

Communications

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The material below covers specific information we definitely want to be included in the contract documents and may not be a completed specification section. This material is to be highlighted in your preliminary submittals so it is easily found. If we don't see it we will ask you to point it out.

PART 1: GENERAL

The Contractor is held responsible to be familiar with the provisions contained herein and with other Sections of this Specification as applicable to the completion of the installation.

The approved vendor, designated agent or employee is held responsible to be familiar with the provisions contained herein and is assumed to possess the knowledge, manpower, and materials applicable to the completion of the installation.

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, testing and labeling of all telecommunications infrastructure as described on the Drawings and/or required by these specifications.

1.02 COMMUNICATION SECTIONS

- A. Division 27, Section 270526 Grounding and Bonding for Communication Systems.
- B. Division 27, Section 270528 Pathways for Communication Systems.
- C. Division 27, Section 270553 Identification for Communication Systems.
- D. Division 27, Section 271116 Communications Cabinets, Racks, Frames, and Enclosures.
- E. Division 27, Section 271119 Communications Termination Blocks and Patch Panels.
- F. Division 27, Section 271123 Communications Cable Management and Ladder Rack.
- G. Division 27, Section 271313 Communications Copper Backbone Cabling.
- H. Division 27, Section 271323 Communications Optical Fiber Backbone Cabling.
- I. Division 27, Section 271333 Communications Coaxial Backbone Cabling.
- J. Division 27, Section 271513 Communications Copper Horizontal Cabling.

- K. Division 27, Section 272133 Data Communications Wireless Access Points
- K. Division 27, Section 271523 Communications Optical Fiber Horizontal Cabling.
- L. Division 27, Section 271533 Communications Coaxial Horizontal Cabling.
- M. Division 27, Section 271543 Communications Faceplates and Connectors.

1.03 INTENT OF DRAWINGS AND SPECIFICATIONS

A. These Specifications, together with the Drawings accompanying them, are intended to depict the installation requirements necessary to support this Project. Contractor shall furnish materials shown and/or called for on the Drawings but not mentioned in the Specifications, or vice versa, that are necessary for the installation and support of communications cabling whether or not specifically called for in both documents. In addition, the Contractor shall provide incidental equipment and materials required for the completion of systems included in this contract whether or not specified or shown on the drawings.

1.04 DEFINITIONS

Bonding Conductor – BC: An insulated copper conductor that bonds the TMGB to the Service Equipment (power) Ground.

Telecommunications Bonding Backbone – TBB: An insulated copper conductor that bonds all TGB's to the TMGB.

Telecommunications Bonding Backbone Interconnecting Bonding Conductor – TBBIBC: An insulated copper conductor that bonds two or more TBB's together in a multistory building.

Telecommunications Grounding Busbar – TGB: A copper ground busbar installed in every TR and is bonded to the TMGB by the TBB. All metallic items in the TR's are connected to the TGB.

Telecommunications Main Grounding Busbar – TMGB: A copper ground busbar installed in the BDF or EDF and is bonded to the Service Equipment (power) Ground by the BC. Serves as a dedicated extension of the building grounding electrode system for telecommunications.

Building Distribution Frame – BDF: The BDF is designated as the point where the outside plant cable terminates on the building entrance terminal (first level backbone). These Building entrance terminals include provisions for optical fiber/twisted-pair cabling coming from the campus telephone switch facility where the Main Distribution Frame (MDF) is located.

Intermediate Distribution Frame – IDF: A frame, rack or termination block that connects to the BDF with copper and optical fiber riser cables and distributes horizontal wiring to the rooms (Second Level). In some situations, a BDF may serve this function.

Telecommunications Outlet – TO: The standard telecommunications outlet. A connecting device in the work area on which horizontal cable or outlet cable terminates. This outlet is typically provisioned with four ports (maximum capacity is six ports) of either Category 5E or Category 6 Augmented cables and typically terminates in a designated Telecommunications Room (TR) at an IDF patch panel.

Protector: A device used to protect facilities from and equipment from abnormally high voltages or currents.

Outside Plant: Telecommunications infrastructure designed for installation exterior to buildings.

Riser Cable: Telephone, data, video, coaxial and other structured cabling system cables extending vertically (or horizontally, in some cases) between the BDF and each area IDF to support low voltage systems.

Horizontal Cable: The cabling between and including the work area telecommunications outlet/connector and the horizontal cross-connect/patch cord in the telecommunications room. This is typically a Category 5E or 6 Augmented 4 pair cable, but can also include multiple fiber cables for the desktop, coaxial cables and other multi media type cables that provide service to a end user device.

Inter Building Cable Plant: Outside plant cable or infrastructure connecting two or more buildings together for the distribution of telephone, data, video or control signals.

Intra Building Cable Plant: Inside cable plant or infrastructure within a building for the distribution of telephone, data, video or controls signals.

Approved / Approval: Written permission to use a material or system by University of New Mexico (UNM) IT/Telecommunications.

Should: A recommended best practice, procedure, or method.

Shall: A required practice, procedure or method.

Backbone: A facility (e.g., pathway, cable or conductors) between telecommunications rooms, or floor distribution terminals, the entrance facilities and equipment rooms within or between buildings.

Backbone Cabling: Cabling and connecting hardware that provides interconnections between telecommunications rooms, equipment rooms, and entrance facilities.

Connector (Jack): A female telecommunications connector that may be keyed or unkeyed and may have six or eight contact connector that may be positions, but not all the positions need to be equipped with jack contacts. Jacks are typically used to terminate cable at the user end and are inserted into faceplates to create a connection point for the user's equipment cord.

Electromagnetic Interference – EMI: Radiated or conducted electromagnetic energy that has an undesirable effect on electronic equipment of signal transmission.

Equipment Room (ER): An environmentally controlled centralized space for telecommunications that houses a main or intermediate cross-connect.

An ER can contain equipment to support all of the following: entrance protection, cable infrastructure pathway, data and voice services, PBX, demarcation point, wireless, paging, fire /smoke detection, security alarm systems, radio, area of rescue assistance equipment, CATV and video conferencing.

Furnish: Supply and deliver to installation location.

Install: Mount and connect equipment and associated materials ready for use.

Private Branch Exchange – PBX: A private telecommunications switching system.

Provide: Furnish, install and connect ready for use.

Pull Point: - A Pull Point is a space use to transition between floors for backbone and horizontal cabling within a building riser system.

Structured Cabling System: The complete collective configuration of a telecommunications cabling and associated hardware at a given location.

Telecommunications: A branch of technology concerned with the transmission, emission, and reception of signs, signals, writing, images, and sounds; that is, information, of any nature by cable, radio, optical, or other electromagnetic systems.

Telecommunications Room (TR): A TR is a special purpose room designed to serve a single floor. In buildings with multiple floors, TR's shall be vertically stacked to form a backbone pathway. The TR is the point in the voice and data infrastructure that the backbone and horizontal distribution systems are connected to each other. A TR can

contain equipment to support all of the following: cable infrastructure, data and voice communications, wireless (satellite), paging, fire /smoke detection, security alarm systems, radio, area of rescue assistance equipment, CATV and video conferencing.

Universal Cabling System (UCS): A UCS attempts to wire a building for information needs without knowing specifically what equipment will be utilized. A UCS is geared for long-term stability and flexibility and is based on the idea of wiring a building once.

Wireless Access Point (WAP or AP): Wireless access points are specially configured nodes on wireless local area networks (WLANs). Access points act as a central transmitter and receiver of WLAN radio signals.

Power Over Ethernet (POE): Power-over-Ethernet (PoE) or "Active Ethernet" eliminates the need to run 110/220 VAC power to Wireless Access Points and other devices on a wired LAN. Using Power-over-Ethernet system installers need to run only a single CAT5 Ethernet cable that carries both power and data to each device. This allows greater flexibility in the locating of AP's and network devices and significantly decreasing installation costs in many cases.

Voice Over Internet Protocol (VoIP): VoIP (Voice over Internet Protocol) is the transmission of voice traffic over IP-based networks.

1.05 Acronyms

AMPE	Architectural, Mechanical, Plumbing, Electric
PBX	Private Branch Exchange (Phone Switch)
ER	Equipment Room
TR	Telecommunications Room
EMI	Electromagnetic Interference
PP	Pull Point
PB	Pull Box
CAT	Category
UTP	Unshielded Twisted Pair
CATV	Community Antenna Television (cable television)
TGB	Telecommunications Grounding Busbar
TMGB	Main Telecommunications Grounding Busbar
AFF	Above the Finished Floor
MH	Maintenances Hole
HH	Handhole
TO	Telecommunications Outlet
WAP	Wireless Access Point
UTP	Unshielded Twisted Pair

Also see “Normative references” for additional codes, standards, acronyms, definitions, and examples.

The BICSI Telecommunications Dictionary is available for purchase at:
<http://www.bicsi.org/>

1.06 Symbols:

A list of telecommunications industry symbols that should be used in developing project documents is available on line at the BICSI web site at:

[http://www.bicsi.org/Resources/Dictionary/Symbols.pdf -
search='Telecommunications%20symbols'](http://www.bicsi.org/Resources/Dictionary/Symbols.pdf-search='Telecommunications%20symbols')

1.07 Normative References

The following organizations publish telecommunications construction standards with provisions that, through reference in this text, constitute provisions of this Document. At the time of publication of this Document, the editions of the standards published by the organizations indicated were valid. Designers and/or installers of telecommunications and networking services at the University of New Mexico must adhere to the telecommunication standards published by the these organizations, all standards are subject to revision; parties to agreements based on this Document shall apply the most recent editions of the standards published by the organizations indicated.

Federal Communications Commission (FCC)
Institute of Electrical and Electronics Engineers, Inc (IEEE)
National Fire Protection Association (NFPA)
National Electrical Safety Code (NESC)
American National Standards Institute (ANSI)
Telecommunications Industry Association (TIA)
Electronic Industries Alliance (EIA)
Building Industry Consulting Service International (BICSI)

1.07 Applicable Standards and References

The following list of methods and standards included in the Normative References are considered part of this specification. This is a list of primary references and does not limit the applicability of other standards that are incorporated into the list of Normative References applicable to the work described in these specifications. They incorporate generally accepted communications infrastructure practices described in Standards documents (and addenda) published by recognized standards bodies and organizations. These include standards published by the Telecommunications Industry Association/Electronics Industries Alliance (TIA/EIA) and Building Industry Consultant Services International (BICSI).

. ANSI/TIA/ EIA 568B, *Commercial Building Telecommunications Cabling Standard*

This prescribes the requirements for Intrabuilding copper and optical fiber cable performance, installation and testing.

. ANSI/TIA/EIA 569B, *Telecommunication Standard for Pathways and Spaces*

This standard includes specifications for the design and construction of pathways and spaces within buildings required to support information technology equipment and cable media.

ANSI/TIA/EIA 607, *Commercial Building Grounding and Bonding Requirement*

This document includes the components of an effective grounding system for communication systems within public and commercial buildings.

ANSI/TIA/EIA 758, *BICSI Customer Owned Outside Plant Telecommunications Cabling Standard*

This standard provides specifications for Interbuilding communication facilities that include cable media, pathways and spaces.

. ANSI/TIA/EIA 862, *Building Automation Systems Cabling Standard for Commercial Buildings*

This standard describes the generic cable system for building automation systems (BAS) that are intended to support a multi-product, multi-vendor automation environment within public and commercial buildings.

. Building Industry Consulting Services International (BICSI) *Telecommunications Distribution Methods Manual, 10th Edition*

This is a manual of proven design guidelines and methods accepted by the telecommunications industry.

. ANSI/NFPA 70, *National Electrical Code, (NEC) Current Edition*

In addition to standards related to electrical safety, the NEC has several sections that specifically address low voltage cable installation.

PART 2: PRODUCTS

2.01 PRODUCT STANDARDS

A. All materials shall conform to the current applicable industry standards including, but not limited to:

1. NEMA (National Electrical Manufacturers' Association)
2. ANSI (American National Standards Institute)
3. ASTM (American Society for Testing and Materials)
4. ICEA (Insulated Cable Engineers Association)
5. IEEE (Institute of Electrical and Electronic Engineers)
6. National Electrical Safety Code
7. Telecommunications Industry Association (TIA)
8. Electronic Industries Alliance (EIA)

B. In addition, all Material shall be Underwriters Laboratories Listed unless otherwise indicated.

C. All products must be new.

D. Product substitutions shall be managed according to the following guidelines:

- a. Where specified only by reference standards, select any product meeting standards by any manufacturer.
- b. Where specified by naming several products or manufacturers, select any product and manufacturer named that meets the specified requirements. Other products and manufacturers will not be considered.
- c. Where specified by naming one or more products or manufacturers, but indicating "or equivalent" after specified listing, the specified product is the preferred quality standard. The Contractor may submit a request for another product for acceptance.
- d. Where specified by naming only one product and manufacturer: "There is no option and no substitution" will be allowed.
- e. Submit requests for substitutions within 10 days of contract award, or sooner if required to maintain the construction schedule.
- f. The Contractor must submit sufficient information to show that a proposed substitute is equivalent to the item specified.
- g. Acceptance of substitutions is at Owner's discretion: the Owner reserves the right to determine suitability of the substitute product and reject any and all materials submitted for substitution.
- h. All substitute products and materials must be approved for substitution by the Owner in writing prior to installation.
- i. Products rejected or otherwise judged unsatisfactory by the Owner will not be authorized for use in completing the Work.. Any unapproved products discovered as part of the installation will be removed and replaced with Owner-specified and approved products at the Contractor's expense.
- j. Project Drawings may be based on equipment configuration of a particular manufacturer. If a substitution is approved, the Contractor shall make changes needed to accommodate the substitution at no expense to the University of New Mexico, including work under other divisions.

PART 3: EXECUTION

3.01 TELECOMMUNICATIONS INSTALLATION

A. Each Contractor shall be knowledgeable of work to be performed by other trades and take necessary steps to integrate and coordinate their work with other trades.

B. The Contractor shall be responsible for furnishing all materials on the drawings or as specified herein for a complete telecommunications system.

- C. All telecommunications infrastructure shall be installed in an aesthetically pleasing fashion.
- D. All telecommunications infrastructure shall be installed for optimal performance.
- E. All telecommunications infrastructure shall be installed for easy moves, adds, and changes in the future.
- F. All work performed in occupied spaces shall be in a manner that allows the owner to operate the existing facilities on a continuous basis.
- G. All user outages, including wireless access points, shall be submitted to the UNM IT/Telecommunications Department for approval two week before starting work that will affect user connectivity.
- H. New TR's 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
- I. Each contractor is to provide a Manufacturers Warranty of not less than 20 years on structured cabling systems.
- J. All work by the contractor must comply with the manufacturer's product recommended installation instructions and warranty requirements.
- K. All work by the contractor must comply with the standards listed in the Normative and Applicable Standards listed in this specification.
- L. The contractor is required to obtain all permits from the proper jurisdiction for all work associated with this specification.
- M. The Contractor is to provide to ITS/Telecommunications all station documentation and test results at the substantial completion.

End of Section