

# MEPNN Supplier Scouting Opportunity Synopsis

## Section 1: General Information

Scouting Number	2024-391
Item to be Scouted	BABA - Low Voltage Telecommunications Infrastructure
Days to be scouted	24
Response Due By	01/04/2025
Description	United States manufacturers of BABAA-compliant Compliant Low Voltage Telecom Cabling Products for use in an addition and remodel of an existing Hospital located in Iowa.
Notify Requester Immediately	No
State item to be used in	Iowa

## Section 2: Technical Information

Type of supplier being sought	Other
Details	Manufacturer/Distributor
Reason	BABA
Describe the manufacturing processes (elaborate to provide as much detail as possible)	Domestic components in each of the BABAA compliant manufactured products must exceed 55% of the total component cost and be assembled in the United States.
Provide dimensions / size / tolerances / performance specifications for the item	See attached construction project technical specification.
List required materials needed to make the product, including materials of product components	See attached construction project technical specification.
Are there applicable certification requirements?	Yes
Details	Build America, Buy America Act (BABAA) compliant Must be able to submit BABAA manufactured product self-certification manufactured product letter for each product that details a compliant product.
Are there applicable regulations?	Yes
Details	See attached construction project technical specification.
Are there any other standards, requirements, etc.?	No
NAICS 1	
NAICS 2	
Additional Technical Comments	See attached construction project technical specification.  Products must come from the same manufacturer for this project to meet system 10 year warranty requirements.  Manufacturers shall specialize and have experience in the manufacturing of the designated components.

## Section 4: Business Information

Estimated potential business volume	Fiber connector - 100 TFP Fiber Termination/Splice Panel - 2 M-Series Modular Jack, RJ45, Cat6 Unshielded - 1110 M4800 1U Angled Modular Panel, 48 port - 14 L Type Flush Mounted Faceplate, four port white - 312 Surface Mount Box, universal, two ports, white - 20 M20 Dust Cover for M-Series Faceplates and Outlets, white - 200 Adapter Pack, Black, 1000-Type, with 1 lazerSPEED 12 fiber, MM LC ganged adapter - 6 50 Pair Block With Legs - 3 5MHZ TO 1.0 GHz Splitter 8-way 30 M81C Coaxial Coupler 30 ProSNS RG-6 Universal "F" Coax Compression Connector 7 Split Bolt 2
Estimated target price / unit cost information (if unavailable explain)	TBD - Negotiated after BABA compliance confirmed
When is it needed by?	Q3 - 2025
Describe packaging requirements	No requirements - Arrive undamaged
Where will this item be shipped?	Iowa

## Additional Comments

Is there other information you would like to include?	<p>Provide written documentation in response to the Supplier Scouting request of being a current Build America Buy America Act compliant telecom equipment manufacturer with experience manufacturing the system components meeting the product performance requirements.</p> <p>Information on BABAA compliance requirements can be found at Made in America Office link <a href="https://www.madeinamerica.gov/">https://www.madeinamerica.gov/</a>.</p> <p>Agency - USDA - Submitted through CBS Contact - Joe Edmondson</p>
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## List of Required Telecommunication Cabling Products

Product ID	Manufacturer	Customer Description	Qty
QWIK-FUSE	Commscope	Fiber connector	100
TFP-1TT00-000B	Commscope	TFP Fiber Termination/Splice Panel	2
UNJ600T-BL	Commscope	M-Series Modular Jack, RJ45, Cat6 Unshielded	1110
M4800A-1U-PS	Commscope	M4800 1U Angled Modular Panel, 48 port	14
M14L-262	Commscope	L Type Flush Mounted Faceplate, four port white	312
SMB-2P-262	Commscope	Surface Mount Box, universal, two ports, white	20
M20AP-262	Commscope	M20 Dust Cover for M-Series Faceplates and Outlets, white	200
PNL-BK-012-MFA-LC12-AQ	Commscope	Adapter Pack, Black, 1000-Type, with 1 lazerSPEED 12 fiber, MM LC ganged adapter	6
GB110BK-50	Allen Tel	50 Pair Block With Legs	3
CT2108	Allen Tel	5MHZ TO 1.0 GHz Splitter 8-way	30
M81C-Coupler	Commscope	M81C Coaxial Coupler	30
FSNS6U-25	Belden	ProSNS RG-6 Universal "F" Coax Compression Connector	7
KS20RK	Burndy	Split Bolt	2

**SECTION 271005**  
**TELECOMMUNICATIONS CABLING INFRASTRUCTURE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Backbone copper
- B. Backbone optical fiber
- C. Horizontal copper
- D. Patch panels
- E. Optical fiber distribution panel
- F. Work area outlets
- G. Optical fiber connectors
- H. Wall mounted copper terminations
- I. Grounding and bonding products

**1.02 SUMMARY**

- A. Work included, but not limited to:
  - 1. Data network backbone cable installation
  - 2. Data network horizontal cable installation
  - 3. Data wiring closet setup
  - 4. Infrastructure cabling management
  - 5. Data patch cables
  - 6. Ground and bonding
  - 7. Testing requirements

**1.03 GENERAL REQUIREMENTS**

- A. The drawings and specifications indicate the intent and direction of the installation. Items and their location are shown diagrammatic and are to be field verified by the cabling contractor prior to completing work associated with the item.
- B. All cabling work shall be performed in strict accordance with all applicable laws, ordinances, codes of local, state and federal government, or other authorities having lawful jurisdiction. The cabling contractor is required to verify all requirements.
- C. The cabling contractor shall furnish all required labor, material, and associated tools to facilitate the installation of all the infrastructure cables and associated items specified herein and with respect to the infrastructure design drawings without damage to the cables, associated items, and/or facilities.
- D. Qualified personnel, utilizing state-of-the-art equipment and techniques shall complete all installation work.
- E. All cables routed outside of the cable runway installed shall be properly supported.
- F. All wall and/or floor penetrations shall be via metal conduit sleeves properly sized, supported and fire stopped.
- G. All materials shall be installed in accordance with the manufacturer's specified recommendations and practices.

**1.04 QUALITY ASSURANCE**

- A. Standards: All telecommunications wiring, cabling devices, and other associated items and work shall conform to the most recent requirements of the following codes, standards, and organizations where applicable:
  - 1. American National Standards Institute (ANSI)
  - 2. Electronic Industries Association (EIA)
  - 3. Federal Communications Commission (FCC)

4. Institute of Electrical and Electronic Engineers (IEEE)
  5. International Organization for Standardization (ISO)
  6. National Electric Code (NEC)
  7. National Fire Protection Association (NFPA)
  8. BOCA National Building Code
  9. Underwriter's Laboratories (UL)
  10. Telecommunications Industry Association (TIA)
  11. Building Industry Consulting Services International
  12. Society of Cable Telecommunications Engineers (SCTE)
- B. The copper data infrastructure cable system shall have a manufacturer's material and labor performance certification for the installed cable and components. The certification shall be that UTP Category 6 cabling infrastructure will perform to TIA's specifications for that Category. A manufacturer's written certification document shall be submitted at the completion of the project.
  - C. A matched solution shall be provided end-to-end for all cabling infrastructure. No third party components shall be provided unless otherwise noted elsewhere in the project specification or drawings.
  - D. The installer must be able to provide a warranty to the owner. Duration of the warranty shall be a minimum of ten years from the date of project completion and acceptance. It shall cover all of the product as well as their performance for the warranty period.
  - E. The cabling contractor shall be in business for a minimum of five (5) years.
  - F. The contractor must be registered with BICSI and have at least one Registered Communications Distribution Designer (RCDD) on full-time staff. Provide copy of certificate with submittals.
  - G. The contractor must possess current liability insurance certificates.
  - H. Provide a complete and detailed test plan for the telecommunications cabling system including a complete list of test equipment for the components and accessories for each cable type specified, 30 days prior to the proposed test date. Include procedures for certification, validation, and testing.

#### **1.05 SUBMITTALS**

- A. The cabling contractor shall not begin any installation of materials that require a material fact sheet and/or sample to be submitted and approved by the project engineer. If material is installed prior to approval, the bidder is liable for the cost of removal and replacement if the material is not approved.
- B. The cabling is to provide material cut-sheet for all products (including cabling) listed in this specification, and any other material not listed but required for proper installation.
- C. Provide both the manufacturer's certification for all installers and technicians that will have a role in this project as well as all BICSI certifications as outlined in the sections above.
- D. Provide most recent calibration certificate for testing equipment indicating the period of calibration.

#### **1.06 CLOSE-OUT AND FINAL ACCEPTANCE**

- A. Operations and Maintenance Manuals
  1. Commercial off the shelf manuals shall be furnished for operation, installation, configuration, and maintenance of products provided as a part of this project. Submit operations and maintenance data not later than 2 months prior to the date of occupancy.
- B. Drawings and As-Builts
  1. Provide drawings including documentation on cables and termination hardware in accordance with TIA/EIA-606. Drawings shall include schedules to show information for cut-overs and cable plant management, patch panel layouts and cover plate assignments, cross-connect information and connecting terminal layout as a minimum. Drawings shall

be provided in hard copy format and on electronic media for project engineer's review and final delivery to owner. Provide the following drawing documentation as a minimum:

- a. Cables - A record of installed cable shall be provided in accordance with TIA/EIA-606. The cable records shall include only the required data fields in accordance with TIA/EIA-606. Include manufacture date of cable with submittal.
- b. Termination Hardware - A record of installed patch panels, cross-connect points, distribution frames, terminating block arrangements and type, and outlets shall be provided in accordance with TIA/EIA-606. Documentation shall include the required data fields only as a minimum in accordance with TIA/EIA-606.
- c. Working Red Line Drawings - A hand completed set of drawings indicating the general cable routing of the backbone cables and the primary routes of the horizontal cables shall be provided. Also indicate all wall and floor sleeves utilized. The drawings for this information shall be a non-working, clean set of drawings.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. The cabling contractor shall coordinate all delivery, storage and handling concerns with the general contractor.
- B. Provide protection from weather, moisture, extreme heat and cold, dirt, dust, and other contaminants for telecommunications cabling and equipment placed in storage.

#### **1.08 APPROVED CABLING VENDORS**

- A. All cabling and connectivity products provided by the structured cabling contractor shall be part of the following complete end-to-end systems:
  1. Superior Essex (Basis of Design)
  2. Panduit
  3. Belden
  4. Commscope
  5. BerkTek
  6. Engineer approved equal.
- B. All components in the cabling channel shall be of the same manufacturer with performance that meets or exceeds the characteristics of the horizontal cabling.

#### **1.09 JACKET TYPE**

- A. This project is planned to have all ducted returns on HVAC equipment. It shall be this contractor's responsibility to make final confirmation. Once confirmed, PVC jacketed cable shall be used. If there are any wild returns on this project, plenum rated cable shall be used.

#### **1.10 COLORS**

- A. The owner shall determine all colors of cables, jack inserts, and other visible components during the submittal process from the standard colors available by each individual manufacturer. No custom colors will be used.

### **PART 2 PRODUCTS**

#### **2.01 BACKBONE COPPER**

- A. Category 3 rated multipair backbone cable
  1. Provide copper backbone cabling that shall be solid conductor, 24 AWG, 100 ohm, 25-pair, UTP, in accordance with TIA-568-C.1, TIA-568-C.2, formed into 25 pair binder groups covered with a thermoplastic jacket. Cable shall be imprinted with manufacturer's name or identifier, flammability rating, gauge of conductor, transmission performance rating at regular length marking intervals. Provide plenum (CMP) rated cabling.
    - a. Superior Essex (Basis of Design)
  2. Quantity: Refer to the drawings for further information.

#### **2.02 BACKBONE OPTICAL FIBER**

- A. Multimode Fiber Optic Cabling

1. Provide 12-strand tight buffered fiber optic multimode, 50 micron OM3, laser optimized cabling from the main distribution frame to each intermediate to each intermediate distribution frame.
  - a. Superior Essex (Basis of Design)
  - b. Corning
  - c. Commscope
  - d. OCC
2. Quantity: Refer to the drawings for further information.

### **2.03 HORIZONTAL COPPER**

- A. Data and Voice:
  1. Provide unshielded Twisted Pair (UTP), Category 6 4/pair, 23 AWG to locations identified on the plans.
    - a. Superior Essex - DataGain 6+ (Basis of Design)
    - b. Panduit
    - c. Commscope Uniprise
    - d. Belden
    - e. BerkTek
    - f. Engineer approved equal
    - g. Cabling shall be also provided to each video surveillance camera shown on the plans unless otherwise noted.
    - h. Color to be determined by the owner.
- B. Patch Cables - Data Racks (Copper):
  1. Provide pre-connectorized copper patch cables that match performance and configuration of horizontal data and voice cabling. Length as required for installation per BICSI standards.
  2. Quantity: Structured cabling subcontractor shall provide sufficient patch cords for 75% of horizontal cable runs. For bidding purposes, use an average cord length of 10 feet for patch cords.
  3. Color and exact length shall be determined by the owner.
- C. Patch Cables - Workstations:
  1. Match performance and configuration of horizontal data and voice cabling. Length as required for installation per BICSI standards
  2. Quantity: Structured cabling subcontractor shall provide a workstation patch cord quantity equal to 50% of all wall-terminated data outlets. For bidding purposes, use an average cord length of 10 feet for patch cords. Patch cords shall be turned over to owner.
  3. Color and exact length shall be determined by the owner.

### **2.04 PATCH PANELS**

- A. Data and Voice:
  1. Modular 24 or 48 position, 19 inch rack, 1U or 2U, UTP angled patch panel. Panel to meet performance standards of horizontal cabling manufacturer. Patch panel bracket shall accept RJ45 modular jacks that are utilized at the work area outlet.
    - a. Product shall be a matched solution from cabling manufacturer
    - b. Quantity as needed for all connections in contractor plus 25% at each rack for future growth.

### **2.05 OPTICAL FIBER DISTRIBUTION PANEL**

- A. Panel shall be a rack mounted optical fiber distribution panel constructed utilizing a minimum of 18 gauge steel. Panel shall be divided into two sections, distribution and user. Distribution section shall have strain relief, routing guides, splice tray and shall be lockable. The user section shall have a cover for patch cord protection. Each panel shall provide multimode pigtailed and adapters. Provide adapters as LC type.
  1. Product shall be a matched solution from cabling manufacturer.

- B. Provide pre-connectorized fiber patch cables with matching connectors as specified. Patch cords shall meet same performance requirements as backbone fiber optic cabling. Length as required for installation per BICSI standards.
  - 1. Product shall be a matched solution from cabling manufacturer.

## **2.06 WORK AREA OUTLETS**

- A. Work Area Data/Voice Jacks:
  - 1. Jacks shall be modular RJ-45 style and meet performance requirements of horizontal cabling.
    - a. Product shall be a matched solution from cabling manufacturer.
- B. Work Area Outlet Cover Plate:
  - 1. Telecommunications cover plates shall comply with TIA-568-C.1 and shall be oversized constructed of high impact thermoplastic material and match the style and color of receptacles and switch cover plates. Provide any blank inserts as required for all unused openings.
    - a. Product shall be a matched solution from cabling manufacturer.
- C. Voice Wall-Mounted Outlet:
  - 1. Provide stainless steel phone faceplate with steel screw terminals and information outlet capable of RJ45 connection to normal phone.
    - a. Product shall be a matched solution from cabling manufacturer.

## **2.07 OPTICAL FIBER CONNECTORS**

- A. Optical fiber connectors shall all be of the LC style unless noted elsewhere.

## **2.08 WALL FIELD COPPER TERMINATIONS**

- A. Provide 25 pair 110 style insulation displacement blocks for cable terminations. Termination block shall be performance rated to the category cabling being installed.
  - 1. Product shall be a matched solution from cabling manufacturer.

## **2.09 GROUNDING AND BONDING PRODUCTS**

- A. Provide in accordance with UL 467, TIA J-STD-607, and NFPA 70. Components shall be identified as required by TIA/EIA-606. Provide ground rods, bonding conductors, and grounding busbars as specified in specification section 26 0526 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.

## **PART 3 EXECUTION**

### **3.01 GENERAL**

- A. The drawings and specifications are considered to reflect the intent and direction for a complete data cable system.
- B. Quantities shown are for general information and may be incorrect. The bidder is to verify all quantities and is to report any count differences to the engineer prior to submission of their installation response. The cabling contractor will be held responsible for all required quantities to complete the project to the intent and direction of the drawings and specifications.
- C. Material description and manufacturer's part numbers are shown. The cabling contractor is expected and has the responsibility to verify that the part number matches the description. Any discrepancy is to be noted to the engineer prior to response submittal. The cabling contractor is responsible for the correct materials being furnished and installed.
- D. Install telecommunications cabling and pathway systems, including the horizontal and backbone cable, pathway systems, telecommunications outlet/connector assemblies, and associated hardware in accordance with TIA-568-C.1, TIA-568-C.2, TIA-569, NFPA 70 and UL standards as applicable. Provide cabling in a star topology network. Pathways and outlet boxes shall be installed as specified in specification section 26. Install telecommunications cabling with copper media in accordance with the following criteria to avoid potential electromagnetic interference



between power and telecommunications equipment. The interference ceiling shall not exceed 3.0 volts per meter measured over the usable bandwidth of the telecommunications cabling.

- E. Install UTP and optical fiber telecommunications cabling system as detailed in TIA-568-C.1. Screw terminals shall not be used except where specifically indicated on plans. Use an approved insulation displacement connection tool kit for copper cable terminations. Do not exceed manufacturers' cable pull tensions for copper and optical fiber cables. Provide a device to monitor cable pull tensions. Do not exceed 25 pounds pull tension for four pair copper cables. Do not chafe or damage outer jacket materials. Use only lubricants approved by cable manufacturer. Do not over cinch cables, or crush cables with staples. For UTP cable, bend radii shall not be less than four times the cable diameter. Cables shall all be terminated. There shall be no cable with unterminated elements. Cabling shall be continuous with no splices. Label cabling in accordance with paragraph titled LABELING.
- F. This contractor is to install if they are licensed to, or contract with a licensed electrician to install conduit serving low voltage cables located in all mechanical rooms and non-accessible areas and exposed structural areas. Use cable trays in other areas as indicated on the drawings. Where cable trays are not accessible, use J-hooks equal to Cablofil or Caddy Cable CAT. No cable shall be allowed to lie on accessible ceilings tiles.
- G. Provide sleeves between walls and accessible clouds. Provide hooks with closure holes and cable ties. Mount hooks 3 feet on center.

### **3.02 BACKBONE CABLING**

- A. Copper backbone cable. Install intrabuilding backbone copper cable, in indicated pathways, between the campus distributor, located in the telecommunications entrance facility or room, the building distributors and the floor distributors located in telecommunications rooms and telecommunications equipment rooms as indicated on drawings.
- B. Optical fiber backbone cable. Install intrabuilding backbone optical fiber in indicated pathways. Do not exceed manufacturer's recommended bending radii and pull tension. Prepare cable for pulling by cutting outer jacket 10 inches, leaving strength members exposed for approximately 10 inches. Twist strength members together and attach to pulling eye. Vertical cable support intervals shall be in accordance with manufacturer's recommendations.

### **3.03 HORIZONTAL CABLING**

- A. Install horizontal cabling as indicated on drawings. Do not untwist Category 6/6A UTP cables more than one half inch from the point of termination to maintain cable geometry. Provide slack cable in the form of a figure eight (not a service loop) on each end of the cable, 10 feet in the telecommunications room, and 12 inches in the work area outlet.

### **3.04 PATHWAYS**

- A. Provide in accordance with TIA-569 and NFPA 70. Provide building communications cabling pathway as specified in Section 26 0533 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS and Section 27 0528 PATHWAYS FOR COMMUNICATION SYSTEMS.

### **3.05 WORK AREA OUTLETS**

- A. Terminate UTP cable in accordance with TIA-568-C, TIA-568-C.2 and wiring configuration as specified. All fiber optic cabling shall be terminated in accordance with TIA-568-C.3. Follow manufacturer's installation guidelines for all specific requirements related to work area outlet termination.

### **3.06 COVER PLATES**

- A. As a minimum, each outlet shall be labeled as to its function and a unique number to identify cable link in accordance with the section titled LABELING.

### **3.07 PULL CORDS**

- A. Pull cords shall be installed in conduit serving telecommunications outlets that do not have cable installed.

### **3.08 PATCH PANELS**

- A. Patch panels shall be mounted in equipment racks with sufficient ports to accommodate the installed cable plant plus 25 percent spares. Copper entering a patch panel shall be secured to the panel as recommended by the manufacturer to prevent movement of the cable.

### **3.09 EQUIPMENT RACKS, BRACKETS AND CABINETS**

- A. All equipment racks, brackets and cabinets hosting telecommunications equipment shall all be installed in accordance with the manufacturer's recommendations. Permanently anchor all racks to the floor.

### **3.10 GROUNDING AND BONDING**

- A. Provide in accordance with TIA J-STD-607, NFPA 70 and as specified in Section 26 0526 GROUNDING & BONDING FOR ELECTRICAL SYSTEMS.

### **3.11 LABELING**

- A. Provide labeling in accordance with TIA/EIA-606. Handwritten labeling is unacceptable. Stenciled lettering for voice and data circuits shall be provided using either thermal ink transfer or laser printing.
- B. Cables shall be labeled using color labels on both ends with identifiers in accordance with TIA/EIA-606.
- C. Workstation outlets and patch panel connections shall be labeled using color coded labels with identifiers in accordance with TIA/EIA-606.

### **3.12 WIRELESS SYSTEM - POST INSTALL**

- A. The environment shall be reliant on the stability, performance and facilities-wide coverage of this new wireless network. It shall be this contractor's responsibility to perform a post-installation signal strength test to verify complete coverage is being provided in each of the new project areas.
- B. The wireless access system shall be tested at project substantial completion. Provide a report with readings and layout showing detected coverage by Ekahau or AirMagnet analyzers. Deliver in electronic format for engineer review.
- C. The wireless system coverage report may result in some adjustments to the wireless access point layout. This contractor shall assist in a one-time device relocation to achieve full coverage, so far as the installed cable will allow.
- D. No hand-written test results will be accepted.

### **3.13 CABLE TESTING**

- A. General: Cables are to be tested after installation is complete with Fluke DTX tester or equivalent and delivered in electronic format for engineer review. If for any reason, the drop location, raceway and/or drop location box is removed for additional work of any nature, the drop location is to be re-tested if previously tested. All cables associated with the drop location are to be re-tested. The cost of re-testing is the responsibility of the cabling contractor.
  - 1. The field-test instrument shall be within the calibration period recommended by the manufacturer, typically 12 months.
- B. Category 6/6A Data - Unshielded Twisted Pair (UTP) Cable:
  - 1. Each UTP CAT 6 data cable installed shall be tested and a test result printout sheet shall be furnished at the completion of the project.
  - 2. The test shall be performed after the final cable and device termination has been completed and the faceplate installed. The test shall be of the "Basic Link" from completed end to completed end.
  - 3. The test shall be conducted utilizing a scanner that will generate a sweep frequency 1-250 megahertz signal on all pairs of the cable and test each pair of the cable for:
    - a. Pair mapping
    - b. Cable length

- c. Insertion loss
  - d. Near-End-Cross Talk (NEXT)
  - e. Attenuation to Near-End-Cross Talk Ratio (ACR)
  - f. Return loss (RL)
  - g. Power Sum Near-End-Cross Talk (PSNEXT)
  - h. Power Sum Equal Level Far-End-Cross Talk (PSELFEXT)
  - i. Far End Cross Talk (FEXT)
  - j. Propagation Delay & Delay Skew
  - k. Impedance
  - l. Capacitance
  - m. Resistance
4. Each data cable shall be tested to EIA/TIA-568, Category 6, compliance for acceptance.
  5. Each test result shall indicate the cable number, test date and tester name. All test results are to be submitted to the project engineer in electronic format for review during closeout and final acceptance.
  6. No hand written test results will be accepted by the project engineer.
- C. Fiber Optic Cable
1. Each strand in fiber optic cable shall be tested for correctness of termination, overall transmission loss, and defects using an approved Optical Time Domain Reflectometer (OTDR) and a power meter. The engineer shall have the option to be present during testing. Notify the engineer one week prior to testing.
  2. Pre-terminated fiber solutions shall be tested by factory providing termination. Field testing is not required.
  3. Testing Equipment manufacturers:
    - a. Agilent Technologies
    - b. Fluke
    - c. Microtest
    - d. Noyes
    - e. Ideal
  4. Multimode fiber testing shall be I.A.W. TIA/EIA-526-14 Method "B". System loss measurements (both calculated and measured) shall be provided at 850 and 1300nm in both directions for multimode cables (1310 and 1550nm for singlemode) for each strand. Per IEEE 802.3z, maximum fiber strand attenuation shall not exceed 2.38dB @ 850nm with a modal bandwidth of 160Mhz-km and 2.35dB @ 1310nm with a modal bandwidth of 500Mhz-km. Test as follows:
    - a. Measure and record normalized fiber loss at operating wavelength in dB/km.
    - b. Detect and record point faults or discontinuities.
    - c. Measure and record overall length of cable.
  5. Certification report shall be provided listing both the calculated and measure loss for each fiber optic circuit and submitted with the test results as called for above. Documentation of testing shall include:
    - a. Wavelength, fiber type, fiber manufacturer and cable model number, cable manufacturers' attenuation specifications, cable manufacturers' bandwidth specifications, measurement direction, test equipment and serial numbers (with date of last calibration), date of each test, reference setup, name of technician(s) performing testing.
    - b. OTDR trace(s) shall be submitted with require for substantial completion.
  6. Each test result shall indicate the cable number, test date and tester name. All test results are to be submitted to the project engineer in a neat, clean and orderly nature. The test sheets are to be submitted electronically and divided by panel in numeric order.
  7. No handwritten test results will be accepted by the project engineer.

**3.14 EXTRA MATERIALS AND LABOR**

- A. This contractor shall include in their bid an allowance to install 16 additional data outlets with an average length of 200 feet as directed by the project engineer at any time during the construction process. Any materials that are not used during construction shall be turned over to the owner at the final acceptance of the building.

**END OF SECTION 271005**