SECTION 271100- COMMUNICATIONS EQUIPMENT ROOMS

SECTION 271100 - TELECOMMUNICATION SPACES

PART 1 – GENERAL

1.1 TELECOMMUNICATION SPACES DESCRIPTION

A. The telecommunication spaces include the Entrance Telecommunication Room (ETR) and the Telecommunication Room (TR). The telecommunications space is an enclosed architectural space for housing communications cabling, cable terminations, and cross-connect hardware and telecommunications electronics. This section will cover all the requirements for physically constructing the room and locating it within the building that it services. In addition it will cover how to configure the room's layout to accommodate the services that these spaces will provide.

1.2 RELATED DOCUMENTS

A. BICSI Telecommunications Distribution Methods Manual (TDMM), Thirteenth Edition.
B. LSU's Policy Statement – PS114.
C. Section 260526 – "Grounding and Bonding for Communications Systems.
D. Section 270528 – "Pathways for Communications Systems."
E. Section 271300 – "Communications Backbone Cabling."
F. Section 271500 – "Communications Horizontal Cabling."
G. Appendix A

1.3 DEFINITIONS AND ACRONYMS

A. BICSI: A professional association supporting the information technology systems (ITS) industry.
B. Cross-Connect field: A facility enabling the termination of cable elements and their interconnection or cross-connection.
C. IDC: Insulation displacement connector.
D. POTS: Plain Old Telephone Service. Used to describe traditional analog voice service.
E. Work Area Outlet: A connecting device on which horizontal cable terminates opposite of the Telecommunications Room (TR or ETR).
F. RCDD: Registered Communications Distribution Designer
G. Entrance Telecommunications Room (ETR): An enclosed architectural space for housing telecommunications equipment, cable terminations, and cross-connect cabling. This room is where outside communication services enter the building.
H. ITS: Information Technology Services
I. UNI: University Networking and Infrastructure

1.4 ADMINISTRATIVE REQUIREMENTS

A. COORDINATION OF WORK
1. The use of space within the ETR and TR is dictated by LSU's policy statement PS114 and simply put dictates that "**nothing other than ITS equipment, cables and cross-connects shall be allowed in ETRs or TRs**." The policy statement states that LSU's ITS must comply with the "Security of LSU's Computing Resources" and that it is

"necessary to minimize the possibility of unauthorized access to protected information and the University's information technology infrastructure."

2. Although a general diagram of the layout of the ETR & TR is given in Appendix A Figures 1 & 2, the sub-contractor for the telecommunications work shall coordinate with LSU Information Technology Services the configuration and layout of the ETR and TR prior to any equipment, cables, terminations or cross-connections being installed.

PART 2 - PRODUCTS

2.1 BACKBOARDS/ WALL LINING

A. Plywood, 4' x 8' x ¾" A/C grade with A side out. The plywood shall be fire-rated and the label that proves the rating shall be exposed and visible after the board is installed. If the plywood is required to be painted, it shall be finished in a light color to increase illumination (this paint does not need to be fire retardant). Comply with requirements in Section 099123 "Interior Painting" for painting backboards. DO NOT paint over manufacturer's label that proves the backboard is fire-rated.

2.2 EQUIPMENT RACK / FRAME

A. 2-Post Rack
B. 4-Post Frame
C. Racks and frames are to be constructed of aluminum and black in color.
D. Seven (7') foot high, nineteen (19") inch wide, and 29" deep rack space (for 4 post frame).
E. Panel mounting holes are to be #12-24 tapped on EIA-310-D universal spacing on both front and rear of rack/frame. Square mounting holes are not allowed.
F. Rack mounting units are to be marked and numbered on the channels.
G. The rack/frame must be self-supporting with base suitable to floor mount.
H. Must be equipped with the proper grounding lugs to assure proper grounding and bonding of the rack.
I. Chatsworth, 4-post, Black, frame(or approved equal)
   1. Part Number 50120-703
J. Chatsworth, 2-post, Black, Rack (or approved equal)
   1. Part Number 55053-703

2.3 VERTICAL CABLE MANAGEMENT FOR EQUIPMENT RACK / FRAME

A. Metal or plastic, with integral wire retaining fingers.
B. Vertical cable management panels shall have front and rear channels, with covers.
C. Management shall be black in color.
D. Panduit, vertical management, black
   1. Part Number PR2VD06

2.4 LADDER TRAY:

A. Tray is to be constructed of aluminum, at least 12" wide and black in color/

B. Tray must be installed with the proper mounting hardware to securely fasten the tray to the walls and the top of the Floor-Mounted Racks.
C. Must be equipped with the proper grounding lugs to assure proper grounding and bonding of the tray.
D. The ladder tray should be selected to support the amount of cable at a 50 percent fill ratio per ANSI/TIA/EIA 569-A.
E. All the proper accessories to install a complete system will be provided by the contractor.
F. Water fall brackets shall be utilized to transition cable from the ladder tray.

2.5 LABELING

1. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers. Labels shall be made using a mechanical label maker. Permanent marker, ink pen, and/or pencil labels shall not be accepted. All labels shall be permanent; no hanging/paper tags.

PART 3 – EXECUTION

3.1 General Communications Equipment Room Requirements:

A. **LAYOUT:** Room configuration will be laid out in accordance with the Appendix figures 1 thru 5. If any changes are needed to the basic flow and layout of the rooms, then the contractor's RCDD shall coordinate those changes through LSU's ITS department.

B. Telecommunications rooms shall contain communications equipment only.

C. ITS recommends that no Telecommunications Room shall be used as a pass thru for any other building services such as water, gas, exhaust vents, etc., but if it is necessary to do so, then there SHALL BE NO maintenance valves in the TR. If unions are needed in piping, then those unions shall be situated such that none are positioned above any IT electronics devices.

D. **SIZE:** Telecommunication Rooms (TR) shall be sized according to the usable floor space that will be served from that room. These are minimum sizes for TRs and the use of the TR should be considered when determining size. All TRs shall have a minimum ceiling height of 8 ½' above finished floor. Entrance TRs service usable floor space in addition to servicing other TRs and housing special equipment to terminate entrance cables; therefore, the size of the room should be increased by 2ft in both directions (i.e. increase 10ft x 8ft to 12ft x 10ft).

Servicing Area:	TR Dimensions:
5,000ft2 or less	10ft x 8ft
5,000ft2 to 8,000ft^2	10ft x 9ft
8,000ft2 to 10,000ft^2	10ft x 10ft

*If more than 10,000ft^2 of floor space is to be serviced from one TR then consider a second TR or get approval and dimensions from LSU's Information Technology Services-University Networking and Infrastructure.

E. **POSITIONING:** Each floor shall contain a telecommunications room. Telecommunications rooms shall be stacked vertically wherever possible. In general, telecommunications rooms should be placed centrally in the building. Central location of telecommunications rooms reduces the length of cable to each workstation. If there will be more than one telecommunications room per floor, then they shall be equally distributed away from possible sources of electromagnetic interference such as electric motors or transmitters.

F. **DISTANCES:** Telecommunications Rooms (TR's) shall be located such that the length of the cable installed from the TR to all station terminations served by that room is less than two-hundred-ninety-five feet (295'). If that distance will be exceeded, then a second TR must be located on the same floor. The distance between TR and TR shall not exceed three-hundred-fifty feet (350').

G. **ELECTRICAL SERVICE:** Telecommunications rooms shall contain one double duplex 120V 20A non-switched receptacle for each 6 feet of wall space. Each receptacle shall be wired to an individual 20A breaker and the breaker panel shall be clearly marked with the word "COMMUNICATIONS", the telecommunications room number and the receptacle number. Receptacles should be evenly placed around the telecommunications room, eighteen inches (18") AFF (above finished floor), in accordance with NEC specifications and/or local fire codes. Regardless of TR size a room shall have no less than 2 separate double duplex 120V 20A non-switched receptacle. The Entrance Telecommunications Room shall also contain one 208V 20A non-switched receptacle with a L620 type receptacle, located on wall behind the floor mounted equipment rack. This circuit shall be connected to emergency generator for the building. In ETR and TRs, install at least one double duplex 120V 20A non-switched circuit located behind the floor mounted equipment rack and connect to emergency generator for the building. Coordinate location of power raceways and receptacles with locations of communications equipment requiring electrical power to operate.

H. **HVA**C: Telecommunications rooms will house active electronic components. These rooms must maintain certain environmental conditions. Equip all telecommunications rooms to provide an appropriate atmosphere for these components on a year-round basis. Maintain positive pressure within these spaces with a minimum of one air change per hour. Connect emergency power to HVAC systems that serves the Telecommunications Room.

Heat load – ½ Ton or 6000 BTU

Caution: Connection to the building HVAC system usually does not provide proper environmental control year-round due to the use of this system for heating during the winter. The Telecommunications Room cannot tolerate any heat

I. **LIGHTING:** All telecommunications rooms must be 500 lux (50-foot candles) at a distance of three feet (3') above the finished floor. This lighting must be achieved using long lasting fluorescent lamps. Ceiling lights must be fused on a separate breaker and be provided with a switch located immediately inside the access door to each room.

J. **WALL AND FLOOR PREPARATION:**

1. All telecommunications room (TR) walls must be completely covered with plywood. The plywood will cover the wall from the finished floor to a minimum height of eight feet (8') or to the ceiling.
2. If it is required to paint the plywood, plywood must be painted with a light color to increase illumination. The contractor must make sure that the rating labels / stamps are visible for the Fire Marshall's inspection.
3. Due to dusting characteristics of concrete, all such interior floor surfaces shall be painted or tiled and finished in a light color to increase illumination. Telecommunications rooms will not be carpeted.

K. **ROOM ACCESS:** Door access to the Telecommunication rooms shall be accessible via main hallways and common areas. No TR shall be located such that a technician has to gain access through a secured area or potentially secured area. All Telecommunication rooms shall be keyed with the LSU Facility Services "Best GM201" key. The doors of the TR must swing outward.

3.2 INSTALLATION

A. Comply with NECA 1.

B. Comply with BICSI TDMM for layout and installation of communications equipment rooms.

C. Coordinate layout of all Telecommunication Rooms with the LSU Information Technology Services /University Networking and Infrastructure personnel .

D. Coordinate location of power raceways and receptacles with locations of communications equipment requiring electrical power to operate.

E. The Entrance Telecommunications Room must be equipped with two (2) 19" aluminum relay racks which are anchored to the floor and are supported from the wall with a 12" ladder tray. The tray will be used to support the racks and also to transition communication cables to the rack. No cables will free span from the wall to the rack. This room must be equipped with a Telecommunications Main Grounding Busbar (TMGB) that will be bonded to main building electrical ground, the building protectors for the telephone entrance cable, and the relay racks. All bonding in this room must be accomplished using a #6 AWG stranded copper conductor with a green jacket. The CATV area must contain enough hinged wall brackets for the amount of panels needed. The entrance TR will be laid out in the manner listed in Appendix A figure 1.

F. The Telecommunication Rooms (TR) must be equipped with one (1) 19" aluminum relay rack which is anchored to the ground and supported from the wall with a 12" ladder tray. The tray will be used to support the racks and also to transition the cables to the rack. No cables will free span from the wall to the rack. This room must contain a Telecommunications Grounding Busbar (TGB) which is bonded to the nearest TR or Entrance TR and to the relay rack. All walls must be lined with ¾" AC grade plywood which is fire retardant or painted with two coats of fire retardant paint. All bonding in this room must be accomplished using a #6 AWG stranded copper conductor with a green jacket. The CATV area must contain enough hinged wall brackets for the amount of panels needed. The TR will be laid out in the manner listed in Appendix A figure 2.

3.3 IDENTIFICATION

A. LSU deploys its own labeling scheme. All cabling and terminations shall be labeled as follows:

1. General infrastructure labeling:
Permanently label all terminal strips, junction boxes, pull points and conduit runs as per telephone industry standards and these specifications.

a. Room Numbers: Only room numbers specifically provided and/or approved by the LSU Office of Campus Planning shall be used for labeling; labels utilizing room numbers provided solely by the architect shall not be used.

b. Equipment racks: Label equipment racks, naming the leftmost unit "Rack 1," and incrementally increasing the number by 1 as you move to the right.

c. Patch Panels: Label the patch panels - by row of 24 - in each rack, naming the uppermost unit "1," and incrementally increasing the number by 1 as you move to the bottom. Note: **Do not** number the individual patch panels; **Do** number the individual rows.

2. Equipment room terminations: All Cables and All termination fields shall be labeled.

a. Data outlets: Each data jack shall be labeled. Labels shall be affixed to the patch panel at a point adjacent to the jack being labeled, and include the official far-end room number – no hyphens - followed by a colon, followed by the number of the faceplate which contains the far-end jack. Example: 1103B:2

b. Feeder cables: All cables that feed other communications closets shall be labeled/tagged as to the location of other end of that particular cable. The patch panels or punch downs where that cable is terminated shall also be labeled in the same manner (label cable and termination field).

3. Documentation (Data Cable Labels Only):
The contractor shall provide the LSU Information Technology Services-networking and Infrastructure with both a printed and a software media copy of a Microsoft Excel, Corel,

Quattro-Pro, or Lotus 1-2-3 spreadsheet which documents the installation of data cable labels. The spreadsheet shall contain, at a minimum, information on the labeling on each end of every data cable termination installed in every equipment closet. The format shall be such that each entry for a closet termination shall have in the adjacent column and on the same row, an entry for the work station end of the cable. Label documentation shall be formatted as follows:

a. For the closet end, the column entries shall contain the Official 3 or 4 character LSU Building Abbreviation followed by a hyphen, followed by the Official closet room number - without any hyphens – followed by the Rack Number and a hyphen, the Patch Panel Row Number and a hyphen, and the Patch Panel Row Position Number. For example, for a jack located in CEBA equipment closet E-3106-C-1, Rack 1, Patch Panel Row 2, Patch Panel Row Position Number 23, the column entry would read “CEBA-E3106C1-1-2-23”.

b. The documentation for the work station end of that cable would be placed on the same row in the next column, and would be an exact copy of the label installed in the equipment room rack for that cable. An example, from Section 3.5.B.1 (above) would be “1103B:2”.

B. Comply with requirements in Section 099123 "Interior Painting" for painting backboards. For fire-resistant plywood, do not paint over manufacturer's label.

C. Labels shall be preprinted or computer-printed type.

END OF SECTION 271100