

**SECTION 27 15 00**  
**COMMUNICATIONS STRUCTURED CABLING**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This section specifies modifications to an existing complete and operating voice and digital structured cabling distribution system, including associated equipment and hardware, in the facility.

**1.2 SUBMITTALS**

- A. Certifications:
1. Test system cables and certify to Owner before proof of performance testing can be conducted. Identify each cable as labeled on as-installed drawings.
  2. Provide current and qualified test equipment OEM training certificates and product OEM installation certification for contractor installation, maintenance, and supervisory personnel.

**1.3 WARRANTY**

- A. As required by Owner.

**PART 2 - PRODUCTS**

**2.1 PERFORMANCE AND DESIGN CRITERIA**

- A. Provide complete system including fiber optic distribution cables, connectors, and all equipment necessary for a complete and functional system.
- B. Industry Standards:
1. Provide supplies and materials listed by a nationally recognized testing laboratory where such standards are established for supplies, materials or equipment.
- C. System Performance: Provide complete system to meet or exceed that in use at the facility.
- D. Terminate all interconnecting twisted pair, fiber-optic or coaxial cables on patch panels or punch blocks. Terminate unused or spare conductors and fiber strands. Do not leave unused or spare twisted pair wire, fiber-optic or coaxial cable unterminated, unconnected, loose or unsecured.
- E. Color code distribution wiring to conform to ANSI/TIA 606-B and construction documents, whichever is more stringent. Label all equipment, conduit, enclosures, jacks, and cables on record drawings, to facilitate installation and maintenance.

- F. In addition to requirements in Section 27 05 11, REQUIREMENTS FOR COMMUNICATION INSTALLATIONS, provide stainless steel faceplates with plastic covers over labels.

## **2.2 EQUIPMENT AND MATERIALS**

### **A. Cable Systems - Twisted Pair, Fiber optic, Coaxial and Analog:**

#### **1. General:**

- a. Provide cable (i.e. backbone, outside plant, and horizontal cabling) conforming to accepted industry standards with regards to size, color code, and insulation.
- b. Some areas can be considered "plenum". Comply with all codes pertaining to plenum environments. It is contractor's responsibility to review the cable requirements with Owner prior to installation to confirm type of environment present at each location.
- c. Provide proper test equipment to confirm that cables meet each OEM's standard transmission requirements, and ensure cable carries data transmissions at required speeds, frequencies, and fully loaded bandwidth.

#### **2. Fiber Optic Backbone Cable:**

- a. Provide 62.5/125 micron OM4 multi-mode cable, containing strands of fiber of type matching existing conditions.
- b. Terminate multimode fibers at both ends with connectors suitable to connect to existing equipment. Provide minimum 610 mm (2 ft.) cable loop at each end.
- c. Test all fiber optic strands' cable transmission performance in accordance with TIA standards. Measure attenuation in accordance with fiber optic test procedures TIA-455-C ('-61', or -53).  
Provide written results to Owner for review and approval.

### **B. Conduit and Signal Ducts:**

#### **1. Conduit:**

- a. Provide conduit or sleeves for cables penetrating walls, ceilings, floors, interstitial space, fire barriers, etc.
- b. Minimum Conduit Size: 19 mm (3/4 inch).
- c. Provide separate conduit and signal ducts for each cable type installation.
- d. Maximum 40 percent conduit fill for cable installation.

2. Signal Duct, Cable Duct, or Cable Tray: Use existing signal duct, cable duct, and cable tray, when identified and accepted by Owner.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install for ease of operation, maintenance, and testing.
- B. Install system to comply with NFPA 70 National Electrical Code and original equipment manufacturers' (OEM) installation instructions.
- C. Labeling:
  - 1. Industry Standard: Provide labeling to match that in use at the facility.

### **3.2 FIELD QUALITY CONTROL**

- A. Interim Inspection:
  - 1. Verify that equipment provided adheres to installation requirements of this section.
  - 2. Perform fiber optical field inspection tests via attenuation measurements on factory reels and provide results along with manufacturer certification for factory reel tests. Remove failed cable reels from project site upon attenuation test failure.
- B. Acceptance Test:
  - 1. Schedule an acceptance test date and give Owner 30 days' written notice prior to date acceptance test is expected to begin.
  - 2. Test only in presence of Owner.
  - 3. Test utilizing approved test equipment to certify proof of performance.
  - 4. Verify that total system meets the requirements of this section.
- C. Verification Tests:
  - 1. Multi-mode Fiber Optic Cable: Perform end-to-end attenuation tests in accordance with TIA-568-B.3 and TIA-526-14A using // Method A, Optical Power Meter and Light Source // and // Method B, OTDR //. Perform verification acceptance test.
- D. Performance Testing:
  - 1. Fiber Optic Links: Perform end-to-end fiber optic cable link tests in accordance with TIA-568-B.3.
- E. Total System Acceptance Test: Perform verification tests for fiber optic cabling systems after complete telecommunication distribution system and workstation outlet are installed.

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