

Part 1 – GENERAL

01.01 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including General and Supplementary Conditions and Division 1 Specifications sections, apply to work of this Section.
- B. This Section is a Division 17 Communications section and is part of each Division 17 Section making reference to the television system specified herein.

01.02 SCOPE OF WORK

- A. An unshielded twisted-pair (UTP), Category 6 certified cabling system shall be utilized for distribution of television signals from voice/data distribution closets to television outlets in classrooms and offices. The cabling system shall utilize baluns for conversion from coaxial to UTP cabling at distribution closets and from UTP to coaxial connection at television receivers. Distribution closets shall be fed via a coaxial cable backbone originating from a television headend (NIC) at the media center.
- B. Contractor shall furnish and install cables, distribution components, headend equipment, and all additional equipment necessary for a complete and operating system.
- C. Omission of express reference to any parts necessary for or reasonably incidental to a complete installation shall not be construed as releasing contractor from furnishing such parts.

01.03 DESCRIPTION OF WORK

- A. Cable distribution system shall include, but not be limited to:
 - 1. UTP category 6 cabling system including cabling, modular outlets and rack-mounted patch panels with patch cords
 - 2. Coaxial cable backbone from television headend to each communication closet.
 - 3. Coaxial signal splitter networks and distribution hubs for installation at communications closets.
 - 4. Category 6 workstation cables and attached baluns for final connections from room television outlets to TV receiver/monitors.
- B. Each room provided with television services shall be equipped with one (1) or more TV outlet locations. Each location shall be equipped with connectors for connection to a communication closet hub.

01.04 QUALITY ASSURANCE

01.05 SUBMITTALS

- A. Product Data.
- B. Shop Drawings.
- C. As-Built Drawings.
- D. Operating Instruction.
- E. In-Service Training.
- F. Warranty.
- G. Any system proposed as an equal ...

01.06 SYSTEM PERFORMANCE

- A. Definitions.
 - 1. Signal Sources
 - a. Home Subscriber Network (HSN) (CATV). HSN service is provided by the local cable TV company and will have fifty or more program channels on one (1) cable.
 - b. Institutional or Instructional Cable Network (ICN) (CATV). ICN service is provided by the local cable TV company and will have one or more program channels on one (1) cable.
 - c. Local Production Network (LPN). A function of the television system that allows the Owner to produce live television programs utilizing a portable studio cart or a fixed studio and distribute to all TV outlet locations.
 - 2. Locations.
 - a. Headend. Generally, the media center is the location of all the television electronic equipment for processing and amplification of the signal sources.
 - b. TV Studio (Portable). A rolling cart that can be wheeled from instructional location to instructional location and is one of several signal sources for the LPN. The studio allows live TV programs originating from cameras and microphones to be shown over the LPN.
 - c. Instructional Multimedia Location. Typically a wall chase or raceway located in a classroom or meeting room. The chase is equipped with wall plates that are connected to the TV distribution system and provide in-room audio/video service (IRS) to the television receiver/monitor located in the room.
 - d. Monitor Location. Typically offices, cafeteria, foyer, corridor or other non-instructional location that requires TV distribution but does not require IRS.
- B. Signal Sources
 - 1. Owner shall subscribe to the following TV signal sources:
 - a. HSN cable service from the local cable company. One (1) cable drop.

- b. Television headend and signal sources shall be provided under a separate contract/specification.
2. Cable distribution system is designed with the following wiring plan:
 - a. Distribution system as described in Article _____ of this Specification Section.
3. Systems shall meet the following performance parameters:
 - a. Signal levels at each TV outlet location shall be 0 dbmV \pm 10 dB for all channels from 7-410 MHz.
 - b. System response shall be \pm 1.5 dB within any channel.
 - c. Signal-to-noise ratio shall be greater than or equal to 43 dB at any TV outlet location.
 - d. Coaxial Distribution System shall be shielded (100+dB) to prevent radiation of the signals.
 - e. UTP Cabling Distribution System shall meet compliance requirements with FCC Part 15.

PART 2 – PRODUCTS

02.01 MATERIALS

- A. TV Distribution System Equipment. Furnish and install distribution equipment as specified and indicated in Detail Drawings.
 1. **Distribution Hubs:** Rack-mountable passive distribution hubs with 8 or 16 front mounts modular 8-pin jacks for connection to UTP 4-pair cabling, and “F” fitting on rear panel for connection to coaxial backbone cable. Hubs shall be tested compliant with FCC Part 15 requirements. Bandwidth: 5 – 860 MHz. Hubs shall be supplied with quantities of plug-in terminators to terminate all unused ports. Acceptable: Lynx Broadband passive hubs. Provide quantities of hubs necessary to provide individual hub connection port for each television outlet in the system (includes individual ports for both the high and the low mounted TV outlet in typical high/low classroom outlet configuration and all single TV outlets).
 2. **Port Terminators:** Provide plug-in hub port terminators in quantities as required to terminate any unused hub ports. Terminator shall have an integral 8-pin modular connector to plug into open hub port. Acceptable: Lynx Broadband model 040-0069.
 3. **Patch Panels:** Provide Category 6 rated patch panels for this system. Product shall be same as that specified in section 17745 of this specification. Provide quantities as required to provide a single patch panel port for each television outlet in the system.
 4. **Patch Cords:** Provide Category 6 rated patch cords for connections from distribution hubs to patch panels. Product shall be same as that specified under section 17745 of the specification, in quantities required to provide a single cord for each television outlet in the system.
 5. **Baluns:** Provide single-port converters (for use at TV outlet locations). Converter shall convert balanced line signal to coaxial unbalanced signal for connection to coaxial inputs of television receiver/monitors. Converter shall be equipped with integral 8-pin modular jack on one end and

male "F" fitting on the opposite end. Acceptable: Lynx Broadband part #040-0074. Provide quantities required to provide an individual converter for each TV outlet in the system.

6. Outlets: Provide modular 8-pin, Category 6 information outlets at all TV outlet wallplates. Product shall be same as that specified under section _____ of this specification.
7. Cabling:
 - a. Trunkline Cable. Type RG11/U, quad shielded with CL2P jacket. 14AWG copper covered steel or bare copper center conductor. Capacitance: 16.0 pF/ft. nominal; Attenuation per 100 ft. shall not exceed 6.5 dB at 1000 MHz. Acceptable: Commscope No. 2287, West Penn #25821, Belden #1153A.
 - b. Distribution Cable: Provide 4-pair, UTP, Category 6 cabling with plenum jacket, product as specified in section _____ of this specification.
8. RF Splitters. 2 or 4 way units, 5-1000 MHz bandwidth, minimum 100 dB radiation shielding. Acceptable: Blonder Tongue SCVS Series or prior-approved equal.

PART 3 – EXECUTION

03.01 INSTALLATION

- A. The Communications Contractor shall furnish and install complete system with all necessary parts and equipment. Necessary electrical work-such as wall and floor outlet boxes, conduit, surface raceways and/or cable tray systems, AC power circuits-shall be furnished and installed by Electrical Contractor. All cabling shall be furnished and installed by the Communications Contractor.
- B. All equipment shall be installed and connected in strict accordance with the manufacturer's recommended instructions.
- C. Any active electronic components provided with the system shall have equipment installed on the AC voltage supply to arrest damaging electrical transient and spikes, which can cause damage to the components of the system.
- D. Hubs and patch panels provided under the base bid shall be installed in allocated space in voice/data racks provided under section _____ of the specification. Refer to rack details sheet E912 for further information.
- E. Category 6 Distribution System from closet patch panels to outlets in classrooms/offices shall be completely tested and certified as a Category 6 link, using test equipment and methods a specified under Section _____ of the specification.
- F. All cabling shall be installed in a neat and workmanlike manner by operatives familiar with the television system. All cabling shall be in accordance with applicable codes and shall be concealed in conduit, raceways or suspended ceilings as indicated on the drawings. Cable run through conduit shall be carefully pulled to ensure cable is not kinked, crushed or abraded in any way. No splices shall be made in any cable run of less than 500'-0'. Each cable shall have a label firmly attached to each end for identification purposes.

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- G. All terminations shall be made in a neat and secure manner suited to the service of the cable. All terminations shall be labeled with adhesive labels with coding to identify the run involved that corresponds to line drawings of the system. Coaxial cable shall be terminated using Type F fittings. Fittings shall be sized to fit the cable. Follow the fitting manufacturer's instructions and use the tools recommended. Grounding shall be carefully accomplished to avoid danger of electrical potential on exposed metal surfaces, as well as induced interference on signal lines.
- H. Installer shall completely test all system functions and distribution lines. Levels at all outlets shall be tested for signal strength using a signal strength meter (Blonder-Tongue FSM-11 or equal). A standard receiver fed from the same outlets shall show no visible components of cross modulation or beat interference. At each outlet, signal strength shall be measured at lowest and highest frequency used in the system and results recorded and entered in manuals.
- The signal-to-noise ratio shall be tested at the last outlet on the longest branch by recording the signal strength of the picture carrier of each channel and then recording the readings at the same frequencies with the in put to the amplifiers terminated at 75 ohms. All readings of the above tests shall be recorded and entered in the manuals. Installer shall notify Engineer of the time for testing and shall conduct the tests in the presence of the Engineer if requested, rescheduling the tests if required.
- I. The specified equipment shall be supplied, installed, adjusted, tested and guaranteed by a factory-authorized, franchised television contractor for the products furnished. Contractor is responsible for verifying the completeness of the parts list and the suitability of the equipment to meet the intended purpose of the specifications and drawings.
- J. The Communications Contractor shall be prepared to offer a service contract for the maintenance of the system after the guarantee period. Contractor shall produce evidence that he has had a fully-experienced and established service organization for at least five (5) years and proven satisfactory installations during that time.