropriate.
- A statement that is not supported by evidence or is subsequently found to be contradicted by the evidence presented will render the Bid under evaluation liable for rejection.

Page 60 of 63 BIDDING DOCUMENT



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ELIEZER C. LEYCO Member 3. A statement either in the Bidders statement of compliance or the supporting evidence that is found to be false either during Bid evaluation, post-qualification or the execution of the Contract may be regarded as fraudulent and render the Bidder or supplier liable for prosecution subject to the provisions of ITB Clause 3.1 (a) (ii) and/or GCC Clause 2.1 (a) (ii).

ACKNOWLEDGMENT AND COMPLIANCE
WITH THE TERMS OF REFERENCE FOR THE
PROCUREMENT OF THE SUPPLY, DELIVERY, INSTALLATION, TESTING, AND
COMMISSIONING OF NETWORK EQUIPMENT AND STRUCTURED CABLING SYSTEM
(NETWORK INFRASTRUCTURE REHABILITATION)

SIGNATURE OVER PRINTED NAME
OF AUTHORIZED REPRESENTATIVE,
DESIGNATION AND PRINTED NAME OF COMPANY