

BUILDING
COMMUNICATION
ROOM
SPECIFICATIONS

NAS Patuxent River

Revision 7

BUILDING COMMUNICATION ROOM SPECIFICATIONS

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1. Overview

This document provides the recommended **minimum** specifications for building communications Entrance Facilities (EF), Communication Intermediate Distribution rooms (IDF) and communications closets. This document will refer to the combined rooms as the building Entrance Facility. The building communication Entrance Facility (EF) is a designated location within a building where the network cables (cables from outside the building) will terminate and network equipment will be installed to interface with the building premise communication systems (cables and equipment from inside the building). The network cables and equipment will provide video, data, DDC, physical security, Public Address systems, and voice communications within the base/campus. The Entrance Facility (EF) can be co-located with the building distribution room (IDF) if applicable and within ANSI/EIA/TIA design standards, to reduce facilities construction costs, backbone connection cost, and required building space. The size of the room will be determined for each of the buildings based on the communications required for that building; however, no EF or combined EF/IDF, shall be smaller than 200 sq. ft. unless otherwise approved by the government. At a **minimum**, for facilities supporting 12 or less persons, the EF may be located in an walk-in closet (must be 4.5 feet by 4.5 feet) or a shallow closet (must be 2 feet deep by 8.5 feet wide) per government approval.

2. Communication Room Specifications

The following specific requirements shall be adhered to when constructing any communication rooms or closet. All work performed shall be in accordance with all applicable ANSI/EIA/TIA stds, BICSI criteria, building codes and base standards. In the case of a conflict with any code or standards, the project construction officer shall be contacted to correct the discrepancy. All new communication design requirements will be accomplished by a registered RCDD on staff by the design group.

2.1 General

- 2.1.1 Communication rooms shall house only equipment directly related to the communications system and its environmental support systems. If the total electrical requirements of the environmental support equipment are over 100 kVA the equipment shall be located outside the room.
- 2.1.2 The equipment room shall be designed to meet the FIPS 175 or latest revisions, vibration specifications listed below.

Vibration Design Limits	
Frequency (Hz)	Vibration Amplitude
5 - 22	0.01 inches double amplitude displacement
22 - 500	0.25 g peak acceleration
500 - 22	0.25 g peak acceleration
22 - 5	inches double amplitude displacement

- 2.1.3 The communication room shall be protected from contaminants and pollutants that could affect the operation and material integrity of the installed equipment. When contaminants are present in concentrations greater than those indicated in the table below, vapor barriers, positive room pressure, or absolute filters shall be provided.

Typical Contamination Limits	
Contaminant	Concentration
Chlorine	0.01 ppm
Hydrogen Sulfide	0.05 ppm
Nitrogen Oxides	0.1 ppm
Sulfur Dioxide	0.3 ppm
Dust	100 ug/cu.m/24 h
Hydrocarbons	4 ug/cu.m/24 h

- 2.1.4 Photocopying equipment must be located at a distance greater than 10 feet from the equipment room.
- 2.1.5 Communication rooms shall not be located below water level unless approved by the government, and preventive measures against water infiltration are employed. The room shall be free of water or drain pipes not directly required to support the equipment in the room. A floor drain shall be provided in the room if a risk of water ingress exists.
- 2.1.6 Communication rooms shall be located away from sources of electromagnetic interference at a distance that will reduce the interference to 3.0 V/m throughout the frequency spectrum. Special attention shall be given to electrical power supply transformers, motors and generators, x-ray equipment, radio or radar transmitters, and induction sealing devices.
- 2.1.7 The entrance facility shall be centrally located as near as possible to the center of the building or core areas with exterior access whenever possible. In larger structures where more than one communication room is required per standards, entrance off a corridor pathway is acceptable. In multi floor facilities each floor shall have a communication room. Communication rooms shall be vertically stacked per standards to minimize backbone cabling runs unless otherwise approved by the government.

2.2 Demolition for Communication Rooms

- 2.2.1 Existing construction shall be removed and/or relocated as required. Any damage done to adjacent areas shall be repaired. Prior to any work being accomplished to an existing communication room contractor shall coordinate with government.

2.3 Walls

- 2.3.1 Walls shall be extended from the roof or floor deck above to the concrete floor and shall provide 1-hour fire separation walls composed of one layer of 5/8" fire code gypsum board (drywall) on both sides of 3-5/8" metal studs on 16" centers (OC). New walls shall be painted with one coat of primer and two coats of finish paint to match the existing building standards or with satin eggshell white latex paint. Existing walls shall be repaired and painted as outlined above. Finishes shall be light in color to enhance room lighting.
- 2.3.2 **All** walls of the communication room/closet shall have interior grade, good on one side, *fire-rated* 3/4" plywood. The plywood shall be vertically mounted, with the bottom 4 inches above finished floor (AFF). **Do not paint plywood; fire rating stamps on plywood shall be visible within Comm. Room.**

2.4 Floors

- 2.4.1 Flooring material having antistatic properties shall be selected.
- 2.4.2 Floors finishes shall be 12"x12"x1/8" *anti-static* vinyl tiles or approved equal, on floors and 4" high vinyl base on all walls. Tile and floor base molding shall match the existing building standards.

2.5 Ceiling

- 2.5.1 The ceiling of the communication room at a **minimum** must be 9 feet in height from the finished floor. A minimum clear height in the room shall be 8 feet without obstructions. All obstacles in the communications room area shall be re-routed to provide for a clear ceiling. False or suspended ceilings are **not** required or desired. If a suspended ceiling is present, at a minimum, shall be 24 inches above any cable tray or equipment rack/cabinets.

2.6 Doors

- 2.6.1 Doors shall be 3' x 7' x 1-3/4" hollow-metal 'B' labeled type. New doors shall match building finish, color, and style.
- 2.6.2 If existing doors meet the above specifications, they shall be patched, repaired, and painted as required. If the existing doors do not meet the above specifications, they shall be replaced with new doors as specified.
- 2.6.3 The entrance door shall have an "Authorized Personnel Only" sign.

- 2.6.4 Door hardware shall include but not be limited to knobs and hinges and shall match the existing building standards. Keyed locks shall be provided on the entrance door. The lock shall be keyed to the base master system, and four spare keys for all locks shall be provided to the government.
- 2.6.5 All communication room entrance doors shall have an electronic card reader tied to the building security system for access.

2.7 Fire Protection, Safety and Security

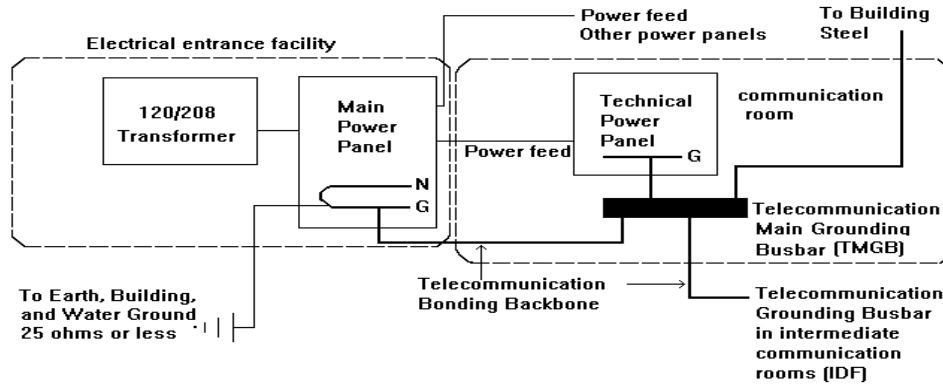
- 2.7.1 The communication room shall include fire protection and security systems that meet all applicable base standards. If a sprinkler system is required by codes or base standards, or if a sprinkler system exists, the system shall be a preaction-type system. If a preaction system is not possible and a wet pipe sprinkler system must be used or exists, the heads should be replaced with high-temperature, 212-degree heads if possible.
- 2.7.2 A wall-mounted, hand-held, 5-pound, carbon-dioxide-type fire extinguisher shall be provided with a sign above it that reads "FIRE EXTINGUISHER." The sign shall comply with OSHA regulations. The fire extinguisher shall be mounted by the door.
- 2.7.3 One "NO SMOKING" sign shall be provided and installed for every 1,000 square feet of floor space.

2.8 Mechanical

- 2.8.1 HVAC shall be provided 24 hours per day, 365 days per year. A stand-alone wall-mounted split system unit with wireless remote control shall be provided for the equipment. The unit shall be equipped with low ambient controls for year-round application. The temperature range and humidity shall be controlled to provide continuous operating ranges of 64 degrees F to 75 degrees F with 30 percent to 55 percent relative humidity. The ambient temperature and humidity shall be measured at a distance of 5 feet above the floor level, after the equipment is in operation, at any point along an equipment aisle center line. A positive pressure differential with respect to surrounding areas should be provided. The air conditioning shall be sized based on 30 amps per equipment rack (minimum of 5ea per communication room) and 20 amps of usage per dedicated electrical receptacle for misc equipment such as security, DDC, PA systems etc. plus the normal environmental such as lighting. The HVAC unit shall have the highest Seasonal Energy Efficiency Ratio (SEER) rating for approval. The interior wall-mounted unit shall be located at ceiling height, coordinated with lighting, cable runway, and equipment rack placement for optimal efficiency.
- 2.8.2 No piping shall be located above the communication equipment. Any overhead water, steam, drain, or sewer piping shall be removed and rerouted where practical. Insulation shall be provided to prevent condensation, and/or drip pans will be placed below the pipes to divert water away from the electronic equipment when it is impractical to relocate the piping. Sprinkler heads shall have protected cages to eliminate accidental discharge.

2.9 Electrical (Communication Room)

- 2.9.1 A dedicated, **minimum** 50-amp flush-mount power panel shall be furnished and installed in the POP room for service to the communication equipment. This panel shall be referred to as the Technical Power Panel (TPP). No other equipment shall be served from this panel. The feed to the TPP shall be a **minimum** of, single-phase 120/240 volts. The TPP shall provide at a **minimum**, 8ea, 20-amp 120-volt, single pole circuit breakers. The TPP shall be equipped with a neutral bus and a separate ground bus per NEC requirement. The ground bus shall be isolated from the panel tub and equipment ground. Neutral and ground shall be jumpered together in the panel or the transformer, but not both, if this is the first panel served by a step-down transformer. The circuits shall be clearly labeled to identify the equipment and receptacles controlled by each circuit. Individual receptacle cover plates and equipment shall be labeled to identify the circuit that controls it. The locations of the 20 amp dedicated double duplex receptacles for equipment racks are based on the communication room layout, receptacles shall be whip mounted from the ceiling or mounted along the base of equipment racks (whip mounting is preferred). Dedicated 20 amp, 120 volt, duplex, flush mounted receptacles shall be provided for all wall mounted communication equipment (Security, PA systems, DDC, etc. equipment) as required per the building design. 120 volt, 20 amp, three wire grounding type duplex general purpose receptacles shall be provided around the perimeter of the room per NEC. A green ground wire shall be provided. The general purpose or utility receptacles shall be provided every 15 feet of wall space or as required by the local code. There shall be no surface-mounted electrical conduits, junction boxes, or any other electrical components routed on the walls within the POP.
- 2.9.2 Electrical (Communication Closet): At a minimum, three (3) dedicated 20 amp, 120 volt, 1 phase duplex outlets shall be installed per closet. Portable UPS units shall be provided as required. Power feeds provided as indicated above.
- 2.9.3 If an emergency power source is available in the building, the TPP shall be connected to the emergency power supply.
- 2.9.4 An effective telecommunications grounding system shall be placed per ANSI/EIA/TIA stds. Although buildings differ in design and structure, the basic principles, components, and design methods of the telecommunications grounding and bonding infrastructure specified in this standard shall be followed. This standard only applies to the telecommunications grounding system; the building and electrical grounding is outside the scope of this document. The diagram below indicates a typical telecommunications grounding system at the Entrance facility.



A Telecommunications Bonding Backbone (TBB) shall be placed, shall originate at the main electrical service equipment ground bar, and shall extend to the Telecommunication Main Ground Bar (TMGB). The TBB shall also be used to extend the grounding system from the TMGB to the Telecommunication Ground Bar (TGB) required in other intermediate telephone rooms in the building. The minimum conductor size of all TBB conductors shall be a number 6 AWG insulated copper, however, based upon anticipated equipment requirements, a TBB should be sized as a number 3/0 AWG. Each telecommunications bonding conductor shall be green. Each bonding conductor shall be labeled as close as practicable to their point of termination and reference remote connection points. The label shall include the information indicated below. Labels shall comply with EIA/TIA-606 standards.

WARNING
IF THIS CONNECTOR OF CABLE IS
LOOSE OR MUST BE REMOVED,
PLEASE CALL THE BUILDING
TELECOMMUNICATIONS
MANAGER

The TBB shall extend throughout the building, using the telecommunications backbone cable pathways. The TBB shall be installed and protected from damage, in accordance with the requirements set forth in the applicable electrical codes for installation and protection of grounding systems. TBB conductors shall be installed without splices. TBB conductors should not be placed in metallic conduit. If the TBB is run through metallic conduit, it shall be bonded to the conduit at each end. The TMGB shall be a pre-drilled copper bus bar provided with standard NEMA bolt hole size and spacing and shall have minimum dimensions of 6mm thick x 100mm x 300 mm. It is desirable that the TMGB be electro tin plated for reduced contact resistance; if not plated, the bar shall be cleaned prior to fastening of conductors. All metallic raceways, equipment racks, cable runways, cable trays, etc. for communications cabling shall be bonded to the TMGB with green insulated #6 awg. The connection of the bonding conductor for communications and the TBBs to the TMGB shall utilize listed 2-hole compression connectors of exothermic-type welded connections. The TMGB shall be insulated from its support by a minimum of

102mm. The TMGB shall be connected to the vertical building steel and the TPP by using a No. 6 AWG copper conductor. The TMGB shall be located by the TPP, but shall not be located less than 300mm from any DC power cables, switchboard cable, or high frequency cables, even when isolated by metallic conduit or EMT.

2.10 Lighting

- 2.10.1 General area lighting shall be provided for communication rooms / closets to achieve a minimum of 75 foot-candles measured at 3 feet above the finished floor. Fixtures shall be fluorescent and shall be located above communication equipment and coordinated with equipment foot print for maximum lighting. In case of power outages, emergency lighting must be provided. Lighting fixtures shall be no closer than 12 inches to equipment racks/cabinets or cable support structures. Lighting fixtures shall not be powered by the same electrical distribution panel (the TPP) as the telecommunications equipment in the room. Dimmer switches shall not be used.

2.11 Entrance Facility Pathway

- 2.11.1 A service entrance pathway shall be provided from outside the building to the Entrance Facility (EF) or combined EF/Communication Room. The recommended entrance facility pathway should have a **minimum** of 2 - 4" concrete encased conduits, 4-4" for larger facilities per standards. The conduit shall be placed as straight as possible. Where bending is required, no bend will be less than a 40" bend radius. The sum of all the bends shall not exceed 180 degrees between pull boxes or maintenance holes. Distances between pull boxes or maintenance holes shall not exceed those in figure 9.3-2 of FIPS 175 or max. 400' whichever is shortest. Underground conduit entering the building shall slope at least 0.125" per foot away from the building.

2.12 Equipment Rack

- 2.12.1 All Entrance Facility/ Communication Rooms shall as a minimum have 4 each open 19" aluminum equipment racks unless otherwise noted. Equipment racks are shown on the drawing for reference only. In addition to this minimum requirement, the Communication Room design shall provide adequate clearances for an additional secure 24" x 38" equipment enclosure (future).
- 2.12.2 Equipment racks shall be Chatsworth or equal, part number 55053-X03, 19"W x 7'H, 45 RMU clear, with vertical management DBL section to one side, part number 14831-X03, 6"W x 13.52"D X 7'H unless indicated otherwise.
- 2.12.3 Equipment racks may not be required in communication closets.

2.13 Cable Runway

- 2.13.1 Cable Runways shown on the drawing are min 12" Chatsworth Telco style cable runway .
- 2.13.2 Cable Runway may not be required in communication closets.

2.14 Equipment Cabinets (NMCI)

- 2.14.1 When NMCI equipment cabinets are required, they shall be:

LIEBERT Foundation Model HK883000KA197, 25"W X 38"D X 78.5"H, Heavy Duty 12 gauge steel const. painted black, w leveling feet & grd lugs. The cabinet shall contain full height adjustable position, EIA hole/spacing internal mounting rails, front/rear rails-2 sets (left/right) mounting rails, square holes for cage nuts.

Cooling Options: Fan Package-enhanced primary cooling, axial fan w/cord conn. Or FAN2000L 60 Hz Dual low noise fan.

Enclosure Options: Plexiglas Front Door-sheet metal frame const. w/ smoked acrylic viewing area. Mule-point latching & key lock, removable & reversible.
Preformed Rear Door - Sheet metal const. w/perforated sheet metal ventilation inserts. Multi-point latching & key lock, removable & reversible. Side Panels-Sheet metal const. externally removable w/ internal security provisions. Door and Side Panel Color Z-0350.

Power Distribution Options: Two (2) 10 NEMA 5-15 output receptacles; 15A/120VAC, 15' cord, Non Locking NEMA input plug.

General Enclosure Options: Casters-Non Locking, rated 1000lbs total.

Mounting Options: All field installed; including mounting hardware and installation instructions. For use with Front & Rear Internal Mounting Rails. Two (2) Mounting Clip nuts and screws 10/32 - Set of 10 Two (2) Mounting Clip nuts and Screws 10/32 - Set of 10.

- 2.14.2 The Contractor is responsible to coordinate with NMCI POC on **every project** to determine if an NMCI enclosed equipment cabinet is a requirement. The Contractor shall provide written documentation to the government, demonstrating they have met with, coordinated with, and are meeting all NMCI requirements.
- 2.14.3 In place of equipment cabinets in communication closets, contractor may be required to install a wall-mounted equipment cabinet. When required, the contractor will coordinate with NMCI and the government based on the facility and size requirements.