PART 1 – GENERAL

1.01 DESCRIPTION

A. The work covered by this section of the Specifications includes all labor necessary to perform and complete such construction, all materials and equipment incorporated or to be incorporated in such construction and all services, facilities, tools and equipment necessary or used to perform and complete such construction. The work of this section shall include, but is not limited to, the following:

1. Basic telecommunications room requirements in accordance with relevant codes and best industry practices.

1.02 QUALITY ASSURANCE

A. Refer to Section 27 00 00 for general details.

1.03 CODES, STANDARDS, AND GUIDELINES

A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations in Section 27 00 00.

1.04 SUBMITTALS

A. Refer to Section 27 00 00 for general details.

B. Shop Drawings:

1. None Required

C. Submit Manufacturer’s Cut Sheets for the following:

1. Any products not specifically listed in the PRODUCTS section shall require a submittal of the manufacturer’s cut sheets.

1.05 IDENTIFICATION

A. All electrical outlets are to be labeled as to Panel and Circuit ID.

B. Refer to Section 27 05 53 for general details.

1.06 DEFINITIONS

A. N/A
1.07 WARRANTY

A. Refer to Section 27 00 00 for general details.

1.08 TELECOMMUNICATIONS ROOM REQUIREMENTS

A. Location

1. The length of horizontal cable from each telecommunications room shall be a maximum of 270 cable feet.

2. The ideal placement of a telecommunications room will be such that all served outlet locations are within 150’ of the room.

3. Telecommunications rooms shall be located as close as is practical to the center of the area being served.

4. Telecommunications rooms must be accessible from a public hallway or other common area.

5. In multi-floor buildings, each floor is to be served by a dedicated telecom room located on that floor. Ideally the telecommunications rooms should be stacked vertically.

6. Telecommunications rooms shall be located so they are not restricted by building components that limit expansion or access (e.g., elevators, core, outside walls, fixed building walls, mechanical and electrical equipment rooms).

7. Telecommunications rooms shall be located so as not to be a flood threat. For example, locations that are below or adjacent to areas of potential water hazard (e.g., restrooms and kitchens) shall be avoided. Additionally, areas having floor drains shall be avoided.

8. Telecommunications rooms shall be located away from sources of electromagnetic interference (e.g., electrical power supply transformers, motors, generators, X-Ray/MRI equipment radio or radar transmitters).

B. Location (Building Service Entrance Specific)

1. The BSE should be nearest the point of entry for conduits entering from the underground.

2. Where possible the entrance cabling should be terminated on a bearing wall to reduce the possibility of relocating the termination space if the building is expanded or altered in the future.

C. Doors & Access

1. Telecommunications rooms shall be located in a publicly accessible area (e.g., hallway).

2. Telecommunications rooms shall be fitted with card reader access control.

3. The door to the telecommunications rooms should be 3 feet wide, opening fully (180 degrees on flat wall, 90 degrees in the corner).
4. Telecommunications rooms shall be keyed to the university’s standard for telecom rooms (Campus BC1 or Housing 725)

5. The door shall be sealed and provided with a door sweep to isolate from outside contaminants.

D. Size

1. Telecommunications rooms are to be a minimum of 10’ x 12’.

2. Telecommunications rooms planned to serve more than 200 network connections are to be a minimum of 10’ x 15’.

3. For telecommunications rooms planned as a BSE in addition to a TR, add 3’ to the length of the room.

4. The size of telecommunications rooms depend on the size of the building, floor space served, occupant needs, services deployed and future growth.

E. Walls & Backboard

1. Each telecommunications space will have all walls covered from one foot above finished floor to 9’ with ¾ inch x 4-feet x 8-feet plywood panels securely fastened to the wall framing members. The screw heads must be flush with the plywood face. The plywood is to be sanded smooth (not rough), void-free and painted with a white fire retardant paint. Paint shall be two coats on all sides (front, back and edges) with exception of the written area on the plywood indicating that it is fire-retardant.

2. Communications room walls shall extend from floor slab to ceiling deck with no drop ceilings. The minimum walls height shall be 10’-0”.

3. Cables that are to be terminated on a backboard will be routed on the ladder around the perimeter to a point directly above or below the termination hardware.

4. Conduit must not be routed across the backboards.

F. Floors

1. Communications room floors shall be sealed and tiled with anti-static tile.

2. Telecommunications rooms shall be located on floor areas designed with a minimum floor loading of 50 lbf/ft²).

G. Ceiling

1. The minimum ceiling height is 10-feet above the finished floor.

2. For TRs with a ceiling distribution system, the ceiling should be open (No false/suspended ceilings) so that there is easy access to the conduit, raceways, cables, etc. entering the TR.

H. Conduit

1. Conduits that protrude through the floor of the TR are to extend 3-inches above the floor surface.
2. Conduits entering the TR through the floor will enter no further than 6" from a wall.

3. One 4" trade size conduit is required (specifically for riser cable) per 50,000 sq ft of usable floor space served by that backbone/riser system, plus two spares for a minimum of three conduits per TR.

4. At least one conduit serving each TR shall have appropriately sized fabric innerduct installed. See Section 27-05-33 for more details.

5. Install mule tape or pull cord in all conduits (even after cable has been pulled).

I. Environmental Service

1. HVAC shall be provided by use of a ducted system, with components placed outside the TR.

2. HVAC shall be included to maintain the equipment within the room. The HVAC shall be continuous (24 hours per day and 365 days per year).

3. Temperature: 60-degrees to 85-degrees Fahrenheit

4. Humidity (non-condensing): 30-percent to 60-percent

5. A positive air pressure shall be maintained with a minimum of one air change per hour.

6. The room shall be protected from contaminants and pollutants that could affect electronic equipment.

J. Fire Detection /Protection

1. All telecommunications rooms should be provided with a portable CO2 fire extinguisher with current certification

2. All telecommunications rooms should be provided with a smoke or heat detector tied into the building’s fire alarm system.

3. Unless required by the AHJ, water charged fire sprinklers are not to be placed in telecommunications spaces.

K. Firestopping & Duct Sealing

1. Any conduits that enter a telecommunications space from the exterior of the building must be sealed at both ends (to prevent vapor from entering) with a product specifically listed for that application.

2. Also refer to Section 27 05 43 for additional detail.

3. All firewall penetrations into a telecommunications room will be sleeved and firestopped. All firestopping must match the specific fire rating of the wall. Products used must be reusable/reenterable to allow for additional cabling and maintenance.
4. Also refer to Section 27 05 37 for additional detail.

L. Lighting

1. Install fluorescent lighting a minimum equivalent of 500 lux (50 foot-candles) measured 1 m (3-feet) above the finished floor.

2. Light switches must be located for easy access upon entry, and are not to be motion sensitive.

3. Locate light fixtures between 9’ and 10’ feet above the finished floor.

4. At least one light should be on emergency power if available.

5. Light ballast cannot be within 1’ of telecommunications cable, and the light fixture itself cannot be within 5”. This is typically an issue around the telecom ladder and cable trays used to route telecom cable.

6. A typical telecom room will include at least two 8’ light rows placed parallel to the racks to illuminate the wiring walls and equipment.

M. Electrical

1. Communications Equipment circuits:
   a. A minimum of two dedicated, protected, non-switched 3-wire 120 volt, 20 amp, NEMA 20R duplex electrical outlets, each on separate branch circuits. Each outlet is to be placed in its own box.
   b. A single dedicated, protected, non-switched 4-wire 120/250 volt, 30 amp, NEMA L14-30R electrical outlet.
   c. Outlets are to be placed on the wall, centered at 6” AFF.

2. Convenience outlets (tools, test sets, etc)
   a. Duplex, protected 3-wire, 120 volt, 20 amp, NEMA 20R non-switched circuits, centered at 6” AFF (below the plywood backboards) and placed at 6-ft intervals around perimeter walls. Convenience outlets should be identified and marked.

3. Do not run conduit for electrical circuits on top of plywood backboards, route around or behind the backboard (inside the wall).

4. Distribution Panels
   a. TRs shall contain their own electrical panel for circuits specific to the equipment within that room.
   b. Distribution panels that serve telecommunications rooms should be dedicated only for that purpose.
   c. If the TR is to support any Life/Safety systems, the room must be placed on building emergency power.
   d. The electrical panel serving a telecommunications space should be grounded to that facilities TMGB or TGB.
N. Shared Use

1. Shared use of any telecommunications room with other building facilities must be avoided. Telecommunications spaces must be dedicated to the telecommunications function and their related support facilities, and must not contain unrelated equipment.

2. Telecommunications rooms may not be shared with building or custodial services, security systems, fire alarm systems, card access systems, servers, non-telecom electrical panels, or building systems.
PART 2 – PRODUCTS

2.01 PRODUCT CONSISTENCY
A. Product Consistency: Any given item of equipment or material shall be the product of one manufacturer throughout the facility. Multiple manufacturers of any one item will not be permitted.

2.02 PLYWOOD BACKBOARD
A. Shall be 4 x 8 x ¾” A/C, fire rated plywood.
B. Shall be painted – white, acrylic, interior, fire-retardant paint.

2.03 DUCT SEAL (POPULATED WITH CABLING)
A. To be used only in situations where a fire rated assembly is not required.
B. Shall be Asbestos Free, easily formable clay.
C. Shall not dry hard, shall be reenterable/reusable.
D. Shall be Resistant to water, alcohols, solvents & fuels
E. Shall be non-corrosive to metals or plastics and a non-irritant to skin.
F. Manufacturer/Product: Gardner Bender DS-130 or approved equal

2.04 DUCT SEAL (UNPOPULATED CONDUITS)
A. To be used only in situations where a fire rated assembly is not required.
B. Shall be removable and reusable compression type fittings.
C. Shall be corrosion proof, water-tight and gas-tight.
D. Shall be equipped with a rear side pull rope tiedown
E. Manufacturer/Product: Osburn Associates Inc, Part Number: 40D402U
PART 3 – EXECUTION

3.01 GENERAL
   A. Refer to other Division 27 specifications for specific execution instructions.

3.02 QUANTITIES
   A. Quantities of system elements shown on the drawings are illustrative only and are meant to indicate the general configuration of the work. The Contractor is responsible for providing the correct quantities of materials to construct a system that meets the intent of these Specifications and the relevant codes.

3.03 INSTALLATION
   A. Follow manufacturer’s complete instructions for installation and configuration of all used products.

3.04 GROUNDING & BONDING
   A. All telecommunications rooms are to be provided with a telecommunication grounding busbar (TGB).
   B. All equipment, racks, metal conduit, cable tray and cable shields will be properly bonded to the TMGB or telecommunications grounding busbar (TGB) as appropriate.
   C. The electrical panel serving a telecommunications room should be grounded to that facilities TMGB or TGB.
   D. All metallic conduits entering or exiting the TR shall be bonded to the TGB with a minimum #6AWG copper wire.
   A. Refer to Section 27 05 26 for additional details.

3.05 TESTING
   A. Devices are to be tested as part of the required system testing for the cabling they support.

3.06 ACCEPTANCE
   A. Once the installation and testing has been completed and the campus telecommunications representative is satisfied that all work is in accordance with the Contract Documents, the representative will notify the Contractor and/or campus project manager in writing or via email.

3.07 RECORD (ASBUILT) DRAWINGS
   A. None Required

END OF SECTION
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