

SECTION 271013 - STRUCTURED RESIDENTIAL CABLING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data, Shop Drawings, system schematic, floor plans with cabling point labeling, and cabling color scheme.
- B. Performance Requirements: Coordinate the features of materials and equipment so they form an integrated system complying with TIA/EIA-570-A. Match components and interconnections for optimum performance.
- C. Comply with NFPA 70, "National Electrical Code."
- D. Comply with TIA/EIA-570-A.
- E. DELETED**
- F. DELETED**

1.2 BASIS FOR REPLACEMENT

- A. **If the wire throughout is aluminum, the Contractor shall remove and replace with copper wire, in accordance with local and state building code.**
- B. If existing receptacles do not possess a third prong for grounding and polarization, the Contractor shall remove and replace with a three prong grounded receptacle provided the existing outlet is grounded.**

PART 2 - PRODUCTS

2.1 DISTRIBUTION DEVICE

- A. Description: Equipment to support network, including signal amplification, cross connects, network hubs, and service terminations.
 - 1. Auxiliary disconnect outlet and distribution device cords for telephone and television service.
 - 2. Cross-connect devices, patch panels, cable termination devices, and accessories shall meet the data transmission speed and bandwidth of the associated cabling.
 - 3. Comply with TIA/EIA-570-A, Grade 1 service standard.
 - 4. Comply with TIA/EIA-570-A, Grade service standard noted on Drawings.
- B. Telephone: lines from the exchange access provider; with cross-connect device to enable the selection and pairing of incoming lines with outlet lines.

1. Place outlet cabling in a star topology.
 2. Branch outlets required in each bed room, kitchen and living room.
 3. Cross Connect: Modular, IDC-type, cross-connect device with modules designed for punch-down caps or tools.
 4. Provide space for installation and connection of an ADSL gateway distribution device furnished by access provider.
- C. Television: Distribution device shall have space for **CATV** lines, and distribute in-home generated video and radio-frequency sources.
1. Place outlet cabling in a star topology.
 2. Branch outlets required in each bed room, kitchen and living room and den for available TV or internet services.
 3. Provide space for installation of signal amplification and conditioning.
 4. Distribute in-home generated video sources to same outlet as cable television service.
 5. Accommodate the installation and connection of a cable gateway distribution device furnished by access provider.
- D. Speaker Cable: Cross-connect panel with number of speaker cables connected to distribution device, plus 25 percent (if installed).
- E. Equipment Enclosure: Modular with equipment mounting rails to accept all specified components; 14-1/2 inches wide, suitable for mounting between studs.
1. Mounting: Surface, Flush or Semi-flush.
 2. Door: Hinged, lockable.
- F. Power Outlets: UL 1449; cabinet mounted, with one 15-A, 120-V ac, NEMA WD 6, Configuration 15-15R receptacle(s), with surge protection, and including the following:
1. LED indicator lights for power and protection status.
 2. Peak Single-Impulse Surge Current Rating: 26 kA per phase.
- G. Incoming Telephone Line Surge Protection: UL 497; cabinet-mounted, dial-up line surge suppressor for each line.
1. Working Voltage: 200 V.
 2. Maximum Clamping Voltage: 270 V.
- H. Incoming Television Line Surge Protection: Cabinet-mounted, coaxial cable surge suppressor for each cable, 0.3-dB maximum insertion loss at 5 to 1000 MHz. Rated for maximum surge current of 5000 A.

2.2 CABLE

- A. UTP Cable: Comply with ANSI, EIA, TIA 568-B.2-1, No. 24 AWG, unshielded copper cable, Category 6, 100 ohms, 4 pair.
1. NFPA 70, Types CMG and CMP.

- B. Horizontal Fiber-Optic Cable: 2-fiber cable complying with TIA/EIA-455, tight buffer, 50/125.
 - 1. Number of Connectors per Field: One for each fiber of cable(s) assigned to field, plus spares and blank positions adequate to suit specified expansion criteria.
- C. Fiber-Optic Cable Connecting Hardware: Quick-connect, simplex- and duplex-, Type FC or Type ST coupler. Insertion loss not more than 0.7 dB.
- D. Series-6 Coaxial Cable: 75-ohm nominal impedance with a return loss of 20 dB maximum from 7 to 806 MHz.
 - 1. No. 16 AWG, solid, copper-covered steel conductor; gas-injected, foam-PE insulation. Double shielded with 100 percent aluminum-foil shield and 60 percent aluminum braid.
 - 2. Cable Connecting Hardware: Type BNC, 75 ohms.
- E. Combination Cables: Designed for home networking; may be used provided the requirements for single-cable types are met.
- F. Speaker Cables: 2-conductor cable, No. 14 AWG, UTP, PVC jacketed, UL Type CL3. Use two different jacket colors and a consistent conductor color.
- G. Security Device Cables: Multi-conductor, No 18 AWG, UTP, with red PVC jacket, and complying with NFPA 70, Type CL2 and TIA/EIA-570-A-1 requirements.
- H. Fire and Carbon Monoxide Warning Device Cables: Multi-conductor, No. 18 AWG, twisted pair, with red PVC jacket, and complying with NFPA 70, Type FPL and TIA/EIA-570-A-1 requirements.

2.3 RACEWAYS

- A. Nonmetallic Flexible Raceway and Fittings: UL 2024. One-piece, plastic, dual-voltage, two-gang box and bracket, with molded-in nailing flanges.
- B. Floor Boxes: Round, with partitions for power, data, and communication wire and cable. Thermoplastic covers.

2.4 WIRING DEVICES

- A. Modular; each outlet configuration field fabricated from factory-made components. Listed and labeled as complying with TIA/EIA-568-B.2, TIA/EIA-B.3, and UL 1863.
- B. Mount connectors on single or multi-gang faceplate.
 - 1. Faceplates: High-impact plastic. Colors shall be ivory or white.
 - 2. Outlet shall accept the following components:
 - a. Telephone and Data Jacks: IDC connector for UTP, modular, RJ-45.
 - b. MATV: Type F.
 - c. Voice: RCA type.
 - d. Speaker: Banana jack or Binding post type.

2.5 GROUNDING AND BONDING

- A. Materials: Comply with NFPA 70 and UL 467.

2.6 IDENTIFICATION PRODUCTS

- A. Comply with TIA/EIA-606-A and with applicable requirements in Division 27 Section "Common Work Results for Communications."
- B. Cable Labels: Self-adhesive vinyl or vinyl-cloth wraparound tape markers, machine printed with alphanumeric cable designations.

PART 3 - EXECUTION

3.1 DEMARCATION POINTS

- A. Contact access providers to locate demarcation points according to applicable regulations. Demarcation points shall be installed for the following:
 - 1. Telephone by AT&T or Comcast
 - 2. Television, AT&T or Comcast
- B. Comply with BICSI RNCM.
- C. Install fire stopping according to TIA/EIA-569-A.
- D. Ground equipment complying with ANSI-J STD-607-A.
- E. Raceway Installation:
 - 1. Install a vertical chase consisting of **two**, 2-inch nonmetallic conduits from distribution device to the attic and to an accessible space below the floor as applicable.
 - 2. Nonmetallic conduit shall not be installed in plenums or spaces used for environmental air.
- F. Cable Installation:
 - 1. Install exposed cable parallel and perpendicular to surfaces or exposed structural members and follow surface contours where possible.
 - 2. Make splices, taps, and terminations only at indicated outlets, terminals, and cross-connect and patch panels.
 - 3. Cold-Weather Installation: Bring cable to room temperature before de-reeling. Heat lamps shall not be used for heating.
 - 4. Secure and support cable at intervals not exceeding 30 inches and not more than 6 inches from boxes, outlets, and terminals.
 - 5. Install UTP cable using techniques, practices, and methods that are consistent with Category 6 rating of components and that ensure Category 6 performance of completed and linked signal paths, end to end.

- a. Do not untwist more than 1/2 inch of Categories 5e and 6 cable at connector terminations.
6. Install security device cable between the security system cabinet and the device as follows:
 - a. Two-Conductor Cable: Magnetic switches at doors and windows.
7. Install smoke and carbon monoxide warning device cable between the security system cabinet and the outlet as follows:
 - a. Four-Conductor Cable: Smoke detectors, combination strobe/horn appliance.
 - b. Install one detector per room and/or as required by code.
 - c. Install one carbon monoxide detector device adjacent to garage.
 - d. Devices must be hard-wired as described and be equipped with battery backup.
8. Protection against Physical Damage:
 - a. Install cabling and nonmetallic raceways complying with NFPA 70, "Wiring Methods" Article. All cabling in this Section shall comply with provisions for nonmetallic-sheathed cabling listed in that article.
 - b. Install insulated grommets or bushings when cable passes through openings in metal studs or enters boxes and cabinets.
 - c. Installing cable in shallow grooves, as described in NFPA 70, "Wiring Methods" Article, is not permitted.
9. Outdoor Coaxial Cable:
 - a. Outdoor connections shall be installed in enclosures complying with NEMA 250, Type 4X. Connectors shall be corrosion resistant with properly designed O-rings to keep out moisture.
 - b. Attach antenna lead-in cable to support structure at intervals not exceeding 36 inches.
- G. Wiring within Distribution Device:
 1. Group cable-connecting hardware into separate logical fields.
 2. Train conductors to terminal points with no excess.
 3. Use lacing bars to restrain cable, to prevent straining connections, and to prevent bending cable to smaller radii than minimums recommended by manufacturer.
- H. Separation from EMI Sources:
 1. Comply with TIA/EIA-570-A for separating telecommunication cabling from potential EMI sources, including electrical power lines and equipment. Comply with the following minimum separation distances from possible sources of EMI:
 - a. Power Lines or Electrical Equipment near Open Cabling or Cabling in Nonmetallic Raceways: 2 inches.
 - b. Electrical Motors and Transformers, 5 kVA or HP and Larger: 48 inches.
 - c. Fluorescent Fixtures: 5 inches.

2. Maintain electrical branch circuit conductors (line, neutral, and grounding wires) together by sheathing or bundling to minimize inductive coupling. 2 inches may be reduced if cabling crosses at right angles.
3. Install cabling in grounded metallic raceways where the required separation is not practical.

3.2 IDENTIFICATION

A. Cable and Wire Identification:

1. Label each cable within 4 inches of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
2. Each wire connected to building-mounted devices is not required to be numbered at device if color of wire is consistent with associated wire connected and numbered within panel or cabinet.
3. Within Connector Fields in Distribution Devices: Label each connector and each discrete unit of cable-terminating and connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.

- B. Cable Schedule: Post in distribution device. List incoming and outgoing cables and their designations, origins, and destinations. Furnish an electronic copy of final comprehensive schedules for Project.

3.3 FIRESTOPPING

- A. Fire stopping: Comply with requirements in Division 07, Section "Penetration Firestopping."
- B. Comply with TIA-569-B, Annex A, "Firestopping."
- C. Comply with BICSI TDMM, "Firestopping Systems" Article.

END OF SECTION 271013