

State of Michigan Technical Standard

1345.00.01 NETWORK AND TELECOMMUNICATIONS LOCAL AREA NETWORK (LAN) CABLING STANDARD

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Authoritative Policy: [1345 Information Technology Network & Infrastructure Policy](https://www.michigan.gov/documents/dmb/1345.00_282982_7.pdf)
(https://www.michigan.gov/documents/dmb/1345.00_282982_7.pdf)

Associated Procedures: n/a

Distribution: Statewide

PURPOSE

To establish a statewide standard for Local Area Network (LAN) cabling within state of Michigan (SOM) government agencies in a consistent manner as well as to comply with Public Act 431 of 1984, as amended.

CONTACT/OWNER

Department of Technology, Management and Budget (DTMB)
Infrastructure & Operations (I&O)
Network and Telecommunications Services Division (NTSD)

SCOPE

Applicable to all state of Michigan information technology systems that require DTMB NTSD Local Area Network (LAN) cabling.

STANDARD

DTMB NTSD or its appointed designee shall provide installation services to SOM Executive Branch Agencies for information transport cable within their areas. All such LAN cabling shall identify and define the following:

- A listing of the most common applicable Standards and Codes bodies.
- A partial listing of standards, codes and best practices for management of information transport systems (ITS) media relating to LAN cabling.

APPLICABLE CODES AND STANDARDS

A partial list of the most common applicable Codes and Standards bodies follows:

1. National Electrical Code (NEC)
2. National Fire Protection Association (NFPA)

3. Underwriters Laboratory (UL)
4. American National Standards Institute (ANSI)
5. Electronic Industries Alliance (EIA)
6. Telecommunication Industry Association (TIA)
7. Building Industry Consulting Services International (BICSI)

REQUIREMENTS

Information provided herein is a basic guide for the installation of LAN information transport system cable. This guide provides general information as to the type of cable and terminating hardware to be used in SOM buildings. It is the responsibility of DTMB NTSD or its assigned designee for installation services to apply for and obtain all applicable permits as well as meet or exceed all applicable standards and codes.

LAN ITS CABLE

1. The information transport system will adhere, but not be limited, to NEC, NFPA, ANSI/EIA/TIA and BICSI codes and standards.
2. Required permits will be on site as work commences.
3. The horizontal cabling system will adhere to, but not be limited to, the EIA/TIA 568 Standard and BICSI Standards. The data cable will be rated CAT 5e or above. New building construction data cable will be rated CAT 6 or above.
4. LAN cable in the main telephone room (MTR) or telephone room (TR) will be terminated on an RJ45 jack or patch panel. This jack or patch panel will be rated with a bandwidth at least the same or higher than the attached cable.
5. LAN cable will be terminated on an RJ45 jack at the distributed end (work area). This jack will be rated with a bandwidth at least the same or higher than the cable from the MTR/TR.
6. Patch panels will be wall or rack mounted.
7. Plenum cable will be installed in all plenum areas. Non-plenum areas do not require plenum cable.
8. Wall fields and equipment racks will contain cable management systems (CMS).
9. All LAN cable termination points will be properly labeled with unique drop numbers per floor, at both cable ends, in accordance with ANSI/TIA/EIA-606-B standard.

Note: Documentation of the ANSI/TIA/EIA, BICSI, NEC and NFPA standards referenced in this document can be purchased from the responsible organization:

- [BICSI](http://www.bicsi.org) (www.bicsi.org)
- [TIA](http://www.tiaonline.org) (www.tiaonline.org)

- [ANSI](http://webstore.ansi.org) (<http://webstore.ansi.org>).
- [EIA](https://ecia.memberclicks.net/eia-technical-standards) (<https://ecia.memberclicks.net/eia-technical-standards>) standards are now managed by the Electronic Components Industry Association.
- 'NEC' the National Electrical Code is a trademark of the [National Fire Protection Association](https://www.nfpa.org) (<https://www.nfpa.org>).

GLOSSARY

ANSI

American National Standards Institute – A private, nonprofit organization that functions as an administrator and coordinator of American voluntary standardization systems. Its membership includes private and public sector organizations.

BICSI

Building Industry Consulting Services International – Helps develop standards and guidelines for networking. Its certifications are de-facto standards for cable installers.

CAT 5e

Enhanced Category 5 – An unshielded twisted pair (UTP) cable that can support data speeds of 1000 Mbps, i.e., gigabit speed. Cables can reach a length of 100 meters.

CAT 6

Category 6 – A UTP cable that is backward compatible with CAT 5e has greater immunity from noise and crosstalk, and can handle data speeds of 10 Gigabits per second (Gbps, i.e. 10 GBase-T). It provides performance of up to 250 MHz.

CAT 6A

Category 6A, or Augmented Category 6. This has improved alien crosstalk characteristics, enabling 10 GBase-T to be run for a distance of 100 meters. It has doubled the bandwidth frequency from 250 MHz (CAT 6) to 500 MHz.

CBTC

Commercial Building Telecommunications Cabling – A subcommittee of the TIA (see below), tasked with revising the TIA's "Building Automation System Cabling Standard."

CMS

Cable Management System.

DMARC

Demarcation point – This is the physical point at which the public network of a telecommunications organization, such as a phone or cable company ends and the private network of the customer begins. This is usually where the cable physically enters a building.

ECIA

Electronic Components Industry Association (see EIA below).

EIA

Electronics Industries Alliance – This organization ceased operations in February 2011. It assigned the maintenance of existing interconnect, passive electro-mechanical (IP&E) standards to the ECA, (Electronic Components Association), which in turn has joined the ECIA (Electronic Components Industry Association). From the ECIA's website as of 5/31/2013, "the EIA standards brand will continue for IP&E standards within ECIA."

ITS

Information Transport Systems – Systems and infrastructure that move information within a commercial building. That information can be audio, video, voice, data, electronic safety and security, environmental, and building controls.

MTR

Main Telecommunication Room – The room, located in the center of a building, for the telephone (voice), data and video services (DMARC). The room may also serve as the Telecommunication Room (TR) of the floor on which it exists.

NEC

National Electrical Code – Set of standards for the safe installations of electrical wiring and equipment. It is not a legally binding regulation, but it is often used by states and municipalities. "NEC" and "National Electrical Code" are registered trademarks of the National Fire Protection Association (NFPA). The NEC has also been approved by ANSI as a national standard.

NFPA

National Fire Protection Association – The organization that sets standards for fire protection and safety, including: requirements for protecting Plenum spaces; standards for plastics used in the construction of Plenum cables.

Plenum Cable

The type of cable deployed in Plenum spaces. They are required by NFPA standards to be coated with fire-retardant cable so that in the event of a fire they do not release toxic gases.

Plenum Space

The space in a building used to circulate air for air-conditioning and heating. It is also commonly used to house the cables for the building's telephone and computer networks. The most common examples are the space between the structural ceiling and the suspended ceiling or the space under a raised floor.

TIA

Telecommunications Industry Association – Accredited by ANSI to develop standards for information and communication technologies.

TR

Telecommunications Room – The rooms stacked on each floor of a multi-floor building (except the MTR) to house information outlet terminations and cable terminations for the riser system.

UL

Underwriters Laboratories – This is a global independent safety science company offering expertise in certification, validation, testing, inspections, auditing, education and advisory services.

APPROVING AUTHORITY

Brom Stibitz, Director

Revised: 06/29/2021