

## 1.0 GENERAL

The purpose of this section is to define the design guidelines for communications hub facilities for the local BSU campus and remote BSU campuses, and to evaluate the spaces suggested as hub facilities for the local BSU campus and to propose alternate spaces where the suggested spaces do not satisfy the design guidelines.

In general, the communications hub facility is the location serving as a central point for distribution of communication services. The hub facility will distribute most types of communications services (e.g., voice, data, video and telemetry) to the outlying buildings served from that hub location.

Design guidelines for a hub facility are more stringent than those of a typical telecommunications closet since loss of equipment and service from a hub facility affects multiple buildings and multiple functions. The guidelines identified below are minimum design guidelines tailored to the University's specific communication needs and operational requirements.

## 2.0 COMMUNICATIONS HUB DESIGN GUIDELINES

The following design guidelines are the basis upon which the suggested and proposed communications hub facilities were evaluated and selected.

### 2.1 General

- A. A communications hub facility is a location serving as a central point for distribution of communication services. The facility serves multiple buildings.
- B. The communications hub facility shall be a suitable space for termination of the outside cable plant to its outlying buildings and operation of communication equipment for communication services.
- C. It is not necessary to co-locate the communications hub facility with the main copper distribution locations on campus (e.g., the Heat Plant and the Engineering Technology Building).
- D. A hub facility may be active (containing communications equipment) or passive (does NOT contain communications equipment). However, passive hub facilities shall be selected and designed to be capable of housing communications equipment.

### 2.2 Location & Size

- A. Multiple communication hubs are necessary to serve the local BSU campus.
- B. Square footage of the hub room is derived from both the quantity of buildings to be served (both existing buildings and potential buildings in the geographic serving area) and anticipated communication services.
  1. Minimum room size shall be 144 square feet. The smallest wall-to-wall dimension of the space shall be no less than 8 feet.
  2. This space shall accommodate three 19" x 7'-0" equipment racks placed side-by-side with cable management between the equipment racks (total of 8'-3").

3. Ceiling height shall be no less than 8'-6".
- C. Communication hub locations are influenced by cable plant topology, availability of adequate space and utilities within buildings, the quantity of buildings served, suitable access to underground ductbank, and construction costs. Following are significant considerations in identifying communication hub locations:
1. Use permanent walls (i.e., outside walls, structural walls, etc.). Consider capability for future expansion of the space. Walls and doors should satisfy a one-hour fire rating, minimum.
  2. Locate the communications hub on grade or one floor above grade if possible. If located below grade the space must not be susceptible to flooding.
  3. Where practical, the communications hub should be located within 50 feet of the building penetration of the ductbank for the communications cable plant.
  4. The communications hub space should be enterable from a common space such as a corridor, or mechanical room, etc. The door should swing out if permitted by building codes and the door opening should be 3'-0" x 7'-0".
  5. Communications hub space shall not be susceptible to moisture entry.
  6. Communications hub space shall not be shared with other functions such as custodial services, electric power distribution, storage, or mechanical equipment.
- D. The communications hub space should accommodate pathway entry at ceiling level for distribution of cables. It is preferable to NOT have a suspended ceiling in the space.
- E. All walls used to route cable, support equipment, and hardware within the communications hub space should be covered with 3/4" A-C plywood to a height of 8'-4" (above finished floor) A.F.F. The bottom edge of the plywood should be 4" A.F.F. The plywood shall be painted white with fire retardant paint although fire rated plywood is not required.
- F. There shall be at least four, 2-lamp fluorescent fixtures in the space or the equivalent illumination. Placement of the fixtures shall be coordinated with the layout of communications hardware (e.g., equipment racks, ladder rack, etc.). Lighting shall be a minimum of 50 foot candles measured at 3 feet above finished floor in middle of aisles.
- G. Floor covering in the communications space should be light color tile. The floor should be in good physical condition.

### 2.3 Security

- A. The space shall be keyed for a "telecommunications key". The key may be an electronic key (e.g., Diebold) or standard metal key.
- B. An alarm system for the communications hub space should NOT be considered (at this time) although monitoring of the space may be applicable.

- C. Other security exposures shall be identified and means of securing access proposed (e.g., windows and other doors into the space).

## 2.4 Power

- A. The communications hub facility provides communication services to multiple buildings. Uninterrupted stable power for the equipment shall be available. An alternate power source (e.g., generator power) shall be available for both communications equipment and environmental equipment and lights. Depending on the power load and quantity of devices, communications equipment may be powered from a local portable uninterruptible power supply (UPS). As the power load and quantity of equipment increases, a central UPS may be more efficient.
- B. Where equipment contains two power supplies, one power supply is powered by a UPS and the second supply is powered from commercial power. Power strips are placed at the equipment racks for distribution of UPS and building power.
- C. Each wall in the communications hub space shall have at least one power double-duplex outlet (20 amp, 110 volt receptacles) for convenience purposes.
- D. The minimum power requirements for communication equipment is one double duplex outlet on each wall, 20 amp receptacles (NEMA 5-20R) with a 20 amp circuit to each receptacle, separate neutrals to each circuit (one plug for UPS, two plugs for power strips for commercial power), and separate equipment (green-wire) ground. Placement of receptacles to be determined during design.
- E. A 100 amp, 3-phase, 120/208V, power panelboard should be installed in each hub facility. All electrical receptacles, lights, air conditioning equipment, etc. shall be served from the panelboard.
- F. The power panelboard should be protected by surge protection equipment.

## 2.5 Mechanical Systems (HVAC)

- A. The room temperature shall be automatically controlled to maintain a constant temperature 24 hours per day, 365 days per year. The thermostat shall reside in the room. The mechanical system should take advantage of outside air where possible. All air supplies shall be filtered.
- B. The adjustable temperature range of the room shall be 65 to 72 degrees Fahrenheit.
- C. Window air conditioners shall not be used as a cooling method.

## 2.6 Pathways for Outside Plant Fiber

- A. Pathways should enter the communications hub space through the floor or through the wall near the ceiling.
- B. Cable rack should be placed around the room to support communications cable. Placement of the cable rack and sizing will be determined during design.
- C. Cable tray is the preferable pathway for routing cable through the interior of the building to the communications hub space. Conduit may be necessary to satisfy the electrical code.

## **2.7 Communications Grounding**

- A. The communications hub space shall be equipped with a main grounding busbar for communications equipment and hardware bonding.
- B. The busbar shall be bonded to the building service entrance ground with a 3/0 insulated copper conductor.

## **2.8 Standards and Codes**

- A. All work shall be in accordance with National and State laws, ordinances, and regulations.
- B. The following Communications Performance Standards shall be applied:
  - 1. ANSI/TIA/EIA 568-A Commercial Building Telecommunications Cabling Standard.
  - 2. ANSI/EIA/TIA 569-A Commercial Building Standard for Telecommunications Pathways and Spaces.
  - 3. ANSI/TIA/EIA 607 Commercial Building Grounding and Bonding Requirements for Telecommunications.
- C. The following codes and practices shall be applied. The version of the codes shall be the one adopted by the State of Idaho, Division of Building Safety and the State Fire Marshall:
  - 1. NFPA 70 - National Electrical Code (NEC)
  - 2. ANSI/IEEE C-2 National Electrical Safety Code
  - 3. Uniform Building Code
  - 4. Uniform Fire Code
  - 5. Uniform Mechanical Code
  - 6. Building Industry Consulting Service International (BICSI), Telecommunications Distribution Methods Manual (TDMM)