



ANYTOWN
Central School District

Anytown Central School District
Division 27: Telecommunications Infrastructure
Technology Systems Design Standards

Issued April 24, 2018



Archi-Technology
Technology Consultants LLC

Connecting People, Technology & Buildings

D27 Telecommunications Infrastructure Design Guide

Introduction

Purpose

To ensure all the district's Telecommunications Infrastructure Systems are designed to same industry best practices, system technology, and manufacturer-specific standards.

Audiences

These Design Standards shall be used by the following involved parties in the design, procurement, or installation of Integrated Communications Systems and Infrastructure:

- Architectural/Engineering firms
- Design professionals
- System integrators/vendors
- Tradespeople

Sections and Subsections

Each section focusing on a technology infrastructure system includes the following subsections:

- **Overview** describing the major functional requirements of the system.
- **Product Standards** to use when purchasing products from vendors.
- **Implementation Standards** to use when designing, installing and deploying these systems.
- **Documentation Standards** to use for Design and As-Built documentation for these subsystems.

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Telecommunications Infrastructure Overview

Systems

Telecommunications Infrastructure includes:

- Telecommunications Rooms (TRs) and Spaces
- Pathways
- Cabling
- Communications Outlet types and configurations
- Systems and Equipment

Applicable Industry Standards

- Americans with Disabilities Act
- ANSI/BICSI 005-2103 Electronic Safety and Security (ESS) System Design and Implementation Best Practices
- ANSI/TIA-568-C
- ANSI/TIA-569-C
- ANSI/TIA-606-B
- ANSI/TIA-758-B
- ANSI/NECA/BICSI 568
- ANSI/TIA-862-B Building Automations Systems
- ANSI/
● Building Code of New York State
- BICSI Telecommunications Distribution Methods Manual
- BICSI Customer-Owned Outside Plant Design Manual
- Federal Communications Commission
- Federal Occupational Safety and Health Administration
- Institute of Electrical and Electronics Engineers, Inc. (IEEE)
- Insulated Cable Engineers Association
- ISO/IEC 11801-International Organization for Standardization
- National Life Safety Code, NFPA 101
- National Electrical Code, NFPA 70 (NEC)
- NYS State Education Department (NYSED), Office of Facilities Planning - Manual of Planning Standards for school buildings
- New York State Department of Labor Rules and Regulations
- New York State Department of Health
- National Electrical Safety Code (NESC)
- National Fire Protection Association (NFPA)
- OSHA (Standards-29 CRF) Telecommunications –1910.268
- TIA/EIA-J-STD-037
- Underwriters Laboratory

Telecommunications Rooms (TRs) and Spaces

Overview

Telecommunications Rooms (TRs) contain Network, Voice, Access Control, Intrusion Detection, Video Surveillance and Public Address (PA) equipment and cabling. There are several types of these rooms which are described below along with their functions and requirements. The terms and definitions are specific to the TCSD IT Department.

Telecommunications Room (TR)

These are rooms that contain equipment and cabling for systems such as Network, Voice, Public Address (PA), Access Control, Intrusion Detection, Video Surveillance, and CATV cabling and equipment. Each TR provides connection point between the work area outlets and edge devices of each system and the network in a predetermined serving zone. Each building must have at least one TR but most buildings have several. The number of TRs a building has depends on the several factors such as:

- Distance limitations of the Horizontal cabling
- Connected Device counts
- Building Construction

Because of their function TRs are specialized rooms that have unique requirements that need to be considered during the Design such as;

- Security
- Environmental control
- Power/ Emergency Power
- Telecommunications Grounding Backbone

TRs are grouped into two categories:

- Main Telecommunications Rooms (MTR) and;
- Intermediate Telecommunications Rooms (ITRs).

An MTR connects all ITRs via Intra-building backbone cabling and pathways. The MTR is also the location where the building Network equipment connects to the Inter-building Outside Plant Cabling (OSP) cabling of the District's CORE Networks.

Entrance Facilities (EF)

Entrance Facilities (EF) are communications spaces that provide a Transition Point between the Outside Plant cabling and the Service Provider cabling. EFs can be located within a TR but, due to code considerations with respect to OSP cabling, these are often separate spaces near the point where the OSP cabling enters the building. Entrance Facilities also provide a Demarc location between Outside Service Providers where the district can connect to the Services.

Server Rooms (SR)

Server Rooms (SR) are climate controlled spaces dedicated to the continuous operation of computer servers. These spaces shall have min 36" doors to allow for the installation and removal of large equipment.

Location: Shall not be located on top floor or in basements. Avoid exterior walls with windows to maximize security. Ideally the room should be located in a centralized location within the building. The Server Room shall be accessible without having to use stairs of any type. Generally first levels are preferred locations.

Product Standards for TR and Spaces

Racks

- **Size:** 19"w x 84"h
- **Type:** 4 post
- **Fittings**
 - Provide communications racks within each TR.
 - Racks must accommodate at least 33% growth after original design.
- **Preferred vendor:** See *Appendix A* for more information.

Cabinets

- **Size:** 19"w x 7'h x 28"d
- **Preferred vendor:** See *Appendix A* for more information.

Important Note: Cabinets are only to be used upon approval of the IT department.

Cable Management

- **Size:** 16"w x 7"h
- **Vertical Cable Management Fittings:** Provide a minimum of (2) vertical Front/Rear cable management to each rack.
- **Preferred vendor:** See *Appendix A* for more information.

Cable Runway

- **Size:** 12" – 18"w
- **Type:** Hollow bar, Telco-style construction with 9" spacing between rungs and black powder coated.
- **Fittings:** Hollow-bar, metal cable runway shall be provided around the room and over the communication racks. (Wire basket tray or any other cable tray is not permitted. See details for typical room configuration).
 - The cable runway shall be mounted 7'6" above the Communications Racks.
 - Provide a rack mount kit that connects to the cable runway to the Communications Racks.
 - Provide radius drop out kits where cables will drop into vertical management of the Communications Racks.
 - Runway must accommodate at least 33% growth after original design.
 - Runway must be supported by wall brackets, trapeze hangers and $\frac{3}{8}$ " threaded rod and rack connection kits (provide threaded rod covers as required).
- **Preferred vendor:** See *Appendix A* for more information.

Power Strips

- **Type:** 8-outlet, 20 Amp
- **Fittings:** Provide (2) power strips for each rack.
- **Preferred vendor:** See *Appendix A*