

COMMUNICATION SYSTEMS

General: Each new building or addition to an existing building shall include spaces designated for the location of communications equipment. These spaces will be called • Wireless network systems

- Closed circuit television (CCTV) systems
- Fire alarm panels
- Card access panels
- Cable television (CATV) systems
- Un-Interruptible Power Supplies (UPS) for these systems
- Telephone company demarcation points
- Wireless network system
- Wireless access points
- Life Safety Radio System

Use Restriction: TRs shall not be used as passageways to other equipment rooms, power transformers, custodial equipment, or any other function that would require access for reasons

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Telecommunication Room Sizing Matrix			
TR Service Area Square Feet	CL Quantity	TR Cabling Racks Needed (Based on 1 Rack per 240 CLs)	TR Size Needed
0 - 21,600	0 - 240	1	10 ft x 12 ft.
21,601 - 43,200	241 - 480	2	10 ft. x 15 ft.
43,201 - 64,800	481 - 720	3	10 ft. x 18 ft.

Structured Cabling System: A certified Structured Cabling System with a 25-year CAT6 link performance compliance warranty is required.

TR Room Construction Requirements: See "*Equipment Rooms, Communications*" within these design guidelines for TR room construction requirements.

Outside Pathway Requirements:

- A minimum of two 4" entrance conduits will be installed into any building.
- Outside plant copper, fiber, and coaxial cable shall be installed together in one of the conduits while the other conduit is for future services and disaster mitigation.
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- Dual entrances are very desirable where possible, especially for buildings that house emergency services, data core systems, disaster recovery systems, or designated as an essential services building on campus.

Riser Pathways (from one TR to another): When more than one TR will be needed in a building, two 4" conduits will be installed from the main TR to the other TRs in the building. These conduits will be used to connect all communication services between the TRs.

Primary horizontal pathways for each floor (conduits and cable tray):

- Primary pathways are major pathways for cable routed floor-to-floor, through corridors, and

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Wireless Network System:

- Include a Predictive Site Analysis (PSA) to guide the design of the wireless network inside the building. The wireless network shall provide reliable connectivity for staff, faculty, students, and visitors throughout the building.
- The wireless design shall provide a network that supports a mixture of end user devices that are typical of a campus environment. The network shall provide sufficient throughput to all users connected.
- The Predictive Site Analysis shall include the following tasks (minimum):
 - Wireless design throughout designated spaces via software utilizing project drawings (CAD files) and data to build software models. Wireless design within the spaces shall be tailored to the various types of spaces within the building (i.e. offices vs. classrooms vs. hallways vs. lounges, etc.)
 - The PSA to incorporate building characteristics including all applicable wall, floor, ceiling construction types, complete space geometries, as well as expected occupant loads. Information needed for this effort will be provided by design team. Design shall be mindful of maintenance, security, and vandalism concerns in locating wireless network components within public spaces.
 - Design shall include complete wireless coverage at and within all building entrance spaces including vestibules, covered walkways, etc.
 - The design shall provide spare capacity for added network loads in the future.
 - Findings of the PSA shall be delivered in a report format with drawings depicting physical component installation locations, cable routing paths, power requirements for components, interconnections needed with ITS infrastructure, floor-by-floor heat maps of RF coverage, and a complete bill of material that was used in developing the PSA documents.
 - Design included in the PSA shall be based on the following access point (AP) devices or approved equal. Ensure design incorporates Aps with performance characteristics matching the following or better:
 - Interior APs: Cisco AIR-AP2802I-X-K9
 - Interior APs: Cisco AIR-AP1810W-X-K9
 - Exterior APs: Cisco AIR-AP1562D-X-K9 (directional)
 - Exterior APs: Cisco AIR-AP1562I-X-K9 (omni-directional pole mount)
 - Design shall include labels for all APs matching NU requirements. Naming convention as follows: 'AP MODEL NO'-'4 DIGIT BUILDING NO'-'ROOM NO'.
 - Verify label scheme with NU-Wireless and include labels on design plan sheets.
 - Include with PSA an excel file with AP designations for review and editing by NU-Wireless.
- Unless otherwise instructed by NU, a PSA shall be provided for all projects, including all renovations, additions, and new building construction projects.
- The wireless configuration shall be approved by NU-Wireless prior to design completion.

Wireless Access Points:

- Provide dedicated communication cables and all required rough-in work for wireless access points (WAPs). WAPs provided by NU. See Specification Section 271500 for full installation requirements for WAPs, including spacing criteria.
- Each WAP location with have one (1) EQUIPMENT OUTLET (EO) with two (2) dedicated CAT 6 cables.
- Project shall test all WAP cable installations and certify all cables for proper performance. Share all testing results with NU Wireless ITS staff.
- Provide data cable labels, at both ends of cable, per NU Wireless ITS requirements.
- In all cases cables shall not be painted.

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Life Safety Radio System

NU Police will test the operability of life safety radio systems within structures and provide project managers with specifications for any enhancements necessary to ensure full functionality of such systems.