



## PART 1: GENERAL

### 1.01 SCOPE OF WORK

- A. Work covered by this section shall consist of furnishing labor, equipment, supplies, materials, and testing unless otherwise specified, and in performing the following operations recognized as necessary for the installation, termination, and labeling of grounding and bonding infrastructure as described on the drawings and/or required by these specifications.

### 1.02 RELATED SECTIONS

1. Division 26, Section 26 00 00 Electrical.
2. Division 27, Section 2700 00 Communications.
3. Division 28, Section 2800 00 Electronic Safety and Security.

## PART 2: PRODUCTS

### 2.01 GENERAL

- A. The materials and products specified herein reflect the minimum acceptable standards of fabrication and manufacturing. All materials and products supplied by the Contractor and specified herein are to be new, unused, of first quality and in original packaging or shipping containers or as shown on drawings and described in item 3.01.
- B. New buildings and major renovations will be treated differently than minor remodels in existing buildings.
- C. Match existing cabling systems and termination hardware for all adds moves and changes including voice and data unless directed otherwise by UNM IT, even those areas where separate voice and data closets are utilized.
- D. New building construction and renovations will utilize a minimum of Category 6 cabling and termination hardware or as directed by UNM ITS.
- E. Contact the UNM ITS/CNS for approval of cabling systems before installation. Verify exact cabling requirements with UNM ITS.

- F. UNM ITS/CNS to provide patch cords and make all connections to campus network and phone system.

## 2.03 DATA

A. Buildings requiring Category 6 cabling:

1. Single 4-pair, category 6, unshielded twisted pairs, 23 gauge, bare copper, polyethylene insulated conductors, with overall blue jacket, CMP (Plenum) rated.
2. The cable shall be equal to or better than Superior Essex performance spec. 66.
3. Approved Manufacturers and products shall be:
  - a. Superior Essex 66 cabling.
  - b. Berk-Tek as specified.

B. Buildings requiring Category 6A F/UTP cabling:

1. Single 4-pair, category 6A F/UTP, shielded twisted pairs, 23 gauge, bare copper, polyethylene insulated conductors, with overall blue jacket, CMP (Plenum) rated.
2. The cable shall be equal to or better than Superior Essex performance spec. 6S.
3. Approved Manufacturers and products shall be:
  - a. Superior Essex 6S cabling.
  - b. Berk-Tek. As specified.

## 2.04 VOICE

- A. All voice cabling will follow data cabling guidelines with either Category 6 or Category 6A F/UTP cabling as per section 2.02. Category 3 cabling is not to be installed for any application.
- B. For dedicated voice lines such as security/alarm panels, elevator phones, and code blue emergency telephones, cabling shall be terminated on a 110 block in the TR and *shall not be terminated* on the patch panel.

## PART 3: EXECUTION

### 3.01 General

- A. This section describes the installation locations for the products and materials, as well as methods and UNM IT standards associated with the structured cabling system installation portion of the project. These specifications, along with the drawings and other supplied documentation shall be followed during the course of the installation.
- B. The contractor is required to be currently listed as a registered Certified Installer and warranty provider. The contractor shall be an approved Contractor under UNM RFP
- C. Contractors shall provide personnel for Cabling and Infrastructure installations who are trained and certified by the manufacturer in the installation of the submitted products.
- D. The contractor is required to supply all necessary tools, equipment, accessories, safety equipment, protective clothing, etc., as customary for the craft and necessary for the installation.
- E. The contractor shall verify space and infrastructure requirements and outlet locations with UNM IT before starting cable installations and terminations.
- F. The contractor shall verify the cable type and jacket rating required with the responsible UNM IT Facilities Manager before starting cable installation.
- G. The contractor shall verify cable fill in pathways not to exceed 40% cable fill for new installations and not to exceed 60% cable fill in existing installations. The contractor is responsible for installation of additional pathways where additional cables to be added will exceed the 60% cable fill ratio as per Division 27, Section 27 05 28 Pathways for Communication Systems.

### 3.02: COPPER HORIZONTAL CABLING INSTALLATION

**Universal Cabling System - UCS:** The purpose of a UCS is to cable a building for information needs without knowing specifically what equipment will be utilized. A UCS is geared for long term sustainability and flexibility. A USC is a cabling system where voice, data, video, and other low voltage services are provided over the same cable media.

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Communications Copper Horizontal  
Cabling 27 15 13

- A. The copper horizontal cabling shall be terminated at the TR on patch panels as per specifications in Division 27, Section 271119 Communications Termination Blocks and Patch Panels, and at the work area Telecommunications Outlets (TO) as per Division 27, Section 271543 Communications Faceplates and Connectors.
- B. For older buildings with separate voice and data closets, voice designated cabling may be terminated on 110 style blocks or existing 66 style blocks where capacity exists. Check with UNM IT Facility Manager for specific instructions.
- C. For dedicated voice lines such as security/alarm panels, elevator phones, and code blue emergency telephones, cabling shall be terminated on a 110 block in the TR and *not* on the patch panel.
- D. Cabling such as video surveillance, building monitoring, card access, IP alarms etc... shall be installed and terminated on dedicated patch panels and a 4 post equipment rack for special systems.
- E. Where patch panels are mounted in equipment racks, equally distribute cables on each side using vertical wire management, and into the horizontal strain relief wire management so as not to exceed wire management fill capacity. The patch panel shall be split into two halves so that ports 1 thru 12 and 25 thru 36 feed from the same side and 13 thru 24 and 37 thru 48 feed from the opposite side. Leave a minimum 4 inches of slack at the patch panel for re-termination of cables. See Addendum 1.
- F. Cables are to be neatly dressed with Velcro tie wraps, and secured to the strain relief bars at the back of the patch panel. Cable ties are not allowed.
- G. All cables at the back of the patch panel are to be labeled as per Division 27, Section 27 05 53 Identification for Communication Systems.
- H. All cables need to be terminated sequentially in order by the station ID on the patch panel.
- I. All terminations are to use TIA T568B wiring standards.
- J. Maximum strip length shall meet the manufacturers' requirements.

- K. Dust caps are required to be placed over the terminated cabling at the back of the patch panel following manufacturers' specifications.
- L. Contractor is responsible to obtain and follow installation instructions for the approved products proper termination and wire management of cables on respective products.
- M. A minimum of 18 inches of slack shall be installed above the ceiling at the end of the conduit run and supported using a category compliant method adequate to permit installation and removal of device for inspection without damage to cable or connections.
- N. Provide a minimum of 10 feet of service loop cable at the TRs to be contained and routed in the cable tray. Do not coil the cable to achieve the service loop.
- O. Cable bends shall not be greater than that recommended by the manufacturer of the cable.
- P. Care shall be taken so as not to damage cable during the installation process and that manufacturer's pull tension specification is not exceeded.
- Q. Horizontal cable lengths including all slack must not exceed 295 feet. Contact UNM IT if this is not possible.
- R. Within TRs, cables shall be snugly wrapped using Velcro reusable cable ties, a minimum of every three feet for cable organization, and installed in a neat and workmanlike manner. Cable ties shall be tightened so as not to deform cable jackets and thus affect cable performance.
- S. Cable fill in pathways shall not exceed 40% cable fill on initial use, or 60% on subsequent installations.
- T. New TRs must be free from dust, dirt, and other foreign materials before the installation of any termination hardware or the termination of copper or fiber optic cables. The door to the telecommunication rooms must be closed during termination.

### **3.02: RELOCATION AND REMOVAL OF EXISTING TO's.**

- A. Where the relocation of an existing TO is required and the new location will allow the existing cables to reach, the cables may be disconnected and removed back to the pathway or raceway system for installation into the new TO. Relocation requires a retest

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Communications Copper Horizontal  
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of all affected cables and relabeling, if necessary, as per Division 27, Section 270553 Identification for Communication Systems.

- B. Where existing cables will not reach, new cables shall be installed as per section 3.02.
- C. Where the removal of existing TO's is required, the contractor shall remove the TO, any surface mount raceway, and cables back to the source.
- D. Upon removal or relocation of an existing TO, corresponding IBN and as-built information is required.

**3.04: CABLE TESTING:**

- A. Contractor shall notify the responsible UNM IT Facilities Manager before the start of testing. UNM IT personnel may accompany the contractor during testing for verification purposes.
- B. 100% testing of all cables is required.
- C. The horizontal cabling consisting of single 4-pair cable runs, including those designated for voice shall be tested for the relevant Category 6 or Category 6A F/UTP Permanent Link Test compliance.
- D. Contractor shall provide a copy of the test reports in electronic format, to the UNM IT Facility Manager.
- E. UNM IT may perform random verification testing as part of acceptance of all copper cable testing.

**3.05: EQUIPMENT INSTALLATION AND CABLE TERMINATIONS:**

- A. All equipment shall be installed in a neat and workmanlike manner, arranged for convenient operation, testing and future maintenance.
- B. The contractor shall employ manufacturer certified system installation technicians to meet warranty requirements and RFP.

- C. The contractor shall supply verification of experience and/or certifications for this type of work to the Architect and UNM IT Telecommunications Facilities for approval before performing any work.

**3.06: AS-BUILT INFORMATION:**

- A. Contractor shall provide one set of preliminary as-built information to UNM IT along with all test result information two weeks prior to occupancy or Substantial Completion whichever is first. Partial as-builts shall be submitted as cabling is completed. A final as-built shall be submitted with all corrections made a maximum of 30 days after cabling installation is complete.
- B. As-built information shall be in electronic format in the format originally provided to the contractor. Indicate location of all TOs, pathways, distribution cable trays, junction boxes, and all additions and deletions pertaining to telecommunications. Include correct TO labeling next to all telecom symbols.
- C. If construction drawings are not utilized, contractor shall provide all telecommunications location information on an accurate and scaled floor plan.

**3.07: SYSTEM WARRANTY REQUIREMENTS:**

- A. Contractor shall perform all labeling requirements and provide testing documentation for verification as described herein.
- B. Contractor shall submit cable records to reflect all moves, adds, and changes.
- C. Contractor shall provide floor plans showing locations of all telecommunication outlets and spaces.
- D. Contractor shall perform these requirements for category 6 and 6A F/UTP permanent link configurations and submit to the hardware manufacturer such paperwork and test results as necessary to obtain a minimum 20-year system performance guarantee to UNM as defined by the cable and hardware manufacturers. The 20-year minimum system warranty shall be provided to UNM ITS/CNS Facilities prior to final payment for this work.

**END OF SECTION**