

Telecommunications Infrastructure Policy

Version 3.2
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MIDDLE TENNESSEE STATE UNIVERSITY
Information Technology Division

1. OVERVIEW, SCOPE AND PURPOSE

- 1.1. To Designers: The telecommunications cabling infrastructure is vital to the on-going provision of voice and data services to Middle Tennessee State University (MTSU). MTSU's telecommunications cabling infrastructure includes multimode and singlemode optical fiber, multipair copper trunks, Category 6 and Category 5e station copper cabling, conduit, telecommunications rooms, and riser systems. Designers shall be aware that existing cabling is not always enclosed in conduit systems. Existing cabling may be directly buried, or in buildings, be loose laid above ceilings, in chases, in raceways, in HVAC plenums or surface mounted. This policy primarily addresses Designers contracted to do state work. MTSU users are addressed in Article 13.
- 1.2. The University has spent a considerable amount of money, time, and effort constructing and implementing the cabling infrastructure. In order to ensure that the cabling infrastructure will serve the University well for the long-term, this asset shall be properly managed. Since the cabling infrastructure shall serve ever-increasing numbers of applications (voice, data, and video), improper use can waste this resource, prevent future connectivity or certainly make future applications more expensive. A video coaxial cable plant also exists on campus but is not considered herein.
- 1.3. The Information Technology Division has established standards for voice and data communications cabling. The documented standards are available from the Information Technology Division upon request and are to be part of any bid package for new construction or major renovation on campus. Designers shall apply the documented standards uniformly and consistently throughout the campus to provide the campus with the maximum flexibility to change and upgrade telecommunications technologies.
- 1.4. The growing demand for new telephone instruments, data communication, connectivity, and electronic access to resources continues to drive infrastructure improvements. New telecommunications rooms and riser conduit have become a normal part of any new construction or major renovation project. Consider the telecommunications infrastructure as a vital and limited resource. As such, guard it and manage it to insure availability for its intended uses.
- 1.5. The purpose of this document is to put forth policies for the management of the telecommunications infrastructure in order to:
 - help insure up-to-date telecommunications services and data connectivity for all departments
 - support technological growth throughout the University in an efficient and cost effective manner
 - position the University to take advantage of future technological innovations as they become available and proven.
- 1.6. The Information Technology Division is responsible for oversight of the design, planning, and management of the telecommunications infrastructure. Designers shall direct all inquiries regarding installation or use of the telecommunications infrastructure to the Information Technology Division. The following is a list of current contacts at MTSU.

Middle Tennessee State University
Information Technology Division
Cope 003
Murfreesboro, TN 37132

Prime Contact:

Lucinda T. Lea, Vice President for Information Technology and Chief Information
Officer

(615) 898-2512 Fax (615) 898-5720

lea@mtsu.edu

Greg Schaffer, Director of Network Services

(615) 898-5753 Fax (615) 898-5720

schaffer@mtsu.edu

Chris Piety, Assistant Director of Network Services

(615) 898-5973 Fax (615) 898-5720

cpiety@mtsu.edu

Stephen Prichard, Director of Telecommunication Services

(615) 898-2561 Fax (615) 898-2018

prichard@mtsu.edu

David Senior, Assistant Director for Telephone Systems

(615) 898-2990 Fax (615) 898-2018

djsenior@mtsu.edu

2. SPECIFICATIONS AND STANDARDS

- 2.1. Specifications and standards for the telecommunications cabling, wiring, and conduit are maintained and distributed by the Information Technology Division and are titled “Section 27100 – Cable Plant.”
- 2.2. Section 27100 – Cable Plant is part of the University’s *Architectural/Engineering Design Guidelines* and is to be part of any bid package for new construction or major renovation on campus.
- 2.3. Use Section 27100 – Cable Plant as the basis for all new telecommunications services. Edit appropriately and include Section 27100 in the construction specifications for all new building construction and major building renovations.
- 2.4. The Architect shall engage a Registered Communications Distribution Designer (RCDD) to conduct plan reviews whose purpose is to ensure that the communication system physical infrastructure as designed either meets or exceeds both industry and MTSU standards (Section 27100 - Cable Plant). The RCDD shall review all pertinent documents during Schematic, Design Development and Construction Document phases of the project to determine that such infrastructure neither conflicts with nor impedes any other building system or other element of construction. The communication system physical infrastructure includes, but is not limited to, all of the conduits, communication room(s) and pathways for cabling. Ten copies of each report are to be provided to the Architect. Provision of these review services shall prohibit the consultant from participating in activities related to construction or occupancy of this project.
- 2.5. Designers shall enlist a Registered Communications Distribution Designer (RCDD) consultant for review of plans as related to the communications systems. The RCDD will review all documents necessary during the Schematic, DDP, and CDP phases of project design to determine that the communication system physical infrastructure as designed meets or exceeds industry and MTSU standards (Section 27100 – Cable Plant) and does not interfere with or is not impeded by any other building systems or other elements of construction. The communication system physical infrastructure includes, but is not limited to, all of the conduits, communication rooms, and pathways for cabling. Provide 10 (ten) copies of the final report. Provision of these services prohibits the consultant from participating in activities related to construction or occupancy of this project.
- 2.6. Designers shall instruct contractors to remove and correct all new cabling and infrastructure work performed by contractors not in compliance with Section 27100 – Cable Plant at no additional cost to the University.
- 2.7. A copy of the latest revision of Middle Tennessee State University Information Technology Division Section 27100 – Cable Plant can be obtained by contacting:

Information Technology Division, Director of Network Services -- 615 898-5753.

- 2.8. Section 27100 – Cable Plant is designed to work in concert with and is not intended to supercede any industry standards or any local, state, or Federal laws. Designers shall communicate conflicts or discrepancies between Section 27100 – Cable Plant and other recognized standards to the Information Technology Division for resolution. Contractors shall adhere to all building codes and installation standards. The most recent publication of the highest standard will be applied.

3. MANAGEMENT AND USE OF TELECOMMUNICATIONS CABLING SYSTEM

- 3.1. The Information Technology Division is responsible for the management and use of all telecommunications cabling systems on campus, to include cabling, terminators, pedestals, and other system equipment. Moves, adds, and changes must be arranged through the Information Technology Division.
- 3.2. Only low-voltage copper cable and fiber optic cable networks will be accepted. The primary uses of telecommunications cabling are voice and data communication.
- 3.3. All new cable and infrastructure will be engineered and installed under the auspices of the Information Technology Division to accommodate all the University's networking requirements. For example, a building may have to provide a node to support other buildings in the area. For those such buildings MTSU may require four four-inch conduits buried in concrete, and a 72 strand fiber (24 multi-mode 48 single-mode). For edge buildings, buildings that MTSU never will hook into to provide network feed to another building, the University may specify a 12/12 fiber and a trace wire directly buried or in conduit directly buried instead of in conduit buried in concrete.
- 3.4. The Telecommunications Services department of the Information Technology Division manages all copper trunks, risers, and voice connectivity while the Network Services department manages all fiber trunks, risers, and data connectivity. In cases where there is crossover, the physical medium dictates responsibility, not its use.

4. MANAGEMENT AND USE OF RISER SYSTEMS AND TELECOMMUNICATIONS ROOMS

- 4.1. The Information Technology Division is responsible for the management and use of all communication riser systems on campus. These riser systems are primarily for voice and data communications and will not be used for any other purposes or by any other party without the express written permission of the Information Technology Division.
- 4.2. Contractors shall label all cables in the telecommunications rooms. Any cables that are not labeled will be assumed to be non-compliant and Contractors shall remove them per Section 2.5 of this document.
- 4.3. Designers shall indicate in bid documents that all telecommunications rooms such as those housing main distribution frames, nodal distribution frames, building distribution frames, intermediate distribution frames, and the Information Technology Division voice and data locations will be locked. Refer to the *Architectural/Engineering Design Guidelines*.

- 4.4. The telecommunications rooms, trunks and/or risers are solely for the use of the Information Technology Division in its provision of voice and data services. Other than code mandated communications devices, any discretionary non-regulatory use of the telecommunications rooms and/or risers (e.g., video, security, fire alarm, HVAC, etc.) will be at the sole discretion of the Information Technology Division and based on:
- the availability of space and/or capacity (present and anticipated use)
 - alternatives available for the provision of such services
 - assurances that other such use will not interfere with the proper functioning of voice and data services for the university.
- 4.5 Include code mandated communications device requirements in bid documents and all additions and/or modifications to the telecommunications rooms, trunks, and/or risers, internal and/or external to buildings necessary to provide for these requirements.

5. MANAGEMENT AND USE OF TELECOMMUNICATIONS CONDUIT

- 5.1. The Information Technology Division is responsible for the management and use of all telecommunications conduit on campus. These conduits may not be used for any purpose without the express written permission of the Information Technology Division.
- 5.2. Requests for conduit space shall contain the access path desired, the specific goal of the installation, the medium to be utilized (i.e. fiber optics, coaxial cable, etc.) and the type of signaling to be transmitted (audio, video, etc.)
- 5.3. The telecommunications conduit has been installed to support low-voltage copper cable and fiber optic cable installations exclusively. The telecommunications conduit is primarily for voice and data communication.
- 5.4. All approved installations will require supporting documentation in machine-readable format.
- 5.5. Inquiries about use of or access to the telecommunications conduit shall be directed to the Information Technology Division, Telecommunication Services, Assistant Director for Telephone Systems at 615 898-2990.

6. MAINTENANCE AND REMOVAL/RE-ROUTE OF THE TELECOMMUNICATIONS CONDUIT

- 6.1. Maintenance of the buried telecommunications conduit system (including ducts and manholes) shall be performed only with the approval of the Information Technology Division.
- 6.2. Removal/re-route of conduit shall be accomplished only after proper notification has been received from the appropriate University authorities, government agencies, or utilities and then only with the express written approval of the Information Technology Division.

- 6.3. The Information Technology Division will make every effort to work with the appropriate party/parties to quickly come to agreement on design and cost details.

7. PLANNING AND BUDGETARY COST

- 7.1. Because of the vital nature of voice and data communication to all University departments, Designers shall keep the Information Technology Division apprised of planning on all new utility and building construction and major renovations.
 - 7.1.1 When a project is approved and before commencing work on the project, Designers shall provide the Information Technology Division with a copy of project's complete schedule timeline.
- 7.2. The Information Technology Division will provide budgetary cost figures for the initial discussion and planning of projects. Pricing estimates will be made based on standard or average rates and the available information regarding the project's size, purpose, and location.
- 7.3. After a project is clearly defined and specific requirements are identified the Information Technology Division will provide budgetary cost figures for all viable options for the design and construction of the telecommunications conduit, cabling, and equipment. All telecommunications requirements, including but not limited to telecommunications rooms and node centers, will be identified along with inside and outside cabling concepts. The funding agency or department and MTSU Campus Planning Department will decide the option to use.
- 7.4. Whenever telecommunications and data work are part of a project, the Designer shall provide the Information Technology Division bid documents relevant to the telecommunications cabling infrastructure installations/upgrades/changes for review before bids are advertised and awarded.

8. CONSTRUCTION MANAGEMENT AND IMPLEMENTATION OVERSIGHT

- 8.1. The Information Technology Division Network Services and Telecommunications Services departments will observe the cabling and infrastructure portions of all major construction/installation projects.
- 8.2. The Information Technology Division will notify all appropriate parties regarding known deviations from Section 27100 – Cable Plant and other applicable Contract Documents for the telecommunications cabling infrastructure.
- 8.3. The MTSU Project Manager shall insure that the Information Technology Division representatives are invited to attend all final tests and the punch list walk throughs with the contractor.

9. EMERGENCY SERVICES FOR MTSU USERS

- 9.1. University personnel and/or its contractors, subcontractors, or utility companies operating on University property or in secured utility easements will immediately notify the Information Technology Division of any damage to the University telecommunications cabling infrastructure.
- 9.2. The Information Technology Division will work closely with the affected departments, contractors, network service providers, utilities, etc. as appropriate, to execute repair and recovery procedures to insure the minimum loss of communication service. If telecommunication links have been interrupted, the Information Technology Division will be in control of the repair technique and the actual repair. At the Information Technology Division's discretion, the Information Technology Division may ask the involved contractor or utility to assist with tasks that they readily have qualified personnel and supplies to perform.
- 9.3. The Information Technology Division will be responsible for contracting cabling companies to provide emergency services that are beyond the the Information Technology Division staff's capabilities.

10. POLICY EXCEPTIONS

- 10.1. Any request for an exception to this policy shall be addressed in writing to the Vice President for Information Technology and Chief Information Officer stating both the nature and the necessity of the exception.
- 10.2. The Information Technology Division will determine the viability of the request and make a determination on any appropriate exception to policy. Exceptions to policy will be made on a case-by-case basis and documented in writing. The granting of an exception for any given case shall not constitute a precedent.

11. TENNESSEE ONE-CALL

- 11.1. Designers shall indicate in their bid documents that MTSU is a member utility participating in the Tennessee One-Call System. Contractors shall call Tennessee One-Call before digging. MTSU Facilities Services is the University's point of contact with Tennessee One-Call. Locate tickets received at Facilities Services are copied and forwarded to the Assistant Director for Telephone Systems. The Information Technology Division assumes the responsibility of responding to locate tickets for voice, data, and video facilities managed by the Information Technology Division.
- 11.2. For more detailed information regarding legalities and liabilities of digging see Tennessee State Law, Chapter 31, Underground Utility Damage Prevention Act, as amended by Tennessee Public Charter 223.
- 11.3. Upon notice of damaged telecommunications facilities, the Information Technology Division will determine if the Contractor used the Tennessee One Call System for the location in which the damage occurred, and if the Information Technology Division had marked the location of the damaged facility.

- 11.4. The Information Technology Division will seek reimbursement for direct repair cost when the damaging party has not complied with State law or has damaged marked facilities.

12. DESIGN AND CONSTRUCTION STANDARDS FOR DESIGNERS

- 12.1. Drawings: Designers shall follow the suggested CAD layering, line styles, and symbols as indicated in the BICSI TDM Manual, 9th Edition, Chapter 14, Design, Construction, and Project Management, Appendix A. BICSI can be found on the web at www.bicsi.org. Designers shall use the BICSI suggested drawing types as indicated in Appendix B of the TDM Manual. The following list of T-series drawings is excerpted from that manual:
- T0 – Campus or Site Plans : Exterior pathways and interbuilding backbones
 - T1 – Layout or Complete Building per Floor: Serving-zone boundaries, backbone systems, and horizontal pathways.
 - T-2 – Serving Zones Drawings: Drop locations and cable identifies (IDS).
 - T3 – Communications Equipment Rooms: Plan views, telecommunications, architectural, mechanical, electrical, and plumbing (AMEP)/elevations – racks and walls.
 - T4 – Typical Detail Drawings: Faceplate labeling, firestopping, Americans with Disabilities Act (ADA), safety, Department of Transportation (DoT), etc.
 - T5 – Schedules (cabling and equipment spreadsheets) for cutovers.
- 12.2. Specifications: For those specifications not currently in the MTSU standards, Designers shall organize new specifications based on procedures and formats established by the Construction Specifications Institute (CSI), including SectionFormat and PageFormat. CSI is available on the web at www.csinet.org. Further, Designers shall organize specifications for this work in Division 27 – Communications.
- 12.3 Consultants: When called upon by Project Complexity or if directed by MTSU, Designers shall hire a consultant trained and certified in telecommunications infrastructure. Minimum qualifications for consultants will be a person who has 5 years experience and has achieved the RCDD (Registered Communications Distribution Designer) from BICSI. Optionally, project specifications can require the Contractor’s shop drawings and other submittals to be prepared by a similarly qualified, RCDD certified individual.
- 12.4 Close Out Documents: Designers shall require contractors to furnish hard copy record drawings, so-called “as-builts,” at project occupancy (Substantial Completion). Designers shall transfer contractor’s marks to electronic copies of contract drawings and deliver revised drawings to MTSU both in electronic and hard copy formats not later than 30 days after Substantial Completion. Designers shall require contractors to furnish one copy of telecommunications infrastructure operation manuals and technical documentation for MTSU use. Contact information for product vendors shall include vendors’ email and web site addresses.
- 12.5 Workstations (Port Counts): Design the station outlet to serve a variety of current communications needs and provide sufficient flexibility and adaptability for future technologies. Voice and data connections will be deployed per this policy statement,

but no fewer than 3 drops per room: two data and one voice. All drops shall be terminated as described by the 568A color code and should be indicated as such on drawings. Designer shall make final count based on Owner program and the Information Technology Division input.

12.6 Telecommunications Rooms and Spaces

12.6.1 Quantity and Location: Telecommunications rooms are spaces allocated for communication backbone and horizontal pathways and cables. Stack these rooms one above the other in multi-floor buildings and provide for Sufficient pathway between data rooms. Telecommunications room’s house voice and data electronics, uninterruptible power supplies (UPS), equipment racks, termination blocks, patch panels, fiber termination units (FTUs), grounding bars, and copper and fiber patch cords. A connection point for each wire in a horizontal cable run is terminated here. Provide for at least one telecommunications room per floor located such that all work areas present, planned and/or future will require data cable lengths not exceeding 90 meters (295’-3’’).

12.6.2 Size and Location: Pathways and spaces to include telecommunications room sizing shall comply with EIA/TIA-569-B (available on the web at www.globaltec.com/eia_569.htm). The size of the telecommunications room and the recommended count of equipment racks is determined by the size of the work area per the following schedule:

Work Area Size	Min. Room Size	Rack Count
10,000 square feet	10 X 11 feet	Three racks with 48 port panels with cable management
8,000 square feet	10 x 9 feet	Two racks with 48 port panels with cable management
5,000 square feet	10 x 7 feet	One rack with 48 port panels with cable management
*Additional rooms may be required to meet the needs of high density data use areas, such as computer labs. **If covered area exceeds 10,000 sq. ft. and/or if horizontal cabling distance between telecommunications room and workstation exceeds 90m (259’-3’’), then provide additional telecommunications room(s).		

Equipment racks should be floor mounted, 7 foot 45u in height.

12.6.3 Telecommunications room environmental, power, and related items: The following defines the common requirements for all spaces allocated for voice and data infrastructure and electronics (all MDFs and IDF’s).

12.6.3.1 Separate temperature and humidity controls 7 days a week 24 hours a day. The temperature shall range from 65 degrees to 75 degrees with 30% to 55%

relative humidity. Provide for one air change per hour minimum. Provide air filtration system to reduce air borne particulate.

- 12.6.3.2 Design spaces to be free of dust and other contaminates.
- 12.6.3.3 Design floors that can be kept clean (vinyl composition tile, sheet vinyl, or sealed concrete). No carpeting.
- 12.6.3.4 Provide for a code-approved fire extinguishing system that does not discharge water directly on electronic equipment.
- 12.6.3.5 Design spaces that are free of water and drain pipes to avoid condensation and dripping on voice and data electronics.
- 12.6.3.6 A minimum of four dedicated 120V AC, 20 amp duplex electrical outlets. Design electrical panels serving these rooms to be connected to the building's emergency power source. These outlets must be of type NEMA 5-20R. .
- 12.6.3.7 Proper grounding and bonding of voice and data cable, hardware, racks, raceway and equipment as specified by ANSI/TIA/EIA-607 standards for telecommunications rooms.
- 12.6.3.8 Specify that walls be covered with ¾ inch flame retardant treated plywood and painted with two coats of black fire retardant paint.
- 12.6.3.9 Locate spaces away from transformers, motors, power generators and radio transmitters.
- 12.6.3.10 Design lighting a minimum of 50 foot candles (illumination measured 3 feet above the finished floor) and not powered from the same electrical distribution panels as the voice and data equipment to prevent noise and hum.
- 12.6.3.11 A locking fire door 3'-0" x 6'-8" with no doorsill or center post. Provide exterior doors with hinges with non-rising pins.
- 12.6.3.12 Communication spaces shall not be shared with other utilities or services.
- 12.6.3.13 Spaces shall not have suspended or false ceilings. Design ceiling height to be 8'-6" minimum.
- 12.6.3.14 The floors shall have a load-carrying capacity of at least 100 lbs./sq. ft.
- 12.6.3.15 Terminal fields and frames shall have a minimum of three feet clear working space in front of wall-mounted equipment and front and rear of rack-mounted equipment.
- 12.6.3.16 Communication space shall not have windows.
- 12.6.3.17 Provide that all riser and horizontal sleeves and conduits are fire stopped and sealed following code requirements.

12.6.4 Where possible, indicate plant in existing accesses such as conduit systems, steam tunnels, and other existing building-to-building connections. All cabling placed in other MTSU-provided access shall comply with all MTSU specifications including, but not limited to, efficient use of existing space, physical protection, access, etc.

12.6.5 In cases where placement of conduit is difficult or construction is overly expensive, the Contractor shall so inform MTSU so as to provide MTSU with the option of placing additional conduits while the ground is open in order to avoid future costs.

12.6.6 Unless otherwise approved, design conduit formations in a duct bank as follows:

Ducts	Formation
four	2H x 2W
six	2H x 3W
nine	3H x 3W

twelve	3H x 4W
over twelve	Consult MTSU

- 12.7 There should be a handhold every 400 feet of conduit. No more than two 90's between pull points. Where 90 degree bends are required for inside or outside conduit should utilize a sweeping bend minimum 36 inch radius.
- 12.8 Indicate new manholes constructed at appropriate points as necessary to provide for splicing of outside cables installed in new and existing buried conduit. Determine the standard size of new manholes as a part of the project.
- 12.9 Ensure that modular office partition systems (Herman Miller, Steelcase, etc.) are connected to voice and data systems. Do not use voice and data systems that come with these (essentially) furniture systems. Ensure that data patch cables are 25'-0" long maximum and go from wall jacks to computers in office furniture systems. Do not place furniture in front of or such that it obstructs voice and data jacks.

13. POLICIES FOR MTSU USERS:

- 13.1 If the telecommunications infrastructure needs to be modified and/or installed to meet a department's communication requirements, the Information Technology Division will bill the department accordingly for the facilities installed.
- 13.2 Users shall report any unauthorized use of the Information Technology Division managed telecommunications infrastructure to the Information Technology Division management for appropriate action. The Information Technology Division will provide five days notice to the departments involved to correct the situation, unless effects to telecommunications services demand immediate removal. If the situation has not been resolved after 5 days, the Information Technology Division may disconnect such circuits or remove such cable. The Information Technology Division will take no responsibility for installations that have been performed without Information Technology Division approval and/or without adherence to the articles of this policy or Section 27100 – Cable Plant.
- 13.3 The telecommunications trunks and risers will be maintained and records updated by the Information Technology Division technicians.
 - 13.3.1 Riser: The main distribution cable segments that run between floors or sections of a building. Risers may be fiber and/or copper.
 - 13.3.2 Trunk: Trunks may be fiber and/or copper. 1) A single communications path between switching centers and/or individual distribution points. 2) A high-capacity connection between switches. From a customer perspective, trunk may refer to an external carrier line connected to customer premises equipment/private branch exchange (CPE/PBX), including local exchange lines, wide area telecommunications service (WATS) lines and dedicated private lines. Customer trunks may be outgoing only, incoming only, or two-

way. Trunks perform various control functions associated with call processing.

- 13.4 All move, add, or change work will be managed or performed by Information Technology Division technicians.
- 13.5 The telecommunications rooms will remain locked at all times and the Information Technology Division will be the only personnel authorized to have access, unless other equipment installed in the telecommunications room dictates otherwise. The Information Technology Division recognizes that in many locations throughout campus, because of space and budgetary constraints, the telecommunications rooms have to be shared with HVAC equipment, fire alarm systems, etc.
- 13.6 Other than code-mandated communications devices, any discretionary non-regulatory use of telecommunications cabling (e.g., video, security, fire alarm, etc.) will be at the sole discretion of the Information Technology Division and based on:
- the availability of cable (present and anticipated use)
 - alternatives available for the provision of such services
 - assurances that other such use will not interfere with the proper functioning of Information Technology Division voice and data services
- 13.6.1 All additions and/or modifications to telecommunications rooms, trunks, and/or risers, internal and/or external to the building necessary to provide for code-mandated communications requirements will be included in the scope of the project.
- 13.7 Users shall direct questions regarding installation or use of telecommunications equipment to contacts listed in Paragraph 1.6 of this Policy statement.
- 13.8 If the telecommunications cabling infrastructure is modified and/or installed to accommodate a project's need, the Information Technology Division will bill the project accordingly for the facilities installed. Where billing is involved, payees shall agree to the estimated costs furnished by the Information Technology Division in writing before acquisition of materials and construction.

END OF POLICY STATEMENT