

Contents

1. Telecom Manholes.....	1
2. Service Entrance Construction.....	2
3. Service Entrance Cabling.....	4
4. Telecommunications Rooms.....	4
5. Building Wiring System Design.....	7
6. Horizontal Pathways and Spaces.....	8
7. Backbone Cable Design.....	10
8. Work Areas.....	10
9. Cable Installation and Distribution.....	11
10. Special Consideration of Patient Care Facilities.....	12

1. Telecom Manholes

1.1. Manholes

1.1.1. Manholes will be placed to connect conduit runs together and/or to provide a cable pulling and splicing location as necessary. In addition, conduit runs shall not extend beyond 500 feet without installation of a manhole.

1.1.2. Manholes shall be installed in accordance with the applicable code requirements.

1.1.3. Manhole(s) will use a minimum concrete strength of 3,500 psi.

1.1.4. The interior of each manhole shall have galvanized steel pulling eyes located opposite of each entering conduit or duct bank.

1.1.5. Nylon wall racks manufactured by Underground Devices Incorporated or a compatible product anchored with stainless hardware. Stanchions will extend 18 inches above the floor. Stanchions shall be installed in accordance with the applicable code requirements.

1.1.6. Each manhole shall have a sump pit of at least 18 inches in diameter and 18 inches deep in the floor.

2. Service Entrance Construction

2.1. General Information

2.1.1. Division of IT will work with Project Management and/or their assigned engineering firm to design service entrances in accordance with the design of the cabling to be installed.

2.2. Conduit Quantity, Type, and Size

2.2.1. All buried conduit shall be PVC, schedule 40 concrete encased and rebar reinforced.

2.2.2. Concrete shall be undyed.

2.2.3. All conduit exposed to sunlight shall be UV rated.

2.2.4. Conduit shall be installed from to a building as a minimum. Specific conduit quantities shall be determined on a building-by-building basis. Items for consideration are: type and use of building, growth, difficulty of adding pathways in the future, alternate entrances, and type and size of cables likely to be installed.

2.2.5. All conduits and inner ducts shall be equipped with a minimum 1,500 lb. Strength mule-tape pull line with sequential numbering.

2.2.6. All new conduits will be tested with a mandrill one trade size smaller than the conduit.

2.2.7. A diverse building entrance will be established if possible and desired for redundancy.

2.3. Conduit Installation Methods

2.3.1. Galvanized metal conduit shall be installed through the building penetration, outside of the building, to be connected to PVC conduit for the rest of the run. Metal conduit shall be extended 5 feet away from the building foundation.

2.3.2. Metal conduits entering the building through the floor slab shall be extended a minimum of 4 inches above the finished floor. Conduits entering the building through a sidewall shall be extended a minimum of 3 inches beyond the inside wall.

2.3.3. The ends of metallic conduit shall be reamed, bushed, and grounded according to the NEC and NESC.

2.3.4. Top of conduit must be buried at least 36 inches below the ground surface.

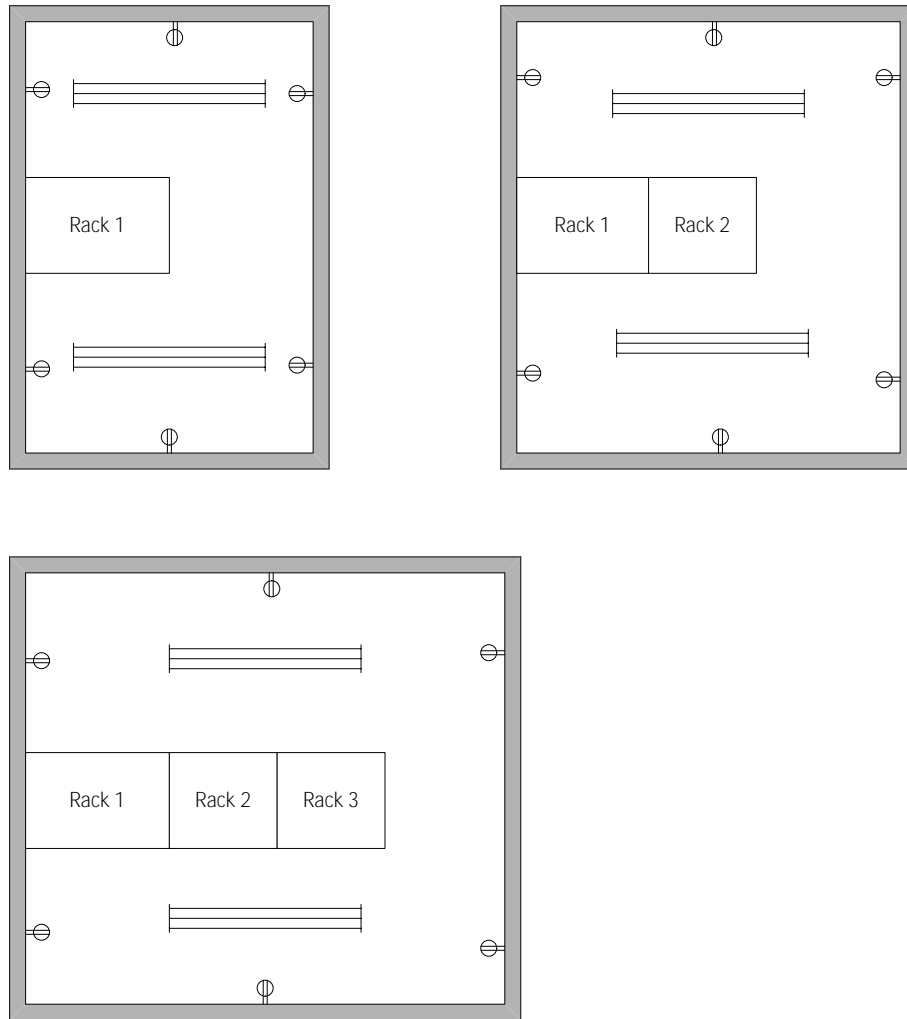
2.3.5. The conduit shall slope down and away from the building to accommodate drainage.

2.3.6. After installation of cables, Division of IT or its authorized vendor shall be responsible for sealing all conduits. All conduits shall be plugged to restrict infiltration of gas, water, and vermin.

*Division of IT Telecommunications Construction Standards
and Specifications
revised 9/27/20*

2.3.7. When joint-trenches are used to install other utilities along with telecommunications facilities, the following separation distances should be used:

Adjacent Structure...	Minimum Separation...
Power or other foreign	



4.3. Telecom Room Environment

4.3.1. Note #1 shows the location of a dedicated L5-30 circuit per rack. A L5-30 using emergency power is also required if available per rack. All outlets near

4.3.2. HVAC needs to be conditioned to the same standards and the occupied areas in the building. This temperature and humidity need to be maintained 24/7/365.

Environmental Factor ...	Requirement...
Temperature Range	18 C to 24 C 68 F to 75 F
Humidity Range	30 percent to 70 percent relative
Air Quality	Filtration systems may be

*Division of IT Telecommunications Construction Standards
and Specifications*

*Division of IT Telecommunications Construction Standards
and Specifications
revised 9/27/20*

- 5.1.5. Project design shall call for adequate backbone conduits between telecommunications rooms. Conduit size and quantity shall be dictated by the size, type and quantities of the cables to be installed but preferred not to be less than four (4) inches in diameter.
- 5.1.6. Cables do not need to be labeled by the contractor.
- 5.1.7. Division of IT will terminate, label and test all cabling and install all electronic equipment.
- 5.1.8. Cat6A shall be installed directionally from the telecom room outward.

6.

*Division of IT Telecommunications Construction Standards
and Specifications
revised 9/27/20*

6.1.2.8. Bundles of cables supported by typical J-hooks should not be larger than 50 cables, unless additional support is provided.

6.1.2.9. Horizontal pathway design should take into consideration the

- 8.7.1.7. With one data cable.
- 8.7.1.8. Not required in secure facilities.
- 8.7.1.9. Installed by DoIT.

8.8. Security Cameras

8.8.1. Shall be installed:

- 8.8.1.1. In areas to capture the front view of people entering and exiting a building.
- 8.8.1.2. In areas leading to connected buildings capturing the front view of people entering and exiting.
- 8.8.1.3. Exterior cameras will cover student gathering areas.
- 8.8.1.4. Exterior cameras will be installed in a flush 2x4 electrical box.
- 8.8.1.5. Interior cameras will be terminated on a jack above the ceiling or in a flush 2x4 box depending on the ceiling type.
- 8.8.1.6. Network based by DoIT for Campus and Hospital Security for the Hospitals and Clinics.
- 8.8.1.7. With one data cable to the local telecom room.
- 8.8.1.8. In all E&G buildings.

8.8.2. More camera and expense.

9. Cabling Installation and Distribution

9.1. Cable Type, Source of Materials, and Assignment of Tasks.

- 9.1.1. All vertical and horizontal in-building cable shall be plenum rated.
- 9.1.2. All cable will terminate in a telecom room on the same floor as the outlet.
- 9.1.3. Division of IT will install all backbone cable and perform terminating and testing of such facilities.
- 9.1.4. The contractor shall install owner provided cabling as specified for the project. The Division of IT will terminate and test all contractor installed cabling. Division of IT will provide all materials including cable, connecting hardware, terminals, equipment racks, etc.
- 9.1.5. The contractor/installer shall consider the following critical installation practices when installing telecommunications cabling.
 - 9.1.5.1. Physical separation from all sources of EMI is critical. Sources of EMI include but are not limited to: motors, transformers, copiers, construction equipment, and branch circuit power cables. Cabling that leaves physical pathways and extends into office areas must not lay on fluorescent lighting.

- 9.1.5.2. Conduit or other raceway pulling tensions should be minimized using suitable equipment and practices.
- 9.1.5.3. Cables must not lie on or be suspended from suspended ceiling support wires or frames.
- 9.1.5.4. Eliminate cable stress caused by tension in suspended cable runs. Cables must exhibit some sag in hanging between supports. Hanging supports, such as J-hooks, must be within 5 feet of each other.
- 9.1.5.5. Cables bundles should not be larger than 50 cables and shall not be tightly cinched together. Tie wraps must be hand tightened without tools. Cables must never be twisted.
- 9.1.5.6. Installations of CAT6A cable should have bend radii less than six (6) times the cable diameter. For fiber optic cable, the minimum recommended bend radius is ten (10) times the cable diameter, twenty (20) times the cable diameter if loaded.
- 9.1.5.7. Cables shall not be spliced under any circumstances. Damaged or broken cables must be completely replaced or decommissioned with a label attached at both ends.
- 9.1.5.8. Conduits should not be daisy chained together.
- 9.1.5.9. Provide adequate slack at both ends to accommodate terminations:

Location...	Slack length...
Outlet	12 inches
Telecom Room	10 feet past termination point

10. Special Considerations for Patient Care Facilities

- 10.1. Patient care facilities require a higher standard of network service and reliability than other areas. The following is a guide to achieve this level.
- 10.2. Spacing of the wireless access points should be based on a 25 foot grid for patient care facilities or high capacity areas.
- 10.3. Proximity sensors and door signs require three (3) data outlets terminated above each door in the facility six (6) inches above the ceiling tile in a standard flush wall box.
- 10.4. Electronic card swipe access is required for telecom room security.