

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Copper Cable and Terminations:
 - 1. Copper twisted pair cables.
 - 2. Modular jacks.
 - 3. Copper twisted pair patch cords.
- B. Fiber Optic Cable and Interconnecting Devices:
 - 1. Fiber optic cables.
 - 2. Fiber optic connectors.
- C. Communications Equipment Room Fittings:
 - 1. Copper panels.
 - 2. Fiber panels.
 - 3. Equipment racks.
 - 4. Horizontal/vertical cable managers.
 - 5. Cable runways.
 - 6. Fiber raceways.
- D. Communications faceplates.

1.2 REFERENCE STANDARDS

- A. BICSI N1 - Installation Practices for Telecommunications and ICT Cabling and Related Cabling Infrastructure, 1st Edition; 2019.
- B. EIA/ECA-310 - Cabinets, Racks, Panels, and Associated Equipment; 2005e.
- C. ICEA S-83-596 - Indoor Optical Fiber Cable; 2021.
- D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

- E. TIA-526-7 - Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant, Adoption of IEC 61280-4-2 Edition 2: Fibre-Optic Communications Subsystem Test Procedures – Part 4-2: Installed Cable Plant – Single-Mode Attenuation and Optical Return Loss Measurement; 2015a (Reaffirmed 2022).
- F. TIA-526-14 - Optical Power Loss Measurement of Installed Multimode Fiber Cable Plant; IEC 61280-4.1 Edition 3.1, Fiber Optic Communications Subsystem Test Procedures- Part 4-1: Installed Cable Plant- Multimode Attenuation Measurement; 2023d.
- G. TIA-568 (SET) - Commercial Building Telecommunications Cabling Standard Set; 2023.
- H. TIA-568.2 - Balanced Twisted-Pair Telecommunications Cabling and Components Standards; 2018d, with Addenda (2020).
- I. TIA-568.3 - Optical Fiber Cabling and Components Standard; 2022e.
- J. TIA-569 - Telecommunications Pathways and Spaces; 2019e, with Addendum (2022).
- K. TIA-606 - Administration Standard for Telecommunications Infrastructure; 2021d.
- L. TIA-607 - Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises; 2019d, with Addendum (2021).
- M. UL 94 - Tests for Flammability of Plastic Materials for Parts in Devices and Appliances; Current Edition, Including All Revisions.
- N. UL 444 - Communications Cables; Current Edition, Including All Revisions.
- O. UL 1651 - Fiber Optic Cable; Current Edition, Including All Revisions.
- P. UL 1863 - Communications-Circuit Accessories; Current Edition, Including All Revisions.
- Q. UL 2024 - Standard for Cable Routing Assemblies and Communications Raceways; Current Edition, Including All Revisions.
- R. UL 2416 - Audio/Video, Information and Communication Technology Equipment Cabinet, Enclosure and Rack Systems; Current Edition, Including All Revisions.
- S. UL 514C - Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers; Current Edition, Including All Revisions.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate work to avoid placement of other utilities or obstructions within spaces dedicated for communications equipment.
2. Coordinate arrangement of communications equipment with dimensions and clearance requirements of actual equipment to be installed.
3. Notify Architect of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.4 SUBMITTALS

- A. See Section 01 33 00 - Submittal Procedures for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.
- C. Field Quality Control Submittals: Documentation of cable testing results and corrective actions taken.
- D. Executed warranty.
- E. Project Record Documents: Indicate actual locations of system components and cable routing.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company with at least 10 years of experience manufacturing copper and fiber structured cabling systems.
- B. Supplier Qualifications: Authorized by structured cabling system manufacturer.
- C. Installer Qualifications:
 - 1. Company with at least 3 years experience in installation and testing of structured cabling.
 - 2. Employing Certified BICSI Technicians (TECH) for supervision of work.
 - 3. Certified by structured cabling system manufacturer.
- D. Product Listing Organization Qualifications: Organization recognized by OSHA as Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

- A. Maintain field conditions within manufacturer's required service conditions before, during, and after installation.

1.7 WARRANTY

- A. See Section 01 77 00 - Contract Closeout for additional warranty requirements.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: CommScope, Inc; SYSTIMAX; www.commscope.com/#s

2.2 STRUCTURED CABLING SYSTEM - GENERAL REQUIREMENTS

- A. Comply with the following:
 - 1. TIA-568 (SET).
 - 2. TIA-569.
 - 3. TIA-607.
 - 4. NFPA 70.
 - 5. Requirements of authorities having jurisdiction.
 - 6. Applicable local codes.

2.3 COPPER CABLE AND TERMINATIONS

- A. Copper Twisted-Pair Cables:
 - 1. Comply with TIA-568.2; listed as complying with UL 444.
 - 2. Cable Applications:
 - a. Plenum Applications: Use listed NFPA 70 Type CMP plenum cable.
 - b. Riser Applications: Use listed NFPA 70 Type CMR riser cable or Type CMP plenum cable.
 - c. General Purpose Applications: Use listed NFPA 70 Type CM/CMG general purpose cable, Type CMR riser cable, or Type CMP plenum cable.
 - 3. Products:

- a. Part numbers specified are for boxes or reels with 1,000-foot (305 m) cable length unless otherwise indicated.
 - b. SYSTIMAX GigaSPEED XL Category 6 U/UTP Cable, nonplenum CMR rated, 4-pair, 23 AWG; 1071E Series.
 - 1) Cable Jacket Color - Network: Blue (BLU), P/N 760004689.
 - c. SYSTIMAX GigaSPEED X10D Category 6A U/UTP Cable, nonplenum CMR rated, 4-pair, 23 AWG; 1091B Series.
 - 1) Cable Jacket Color - Network: Blue (BLU), P/N 760107094.
- B. Modular Jacks:
- 1. Description: RJ-45, nonkeyed, 8-position modular jacks with insulation displacement connectors (IDC); high-impact thermoplastic housing.
 - 2. Comply with TIA-568.2, match cable; UL 1863 listed.
 - 3. Color code for both T568A and T568B wiring configurations.
 - 4. Plug Insertion Life: 750 times, minimum.
 - 5. Flammability: Comply with UL 94.
 - 6. Products:
 - a. SYSTIMAX GigaSPEED XL MGS400 Series Category 6 U/UTP Modular Jacks.
 - 1) Mountable at 90 or 45 degrees in M-series faceplates.
 - 2) Color - Network: Blue, P/N 700206758.
 - b. SYSTIMAX GigaSPEED X10D MGS600 Series Category 6A U/UTP Modular Jacks.
 - 1) Mountable at 90 or 45 degrees in M-series faceplates.
 - 2) Color - Network: Blue, P/N 760092452.
- C. Copper Twisted Pair Patch Cords:
- 1. Description: Factory-fabricated, 4-pair cable assemblies with RJ45, 8-position modular jacks terminated at each end; length as indicated or as required.

2. Comply with TIA-568.2.
3. Wiring: T568B.
4. Plug Insertion Life: 750 times, minimum.
5. Flammability: Comply with UL 94.
6. Patch Cords for Patch Panels:
 - a. Quantity: One for each pair of patch panel ports.
7. Patch Cords for Work Areas:
 - a. Quantity: Four for each work area outlet port.
8. Products:
 - a. Part numbers specified include "XXX" in place of length.

2.4 FIBER OPTIC CABLE AND INTERCONNECTING DEVICES

A. Fiber Optic Cables:

1. Comply with TIA-568.3 and ICEA S-83-596; listed as complying with UL 444 and UL 1651.
2. Cable Applications:
 - a. Plenum Applications: Use listed NFPA 70 Type OFNP plenum cable.
 - b. Riser Applications: Use listed NFPA 70 Type OFNR riser cable or Type OFNP plenum cable.
 - c. General Applications: Use listed NFPA 70 Type OFN/OFNG general purpose cable, Type OFNR riser cable, or Type OFNP plenum cable.

B. Fiber Optic Connectors:

1. Comply with TIA-568.3, match cable.
2. Connector Type: Type LC unless otherwise indicated or required.

2.5 COMMUNICATIONS EQUIPMENT ROOM FITTINGS

A. Copper Panels:

1. Designed for mounting in 19-inch (480 mm) wide equipment racks complying with EIA/ECA-310 unless otherwise indicated.

2. Jacks: RJ-45, nonkeyed, 8-position modular jacks with insulation displacement connectors (IDC).
3. Comply with TIA-568.2, match cable; UL 1863 listed.
4. Include provisions for both T568A and T568B wiring configurations.
5. Plug Insertion Life: 750 times, minimum.
6. Flammability: Comply with UL 94.
7. Include provisions for front port labeling.
8. Provide rear cable management on back of panel.
9. Capacity: Provide total quantity of ports sufficient for cables to be terminated plus 25 percent spare.
10. Products:
 - a. SYSTIMAX 360 GigaSPEED XL 1100GS3 Evolve Category 6 U/UTP Patch Panel.
 - 1) 24-port, 1 RU high; P/N 760152561.
 - 2) 48-port, 2 RU high; P/N 760152579.
 - b. SYSTIMAX 360 GigaSPEED X10D 1100GS6 Evolve Category 6A U/UTP Patch Panel.
 - 1) 24-port, 1 RU high; P/N 760152587.
 - 2) 48-port, 2 RU high; P/N 760152595.

B. Fiber Panels:

1. Designed for mounting in 19-inch (480 mm) wide equipment racks complying with EIA/ECA-310 unless otherwise indicated.
2. Comply with TIA-568.3, match cable.
3. Flammability: Comply with UL 94.
4. Include provisions for front port labeling.
5. Provide rear cable management tray with removable cover on back of panel.
6. Provide dust covers for unused ports.

7. Products:

- a. CommScope Propel Series High Density Sliding Fiber Panels, accepts Propel Series Modules/Adapter Packs.

- 1) 1 RU high, up to 72 duplex LC ports, 72 MPO ports, or 144 SN ports; Model PPL-1U; P/N 760252002.

C. Equipment Racks:

- 1. Comply with EIA/ECA-310; 19 inches (480 mm) wide unless otherwise indicated.
- 2. Listed as complying with UL 2416.
- 3. Floor-Mounted Rack Material: Aluminum or steel.
- 4. Static Load Rating:
 - a. Provide racks and shelves with static load rating suitable for loads to be supported.
 - b. Floor-Mounted 2-Post Equipment Racks: 1,000 lb (460 kg), minimum.
 - c. Floor-Mounted 4-Post Equipment Racks: 2,000 lb (910 kg), minimum.

D. Horizontal/Vertical Cable Managers:

- 1. Compatible with specified equipment racks.

E. Cable Runways:

- 1. Provide complete cable runway system consisting of required components, fittings, supports, and accessories; routing as indicated or as required.
- 2. Material: Powder-coated steel.
- 3. Color: Black.
- 4. Side Rail Height: 1.5 inches (38 mm) for straight sections and flat bends.
- 5. Static Load Rating: 45 lb (20.4 kg), minimum.

F. Fiber Raceways:

1. Description: Raceway system specifically designed for routing and protection of fiber optic cables; suitable for overhead, under floor, and above ceiling applications.
2. Provide complete fiber raceway system consisting of required components, fittings, supports, and accessories; routing as indicated or as required.
3. Material: Thermoplastic; nylon and PVC are not acceptable.
4. Color: Yellow.
5. Span: 6 feet (1.8 m).
6. Joining Method: Mechanical; glue and solvents are not acceptable.
7. Plenum rated; listed as complying with UL 2024.
8. Flammability: Comply with UL 94.
9. Minimum Cable Bend Radius: 2 inches (50 mm) throughout system.

2.6 COMMUNICATIONS FACEPLATES

- A. Listed as complying with UL 514C.
- B. Compatible with specified modular jacks/inserts.
- C. Faceplates for Modular Furniture: Compatible with modular furniture raceway cover openings.
- D. Provide blank inserts/dust covers for unused ports.
- E. Faceplate Material/Finish - Flush-Mounted Outlets: High impact thermoplastic, color to be selected by Architect.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive system components.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

- A. Clean raceways to remove foreign materials before installing cables.

- A. Install products in accordance with manufacturer's written instructions.
- B. Comply with BICSI N1 and TIA-568 (SET).
- C. Cable Installation in Raceway:
 - 1. Do not damage cables or exceed manufacturer's recommended maximum pulling tension.
 - 2. Use wire-pulling lubricant recommended by manufacturer where necessary.
- D. Floor-Mounted Equipment Racks: Permanently anchor to floor in accordance with manufacturer's recommendations.
- E. Identify components in accordance with TIA-606.
- F. Provide grounding and bonding in accordance with TIA-607.

3.4 FIELD QUALITY CONTROL

- A. Provide equipment, tools, and supplies required to accomplish inspection and testing.
- B. Test copper twisted pair cables in accordance with TIA-568.2.
- C. Test fiber optic cables in accordance with TIA-568.3, TIA-526-7, and TIA-526-14.
- D. Provide additional testing as required by manufacturer for network infrastructure system warranty.

3.5 PROTECTION

- A. Protect installed structured cabling system components from subsequent construction operations.

END OF SECTION