

Appendix D - COMMUNICATION ROOM STANDARDS

Arlington County Government  
Communications Room Standards

Reference standard excerpt from Arlington County Government Department of Technology Services Network Infrastructure Standards (6/19/2015), pages 2-7.

**Arlington County Communications Room Standards**

**1. Location**

- a. Room must be located within 295 cable feet of the most-distant communication outlets.
- b. One room per floor up to 20,000 sq. ft. floor. For large floors an effort should be made to divide the floor into sections no larger than 7,000 sq. ft. (following the building layout and/or using ordinals). The cable plant can still utilize a single communications room, but should use separate patch panels for each section.
- c. Room needs to be accessible from a hallway or exterior access
- d. Meets power and environmental requirements
- e. Sprinkler system is dry inside the room
- f. Final approval is required from DTS Network Services
- g. Dedicated to network services and not used for any other functions or purpose.

**2. Size**

- a. Minimum closet size is 10'x10' with an 8' ceiling, minimum closet size is determined using the following table:

Number Active Data Drops Served	Minimum Closet Size
<48	10' x 10'
48 to 144	10' x 12'
>144	10' x 16'

**3. Doors**

- a. Entrance doors must open out
- b. Doors are a minimum of 3'6" wide and 7' tall.
- c. Secured by Control Systems (DTS issued card access)

**4. Walls\Floor\Ceiling**

- a. Slab to slab required
- b. To keep dust and static electricity to a minimum in the communications rooms, use floor finishes of asphalt tile, static free linoleum tile, and concrete with cement sealers or paints. ABSOLUTELY NO CARPETING.
- c. No windows desired
- d. All wall and ceiling surfaces should be light in color.
- e. Plywood boards (4'x8'x3/4" fire retardant) mounted on wall behind equipment rack(s) capable of supporting 50 lbs. per linear foot of wall space. 16 sq. ft. at a minimum (4'x4') with 4'x8' preferred. Plywood painted to match the room. UL fire-rating symbol/stamp should be left exposed on each sheet of plywood.

**5. Electrical Power\Grounding (These are general requirements; more specific details may be provided for special projects)**

- a. Buildings should have a generator and centralized UPS that provides backup power to each communication room. Each communication room should be served with both utility power and UPS/generator power based on the following table.

Utility Power Per Communications Room				
Number Of Active Data Drops	Number of NEMA 5-20 Outlet	Number of NEMA 6-20 Outlets	Additional Power Requirements	
<96	4			
96 – 240	4	3	Hardwire Terminal Block 3W + G (L-L-N-G) <sup>1</sup>	
Generator/UPS Power Per Communications Room				
Number Of Active Data Drops	Number of NEMA 5-20 Outlet	Number of NEMA 6-20 Outlets	Additional Power Requirements	Minimum Available Watts Available per
<96	4			4,000
96 – 240	4	3		12,000

1. Not required if providing centralized UPS/Generator power.

- b. All circuits shall be installed on the top of the equipment rack and have a prominent, permanent, machine-made label indicating the electrical panel number, breaker number, and room number of the breaker panel that feeds the circuit.
- c. Outlets connected to the generator should be identified Orange in color
- d. All vertical and horizontal racking must include a bonded ground.

**6. Lighting**

- a. Must ensure a minimum of 50 foot candles, measured 3’ above the finished floor.
- b. A wall switch to turn room lighting on and off should be located immediately inside the door.
- c. Due to the interference it generates, fluorescent lighting should be avoided at all cost.

**7. Environmental Control**

- a. HVAC shall be included in the design of the closet to maintain a temperature between 72 - 85 degrees Fahrenheit. The exact BTU’s will be provided at time of bid.
- b. HVAC (24 hours per day and 365 days per year) must run separately from the building system at all times.
- c. A positive pressure shall be maintained with a minimum of one air change per hour, or as required by applicable code. When installation of active devices (heat producing equipment) is known to be required, a sufficient number of air changes shall be provided to dissipate the heat produced.
- d. HVAC units should not be installed above any computer equipment rack and a be minimum of 6 inches from the edge of a computer equipment rack
- e. No water or steam pipes should run through or above the room with the exception of a sprinkler system (if required by local fire codes).
- f. Relative humidity will be maintained between 30% and 50%. Failure to adhere to these specifications could produce serious corrosion of the copper wires used in UTP and STP.
- g. HVAC shall be provided according to the following table unless more specific information is provided:

Number of Racks	BTU/Hr (max)	BTU/Hr (de-rated)	Tons of HVAC (max rounded down)
1	6,500	4,875	½ ton
2	13,000	9,750	1 ton
3	19,500	14,625	1 ½ ton

\* These figures are derived as follows: (1) Each rack has two power strips. (2) Each power strip is a separate 20A circuit. (3) Each circuit is de-rated at the breaker to 16A. (4) 16A X 120VAC = 1,920 watts per rack. (5) 1,920 watts X 3.4 = 6,528 BTU/Hr per rack. (6) 1 ton = 12,000 BTU/Hr.

**8. Building Penetration\Riser Conduits\Pathways**

- a. Main Telco Closet\Demarc
  - i. Closest to the street access point, whether underground or above ground.
  - ii. Maintains power and temperature parameters as stated above.
  - iii. Separate key access with easy access from outside of building.
  - iv. At least four 4" conduits from street access to interior demarc closet.
- b. Riser & Extension
  - i. Minimum 2- 4" Conduits required for vertical risers between floors.
  - ii. Satellite communication closets should be stacked in multi-floor buildings allowing vertical 4" conduits to be connected between floors.
  - iii. A 1" metallic conduit will run to each closet and provide a grounding wire.
- c. Wall Penetration
  - i. Conduits and/or sleeves shall protrude into the closets at least 1" further than the wall surface (but not more than 3").
  - ii. All penetrations shall be filled with appropriate fire blocking material to ensure compliance with fire codes.
- d. Pathways
  - i. Conduit and/or cable tray penetrations into closets shall be as close to the entrance door as is practical.
  - ii. Horizontal and Vertical conduit penetrations shall feed follow the specifications outlined in Attachment A.
  - iii. All conduits and cable trays shall be free of burrs and sharp edges. Conduits shall be fitted with smooth bushings.

**9. Room Security\ Building Access**

- a. Communication closet doors shall be secured using a card reader system standardized and controlled by DTS (Accutech-using a HID MicroProx Tag)
- b. Access to buildings that contain one or more communication closets must include security access for 24x7 accesses for DTS personnel.
- c. Access to buildings, including layout, instructions and security POC information will be stored in the key box in the DTS NOC.

**10. Cable Standards**

- a. Copper
  - i. Jacks and Face plates
    - RJ 45 jacks will be used for data. Data jacks will be yellow.
    - Face plates will be white and capable of four terminations.

- Labeling for face plates and patch panels will be machine generated and match floor plans.
- ii. Station Cable
  - Only Category 6E yellow cable will be used for data drops.
  - Only Category 6E purple cable will be used for wireless access point drops.
- iii. Riser Cable
  - One Category 3, 25-pair riser shall be installed between the MDF and each satellite IDF and terminated on an RJ45, Cat5e 110 patch panel.
- iv. Certification
  - All cable drops will be certified and results will be documented as part of acceptance process.
- v. Warranty
  - Cable and workmanship will be guaranteed for a period of one year.
- vi. Standards
  - TIA standards, practices and procedures will be adhered to at all times.
- b. Fiber (between buildings)
  - i. Single mode fiber (ISO OS1) shall be installed between buildings.
  - ii. The single mode fiber will be terminated in the buildings data center or the building's main IT closet.
  - iii. Fiber terminations shall be SC/APC connectors.
  - iv. Fiber Optic Patch Panels (FOPP) will be mounted in specified 19" communication rack or on the wall (ply wood) of main IT closets.
  - v. FOPP shall be labeled to specify location of other end of fiber.
  - vi. Spare fiber cabling shall be coiled high on the wall.
  - vii. Fiber cabling shall meet standard outdoor cabling requirements.
  - viii. See "Technical Specification for the Installation of Fiber Cabling" for specific fiber cabling installation and termination practices and material.
- c. Fiber (within building)
  - i. Multimode fiber (ISO OM3) shall be installed with a building.
  - ii. The multimode fiber will typically be installed from the main IT communication closet to the intermediate IT communication closets.
  - iii. Fiber terminations shall be SC connectors.
  - iv. Fiber Optic Patch Panels (FOPP) shall be mounted toward the top of specified 19" communication rack.
  - v. FOPP shall be labeled to specify location of other end of fiber.
  - vi. Fiber cabling shall meet standard indoor cabling requirements.
  - vii. See "Technical Specification for the Installation of Fiber Cabling" for specific fiber cabling installation and termination practices and material.
- d. Labeling
  - i. All cables, fiber centers, 66 blocks, and equipment must be labeled with machine made, permanent labels according to current labeling standards.

#### 11. Equipment Racks

- a. At a minimum one standard 19" open equipment rack shall be installed per IT communication closet.

- b. Large communication closets (supporting >48 active network drops) will require a second equipment rack. The two equipment racks shall be placed next to each other (side-by-side).
- c. The minimum distance between front of rack and wall shall be 4'.
- d. The minimum distance between back of rack and wall shall be 4'.
- e. The minimum distance between the side of one rack and wall shall be 4'.
- f. Vertical cable management shall be installed on each side of the equipment racks, including down the middle of two equipment racks sitting side-by-side.
- g. Horizontal cable management should be installed above and below each 24-port patch panel.
- h. Ladder rack shall be installed between equipment rack and wall. At a minimum from the conduit egress to the top of the rack
- i. Equipment rack must be secured at the top with a ladder or other device
- j. Equipment racks shall be bolted to the floor.
- k. Equipment racks shall be grounded.
- e. Acceptance of closet & Installation of Network Equipment
  - a. DTS requires 30 days prior to customer going live to burn in equipment
  - b. Substantial completion is not sufficient unless everything above is completed