LSUHealthNewOrleans

5/15/2025

Addendum # 2 to Bid 002897

Change the above referenced Invitation to Bid to agree with this addendum.

This addendum must be signed and included with bid submission.

Signature : _____

Clarification: The VC-4 control system is IP based and does not require a physical connection between the VC-4 and any of the devices that are being controlled by the VC-4. IP based communication must be used because there is not a way to provide physical connectivity between the VC-4 and the devices being controlled in LEC 356.

New Item 1:
The audiovisual integrator shall be responsible for creating the custom programming required per the scope of work specified in the bid documents.
This integrator shall have CTS certification.
Due to the potential complexity of the control system, a Crestron Certified Programmer with active certification shall be required to write the programming component of this project.
Due to the potential complexity of the Audio DSP system, a QSC Q-SYS Level One Training certified individual with active certification(s) shall be required to write the programming for the Audio DSP component of this project.
Bidder shall submit the three active certifications with the bid response. Certifications shall be the most current but not more than one year old.

Q. Under the "Controls" section, it states: "The entire system must be controlled with a Crestron VC-4 control system located in the LSUHNO data center." Could you please confirm:

- The location and floor of the LSUHNO data center?
- The approximate distance between data center and the Dean's Conference Room 356?

A. The LSUHSC Data Center is located on the 7th floor of the Resource Center located at 433 Bolivar St, New Orleans, LA. Refer to Clarification above, but distances are as follows:
Lions Eye Vertical Distance – 45'-0"
Walkway Distance – 490'-0"
Resource Center Vertical Distance – 80'-2"

Q. Could you please provide the anticipated schedule or timeline for this project?
A. Entire project should take maximum 60 calendar days which includes 30 days for ordering, 10 days for shipping & receiving of materials, 10 days for installation and 10 days for programming & testing and final completion of any outstanding items. Note that these are maximum days. Shorter time frames are acceptable should equipment arrive early.

LSUHealthNewOrleans

Q. Could you please provide the current Crestron source code for the room?
A. There is no current source code because this is a new installation.

Q. Could you please confirm whether all overhead data and communication cables are required to be installed within conduit or if it is acceptable to route them using J-hooks or an equivalent approved support system under the project specifications?
A. All network cabling will be installed and terminated by LSUHNO.
All network configuration and management will be handled by LSUHNO.
The integrator is responsible for supplying equipment and patch cables for the devices.
The patch cables must comply with the LSUHSC wiring standards attached.

Q. Additionally, if there are any project-specific specifications or guidelines that govern the installation method for these systems, I would appreciate it if you could share those with us for reference.
A. Attached – Wiring Standards

LSU Health
NEW ORLEANS
Department of Information Technology
433 Bolivar Street · New Orleans, LA 70112 · Phone 504-568-6130

Structured Cabling System: Design & Installation Standards

Last Revised: Thursday, December 12th, 2024

Table of Contents

Article I. Revision History

Date	Area of Change	Scope of Change
1/21/2011	Document	Modified document verbiage to specify strict compliance with all LSUHSC requirements.
1/21/2011	Document	Reorganized document to cover all facets of wiring build-outs.
1/21/2011	Article III, Section 3.04	Added "Contractor/Installer Requirements" section to document.
1/21/2011	Article III, Section 3.05	Added "Coordination of Work" section to document.
1/21/2011	Article IV	Revised list of applicable industry standards
1/21/2011	Article V	Added "Preferred Part Number" section to document.
1/21/2011	Article VI	Added "Before you Dig" section to document.
1/21/2011	Article VII	Added "Building Entrance Facilities" section to document.
1/21/2011	Article VIII, Section 8.06	Added "Access Controls" section to document.
1/21/2011	Article VIII, Section 8.07	Added stipulation for no 1st Floor HCs in multi-story buildings due to flooding concerns.
1/21/2011	Article VIII, Section 8.17	Added "Electrical Emergency Disconnect" section to document.
1/21/2011	Article VIII, Section 8.19	Added labeling requirements for conduits and innerduct.
1/21/2011	Article VIII, Section 8.19	Added caveats to prevent electrolysis.
1/21/2011	Article IX, Section 9.02	Removed 6" wide vertical cable management at end of racks.
		Increased vertical cable management between racks to 10" wide.
		Specified that all racks must be grounded.
1/21/2011	Article X, Section 10.04	Added "Special Use Patch Panels" section to document.
1/21/2011	Article X, Section 10.05	Modified layout of data patch panels in racks to better utilize vertical management.
1/21/2011	Article X, Section 10.06	Modified layout of voice patch panels in racks to better utilize vertical management.
1/21/2011	Article X, Section 10.07	Modified layout of telephony patch panels in racks to better utilize vertical management.
1/21/2011	Article XI, Section 11.01	Added installation caveat regarding building infrastructure shall not be used to support horizontal cabling.
1/21/2011	Article XI, Section 11.02	Specified that cable trays must be grounded.
1/21/2011	Article XII, Section 12.02	Added "Splice Points" section to document.
1/21/2011	Article XII, Section 12.03	Added "Service Loops" section to document.
1/21/2011	Article XII, Section 12.05	Specified that intra-building fiber must use 50 micron laser optimized fiber (OM4)
1/21/2011	Article XII, Section 12.07	Added labeling requirements for fiber optics.
1/21/2011	Article XII, Section 12.08	Specified that fiber optic terminations must use fusion splices.
1/21/2011	Article XIII, Section 13.02	Updated data/voice cable colors. Data is blue, Voice is Ivory.
1/21/2011	Article XIII, Section 13.02	Added special purpose cable colors. Purple is networking. Orange is building systems.
1/21/2011	Article XIII, Section 13.05	Added labeling requirements for special purpose cabling.
1/21/2011	Article XIII, Section 13.08	Added "Special Purpose Drops" section to document.
1/25/2011	Article 1	Added "Revision History" section to document.
1/26/2011	Article XII, Section 12.01	Added caveat about pulling tension and bend radius.
1/26/2011	Article XIII, Section 13.01	Added caveat about pulling tension and bend radius.
1/31/2011	Article X, Section 10.02	Added caveat regarding patch panel placement in racks.
2/23/2011	Article III, Section 3.06	Added "Removal of Abandoned Cables" section to document
2/23/2011	Article XIII, Section 13.02	Added requirement for spacing between electrical and data outlets.
4/6/2011	Document	Rewrite to comply with R.S 38:2290

7/16/2012	Article XIII, Section 12.06	Added requirement for contractor to provide "special purpose" patch cables in cross-connect.
7/1/2016	Article III, Section 3.06	Added verbiage that contractor shall check with Network/Facilities prior to removal of abandoned cables.
8/9/2016	Article XII, Section 12.10	Added verbiage about marginal passing test results.
5/30/2017	Document	Revised document due to change in definition of a "Standard Drop"
8/7/2019	Article XII, Section 12.06	Added "Green" for Passive Poe Systems
12/11/20	Article XII, Section 12.02	Added caveat regarding cable splicing.
08/24/22	Document	Revised document including • General document clean-up and format changes • Industry Standards to reference latest standards • Intra-building fiber from laser optimized OM-4 to single-mode fiber. • Rack positioning with minimum clearance. • UTP cabling service loops
3/6/23	Article XIII	Added Preferred Parts List
3/6/23	Article XII, Section 12.15	Added wireless access point enclosure
9/27/23	Article XII, Sections 12.01, 12.07, & 12.15	Updated cabling standard, revised Patch Cables for Yellow to include "AV", and updated keystone module for access point drops
9/27/23	Article XIII	Removed Cat6+ cabling from wiring specs
9/27/23	Article IX, Section 9.06	Revised MC and HC Rack Layout diagrams
9/30/23	Article VIII	Updated MC and HC sample drawings
9/30/23	Article XIII	Added Keystone module for AP drops to preferred parts list
10/9/23	Document	Minor technical changes in various subsections.
12/12/24	Article XI, Section 11.07	Updated Intra-building fiber language to include both single mode and OM4 multimode fiber.

Article II. Definitions, Acronyms and Units of Measure

Section 2.01 Definitions

Abandoned Cable: As defined in paragraph 800.2 of the National Electric Code, any communication cable that is not terminated on both ends at a connector or other equipment and not identified for "For Future Use" with a tag.

Backbone: A facility (e.g., pathway, cable, or conductors) between telecommunications rooms, or floor distribution terminals, the entrance facilities and the equipment rooms within or between buildings.

Cable Run: A length of installed media which may include other components along its path.

Drop: An outlet that can support data, voice, or video applications.

Faceplate: The covering for a cable outlet usually flush mounted into a wall or a termination box mounted to the surface of a wall or floor. Faceplates typically have openings or insert positions for modular jacks.

Horizontal Cabling: The cabling between and including the telecommunications outlet/connector and the horizontal cross-connect.

Horizontal Cross-connect (HC): A cross-connect of horizontal cabling to other cabling, e.g., horizontal, backbone, equipment.

Main Cross-Connect (MC): A cross-connect for first level backbone cables, entrance cables and equipment cables.

Modular Jack: An 8 position 8 conductor (8P8C) connector commonly used to terminate twisted pair cabling. An 8P8C modular connector has two paired components: the male plug and the female jack.

Pathway: A facility for the placement of telecommunications cable.

Standard Drop: A drop in a work area consisting of two color-coded ports and two color-coded wires. Generally, one drop is used to support VoIP phone and workstation and one drop is available for spare.

Structured Cabling System: A complete system of cabling and associated hardware, which provides a comprehensive telecommunications infrastructure. Installations typically include entrance facilities, equipment rooms, backbone cabling, telecommunication rooms, horizontal cabling, and work areas.

Work Area: A building space where the occupants typically interact with computer equipment.

Section 2.02 Acronyms

ACR-F	Attenuation Crosstalk Ratio Far End
ACR-N	Attenuation Crosstalk Ratio Near End
ANSI	American National Standards Institute
AWG	American Wire Gauge
BICSI	Building Industry Consulting Service International
EMI	Electromagnetic interference
EMT	Electrical Metal Tubing
HC	Horizontal Cross-Connect
HVAC	Heating, Ventilation and Air Conditioning
IP	Internet Protocol
ISO/IEC	International Organization for Standards/ International Electrotechnical Commission
ITU	International Telecommunications Union
LSUHSC	LSU Health Sciences Center New Orleans
MC	Main Cross-Connect
NEXT	Near-end Crosstalk
NFPA	National Fire Protection Association
OS1	Optical Single-mode 1
OSI	Open Systems Interconnection
OTDR	Optical Time Domain Reflectometer
PVC	Polyvinyl Chloride
RCDD	Registered Communications Distribution Designers
RU	Rack Units
SC	Subscriber Connector
TGB	Telecommunications Grounding Busbar
TIA/EIA	Telecommunications Industry Association / Electronic Industries Association
UTP	Unshielded Twisted Pair
VoIP	Voice over IP

Section 2.03 Units of Measure

µm	Micrometer or micron
A	Ampere
dB	Decibel
ft or '	Foot
in or "	Inch
kPa	KiloPascal
lx	Lux
V	Volt

Article III. Design and Installation Standards Overview

Section 3.01 Purpose

This document is intended to provide a basic framework for the design specifications and requirements for all structured cabling system installations.

All campus renovations projects to existing work areas and new building construction shall include drawings for each structured cabling system sub-system (if applicable).

This document details the minimum performance criteria for all components which comprise a structured cabling system, including product specifications, design considerations and installation guidelines.

Section 3.02 Caveats

An authorized representative of the LSUHSC Department of Information Technology must approve all deviations from these standards in writing prior to implementation of the deviation.

All structured cabling system installations must be coordinated through the LSUHSC Department of Information Technology.

All construction projects must be approved by and coordinated through the LSUHSC Department of Property and Facilities Management.

The contractor is responsible for ensuring that all products selected are mated to interoperate such that the overall performance capability and usefulness of the structured cabling system is not degraded.

Section 3.03 Scope

This document applies to all LSUHSC facilities including all new construction and renovations to existing facilities or work areas.

These standards shall apply to all work performed by LSUHSC staff, contractors, sub-contractors and technicians.

Section 3.04 Contractor/Installer Requirements

This document is subject to revisions and modifications as necessary to maintain support and compatibility with changing construction techniques and technological developments.

The contractor/installer shall:

- Verify compliance with the most recent revision of this document and all applicable standards.
- Adhere to all applicable building, fire, and/or life safety codes, State laws and industry standards.
- Furnish all labor, supervision, tooling, miscellaneous mounting hardware and consumables for each cabling system installed.
- Remove all trash and debris daily.
- Submit all documentation that is necessary for a manufacturer provided warranty and/or a contractor/installer provided warranty. The warranty terms and conditions and coverage period shall be clearly stated.

Section 3.05 Coordination of Work

Serving as both an Academic Medical Center and a Healthcare Provider, it is often necessary that installations must be scheduled around daily business activities, such as classes and/or clinics.

Therefore, the contractor shall coordinate with the LSUHSC Department of Information Technology so that all necessary work will be accomplished in an orderly and timely manner with a minimal amount of disruption.

Article IV. Applicable Standards

Section 4.01 Caveats

In general, the following standards are to be used as minimum standards.

Compliance with the latest revision and all addenda for each of the applicable standards listed below is required.

In the event of ambiguities regarding requirements, the more stringent standard shall be adhered to. The LSUHSC Department of Information Technology will determine the more stringent standard that shall be adhered to.

Section 4.02 State of Louisiana Standards

State of Louisiana, Division of Administration: Facility, Planning & Control, Guideline Requirements, Specifications and Wiring Diagrams for Communications Cable/Wire and Related Building Facilities

Section 4.03 BICSI Standards

Telecommunications Distribution Methods Manual

Section 4.04 ISO Standards

ISO 9001: Quality Management Systems - Requirements

Section 4.05 ITU Standards

ITU-T G.652.D: Characteristics of a single-mode optical fibre cable

ITU-T G.651: Characteristics of a 50/125 mm multimode graded index optical fibre cable

Section 4.06 NFPA Standards

NFPA 70: National Electric Code

NFPA 75: Standard for the Protection of Information Technology Equipment

NFPA 101: Life Safety Code

Section 4.07 TIA/EIA Standards

TIA/EIA-526: Standard Test Procedures for Fiber Optic Systems

TIA/EIA-568: Commercial Building Telecommunications Wiring Standard

TIA/EIA-569: Telecommunications Pathways and Spaces

TIA/EIA-598: Optical Fiber Cable Color Coding

TIA/EIA-606: Administration Standard for the Telecommunications

TIA/EIA-607: Generic Telecommunications Bonding and Grounding for Customer Premises

TIA/EIA-758: Customer-Owned Outside Plant Telecommunications Infrastructure Standard

TIA/EIA-942: Telecommunication Infrastructure Standard for Data Centers

TIA/EIA-1179: Healthcare Facility Telecommunications Infrastructure Standard

Article V. Underground Excavation

All underground excavations shall adhere to Louisiana Revised Statute (RS) 40:1749.11 to 1749.27.

The contractor shall be responsible for contacting the regional notification centers prior to excavations so that utility providers in the area are properly notified and have adequate time to identify services.

All damages caused by the contractor shall be repaired at contractor's expense.

Article VI. Building Entrance Facilities

Every building should be constructed to allow for diverse entrance paths for telecommunication providers and/or inter-building fiber optic connectivity.

Telecommunication provider paths shall consist of a minimum of two 4″ rigid metallic conduit pathways, fully populated with innerducts and pull-strings, from a hand-hole located on the property line into the building telecommunications room.

Hand-holes shall be a minimum of 24″ wide x 36″ length x 24″ deep.

All non-rated copper or optical cables (i.e. outdoor cable plant) must transition to indoor rated cables within 50′ of building entrance unless they are encapsulated in EMT or rigid conduit.

Pull strings shall be ¼″ 500 lb strength pull rope.

No section of conduit shall be longer than 100′ or contain more than two 90° bends between pull points or pull boxes.

The telecommunications room must have 4′ x 8′ x ¾″ fire-rated plywood installed on the wall near the 4″ conduit penetrations.

A TGB with #6 AWG ground wire to the main power ground for the building must be installed.

The actual point of entrance for all cable paths into LSUHSC facilities must be approved by the LSUHSC Department of Property and Facilities Management.

Article VII. Cross-Connect Design

Section 7.01 General

The Cross-Connect is the room where the horizontal and/or backbone cabling is terminated, and network electronics are installed. Depending on function, a cross-connect may serve as a MC, as an HC, or as both.

TIA/EIA-569 provides a standard for the design and construction of the cross-connect.

Section 7.02 Caveats

All applicable local, state, and federal codes shall be observed for the design of the cross-connect.

The cross-connect shall be dedicated to the telecommunications function and related support facilities.

The cross-connect shall not be shared with electrical installations other than those for telecommunications. Equipment not related to the support of the cross-connect (e.g., piping, ductwork, pneumatic tubing, plumbing, etc.) shall not be installed in, pass through, or enter the cross-connect.

Section 7.03 Asbestos Safety

A review of the current location, extent and condition of asbestos will be required. The construction of the cross-connect shall be such that the safety of the occupants of the building is not jeopardized before, during, or after construction.

If asbestos is determined to exist within the open areas of the cross-connect, sufficient notification shall be prominently displayed so that all people entering the room are informed of the risks of doing so.

Section 7.04 Fire Protection

Fire protection of the cross-connect shall be provided as per applicable code. All sprinkler heads shall be provided with wire cages to prevent accidental operation.

Section 7.05 Entry Door

The entry door shall be a minimum of 36" wide and 80" high, without a doorsill and fitted with a lock.

Code permitting, doors shall swing outward. Otherwise, inward door swing will be determined by the door placement such that the swing of the door opens into the nearest wall.

Section 7.06 Access Controls

Access to each cross-connect shall be tightly controlled and each room shall at a minimum be secured with a high security lock.

If additional security is deemed necessary by the LSUHSC Department of Information Technology, then the installation of proximity readers, electronic door strikes, and request-to-exit motion sensors or similar components shall be required.

Section 7.07 Location

The cross-connect shall be in an accessible area on each floor and shall be located as close as possible to the center of the building or the area being serviced. In multi-story buildings, if possible, there should not be a cross-connect located on the 1st floor to limit exposure from flooding.

All cross-connects within multi-story buildings shall be vertically stacked.

The cross-connect shall not be located adjacent to any electrical, mechanical, or other areas that are likely to emit EMI.

Section 7.08 Sizing

TIA/EIA-568 provides a standard for the sizing of cross-connects in commercial buildings. TIA/EIA-1179 provides a standard for the sizing of cross-connects in Healthcare Facilities.

Cross-connect sizing is generally based on the square footage of the area being serviced. Additional requirements such as density of drops in the service area or additional equipment that must be in the cross-connect may however require additional space.

Refer to table 1 below for the TIA/EIA minimum cross-connect size requirements.

Serving Area (Ft^2)	Minimum Cross-Connect Size
10000	10′ x 11′
8000	10′ x 9′
5000	10′ x 7′
For support of additional services such as AV or Building MC services	10′ x 16′ or larger
Healthcare	10′ x 13′ or larger

Table 1: TIA/EIA Minimum Cross-Connect Sizing

If the floor size to be serviced exceeds 10,000 ft^2 or if distances between the cross-connect and work area exceeds 295′, additional cross-connects will be required.

Section 7.09 Ceiling

For maximum flexibility, a false ceiling shall not be installed. The structural ceiling shall be painted white.

Section 7.10 Walls

A minimum of three walls shall be covered with rigidly fixed ¾″ A-C plywood, preferably void free, 8′ high, capable of supporting attached equipment.

Plywood shall be either fire-rated and/or covered with two coats of fire-retardant paint and shall be installed in a horizontal orientation beginning 4′ from the floor.

All walls shall be painted white to enhance room lighting.

Section 7.11 Flooring

Flooring shall consist of vinyl composition tile, off-white in color.

Section 7.12 Lighting

Fluorescent lighting shall be a minimum of 500 lx (50-foot candles) mounted a minimum of 9′ above finished floor.

Lighting fixtures should not be powered from the same electrical distribution panel as the network electronics installed in the cross-connect.

Dimmer switches shall not be used.

To prevent EMI, lighting fixtures shall be kept a minimum of 18″ away from cable pathways.

Emergency lighting and signs shall be properly placed such that an absence of light will not hamper emergency exit.

Section 7.13 Floor Loading

The cross-connect shall be located on floor areas designed with a minimum floor loading of 2.4 kPa (50 lb f/ft^2).

Contractor shall verify that concentrations of proposed equipment do not exceed the floor loading limit.

If unusually heavy equipment is anticipated, these specifications may have to be increased.

Section 7.14 Penetrations

Penetrations through fire or smoke rated barriers shall be sealed with a fire stopping compound complying with NFPA and State Fire Marshal requirements.

There shall be a minimum of four 4″ slab penetrations per cross-connect in order to reach cross-connects on lower floors. In buildings without a cross-connect on the 1st floor, additional penetrations may be required in the 2nd floor cross-connect to accommodate drops from the 1st floor.

Penetrations shall be placed such that:

- Where a slot is used, it shall have a minimum 1″ curb around the top of the slot.
- Where a sleeve is used, it shall extend 1″ – 3″ above the floor.

Penetrations must be free of sharp edges so that cables will not be damaged.

Penetrations shall be sufficient to allow access to the main horizontal distribution pathway.

Section 7.15 HVAC

Planning for continuous HVAC (24 hours per day and 365 days per year) shall be included in the initial design.

HVAC shall be designed to maintain the cross-connects temperature the same as the adjacent office area. Ambient room temperature should be between 68° – 72° F.

A positive pressure shall be maintained with a minimum of one air change per hour, or as required by applicable code. When active devices (heat producing equipment) are present, enough air changes should be provided to dissipate the heat. The LSUHSC Department of Information Technology will provide the necessary heat dissipation information for all electronics that will be installed in the cross-connect to determine cooling requirements.

If a standby power source is available in the building, the HVAC system serving the cross-connect should be connected to the standby supply.

Section 7.16 Electrical

As electrical requirements vary by installation, the LSUHSC Department of Information Technology will provide the electrical circuit requirements including receptacle types and locations within each cross-connect prior to construction.

If standby power will be available, automatic transfer switchover of power should be provided.

Outlet faceplates to designate emergency power shall be red in color.

Outlet faceplates to designate building power shall be gray in color.

Section 7.17 Electrical Emergency Disconnect

Each cross-connect shall have a properly sized non-fusible safety switch disconnect installed, configured such that all outlets within the room are isolated when switched off.

The electrical emergency disconnect shall be mounted on the wall immediately inside of the door such that it is reachable without entering the cross-connect.

Section 7.18 Grounding

Refer to Article XIII for preferred parts list.

As per TIA/EIA-607, each cross-connect shall contain a TGB.

TGBs shall be located inside the cross-connect and be insulated from its support; a 2″ separation is recommended.

TGBs shall be located to provide the greatest flexibility and accessibility for telecommunications system grounding. Multiple TGBs may be installed within the same closet to aid in minimizing bonding conductor lengths and terminating space.

Article VIII. Cross-Connect Build-out

Section 8.01 General

The specifications detailed in the following section are the "general" design requirements for each cross-connect.

Refer to figures 1 through 5 for an overhead, front, and side view showing an example of a typical MC or HC build-out.

Section 8.02 Caveats

Typical designs may need to be modified due to the room orientation, room dimensions, cable entrances facilities, drop density and/or voice and video requirements.

Section 8.03 Racks

Racks shall be at least 7′ in height. Racks greater than 7′ may be needed in areas where higher port density requirements exist.

Racks shall support 19″ rack-mount widths.

RU should be clearly marked on the racks.

A minimum of three racks shall be installed in each HC.

A minimum of four racks shall be installed in the MC.

Racks shall be installed and secured as per the manufacturer's installation instructions.

Racks shall be positioned within the cross-connect to allow access to both the front and rear of all racks. A minimum of 48″ of clearance shall exist between the front of the rack and the wall and the rear of the rack and the wall.

Racks shall be positioned within the cross-connect to allow the entry door to be fully opened.

Racks shall be properly grounded.

Section 8.04 Vertical Cable Management

Refer to Article XIII for preferred parts list.

Vertical cable management shall be a minimum of 10″ wide.

Vertical cable management shall be double-sided to allow routing of cables from both front and rear.

Vertical cable management shall include hinged doors to hide cables.

Vertical cable management shall be installed between each rack in the cross-connect.

Vertical cable management shall be installed and secured as per the manufacturer's installation instructions.

Section 8.05 Cable Runway Installation

Refer to Article XIII for preferred parts list.

Cable runways shall be a minimum of 18″ wide and black in color.

Cable runways shall be installed and secured as per the manufacturer's installation instructions.

Cable runways crossing above racks shall be secured to and supported above each rack using a cable runway standoff support.

Cable runways shall be properly grounded.

Section 8.06 Cable Runway Drops

Refer to Article XIII for preferred parts list.

Cable runway drops shall be installed to accommodate the cable bend radius to transition cable routing from horizontal cable runways and into each of the vertical cable managements.

Cable runway drops shall be mated for 18″ cable runway.

Cable runway drops shall be installed and secured as per the manufacturer's installation instructions.

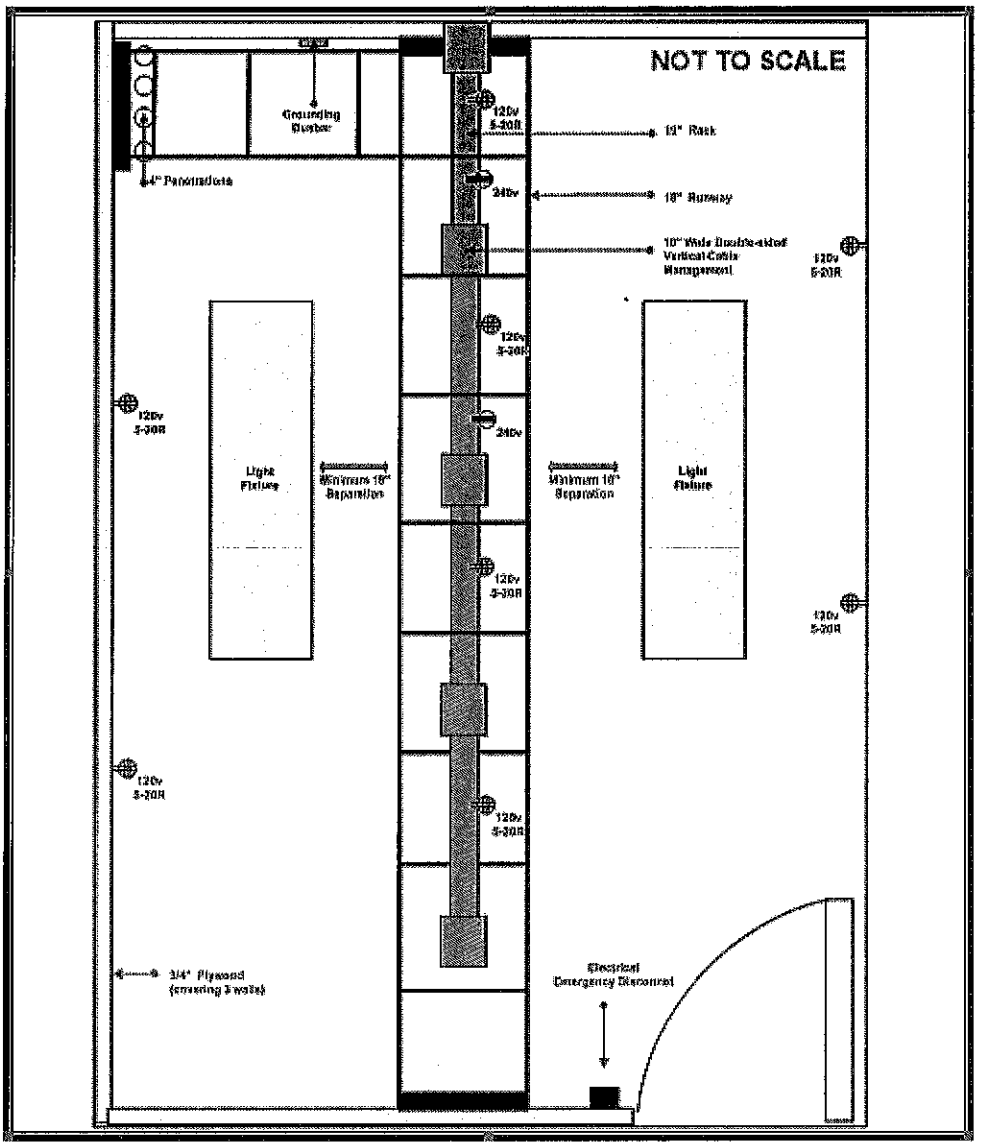


Figure 1: Main Cross-Connect Overhead View

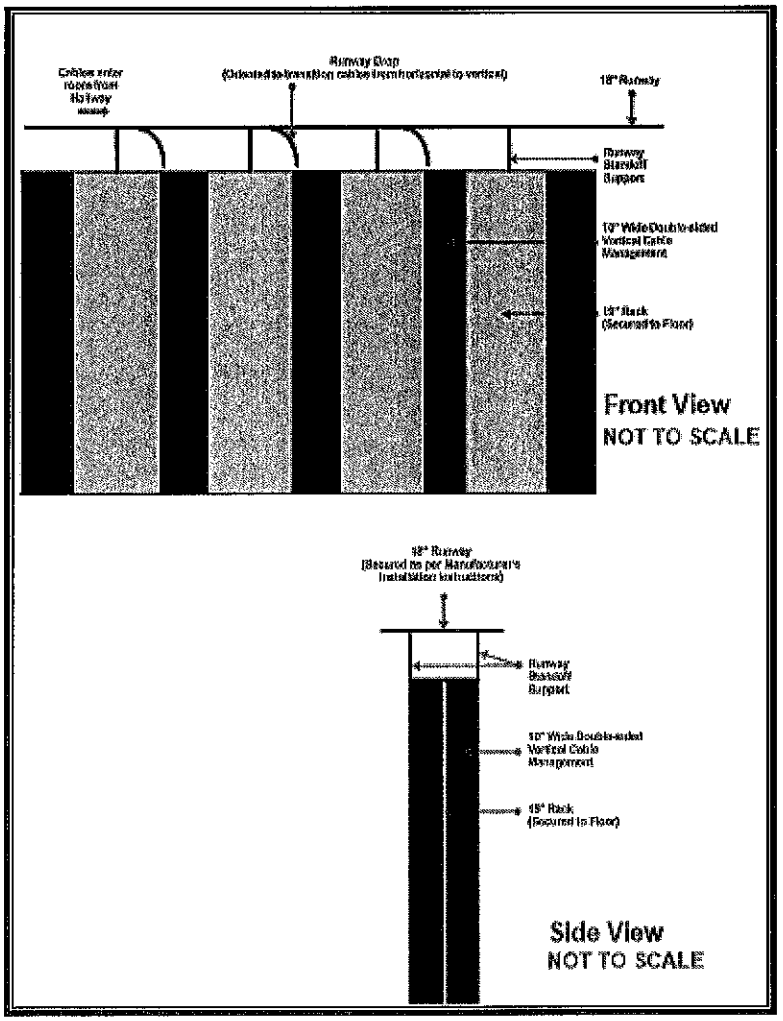


Figure 2: Main Cross-Connect Front and Side View

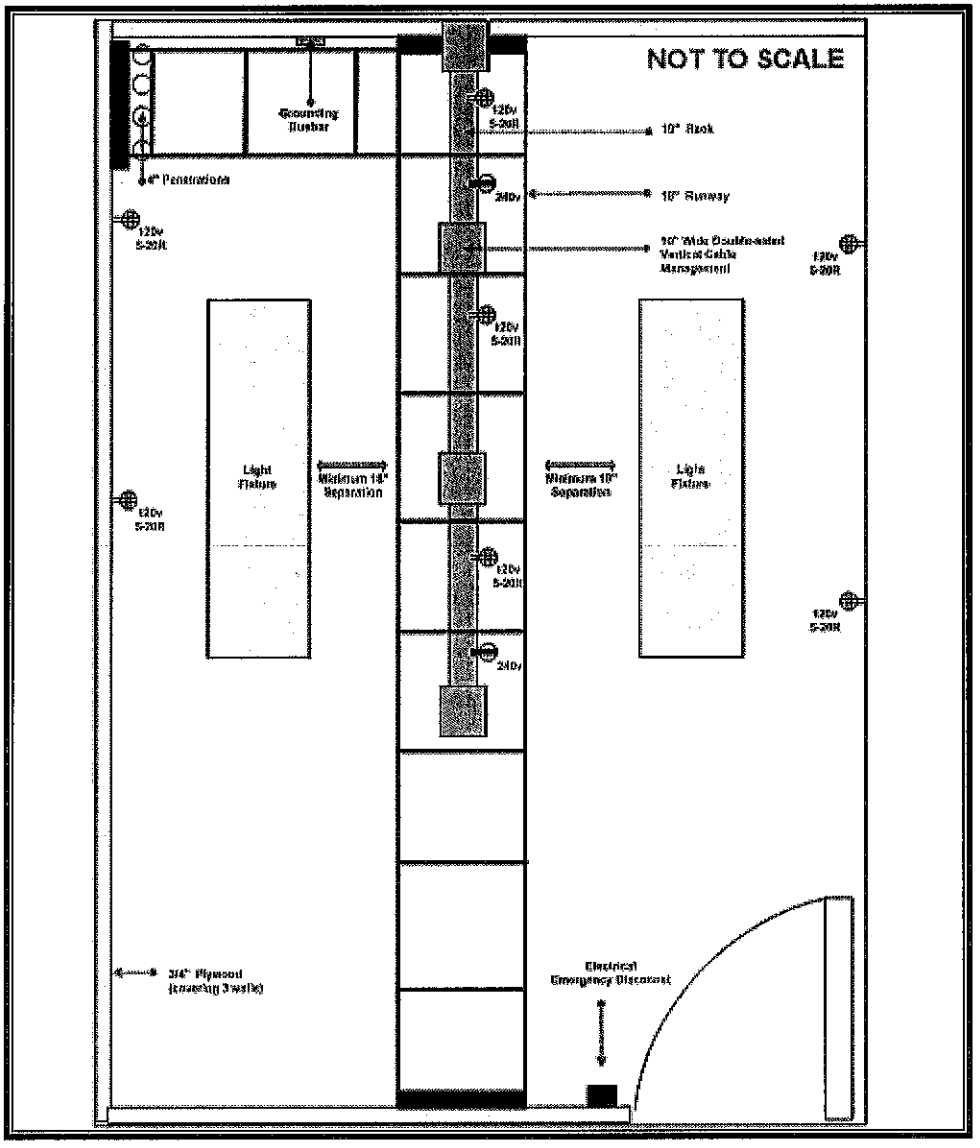


Figure 3: Horizontal Cross-Connect Overhead View

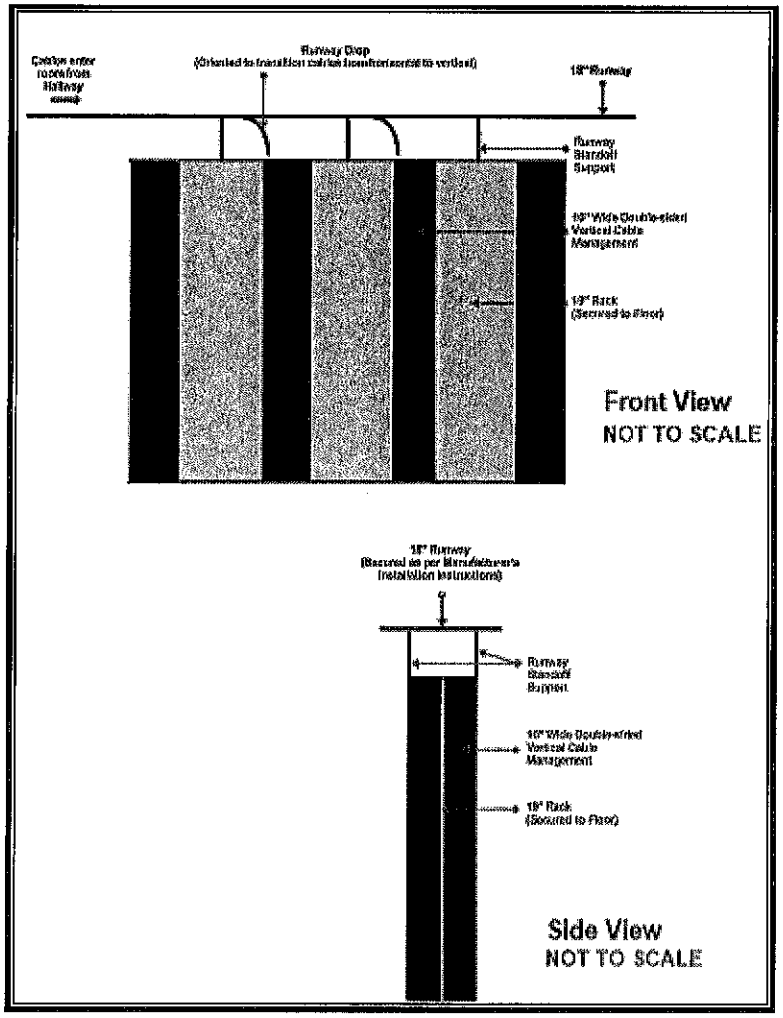


Figure 4: Horizontal Cross-Connect Front and Side View Rack Layout

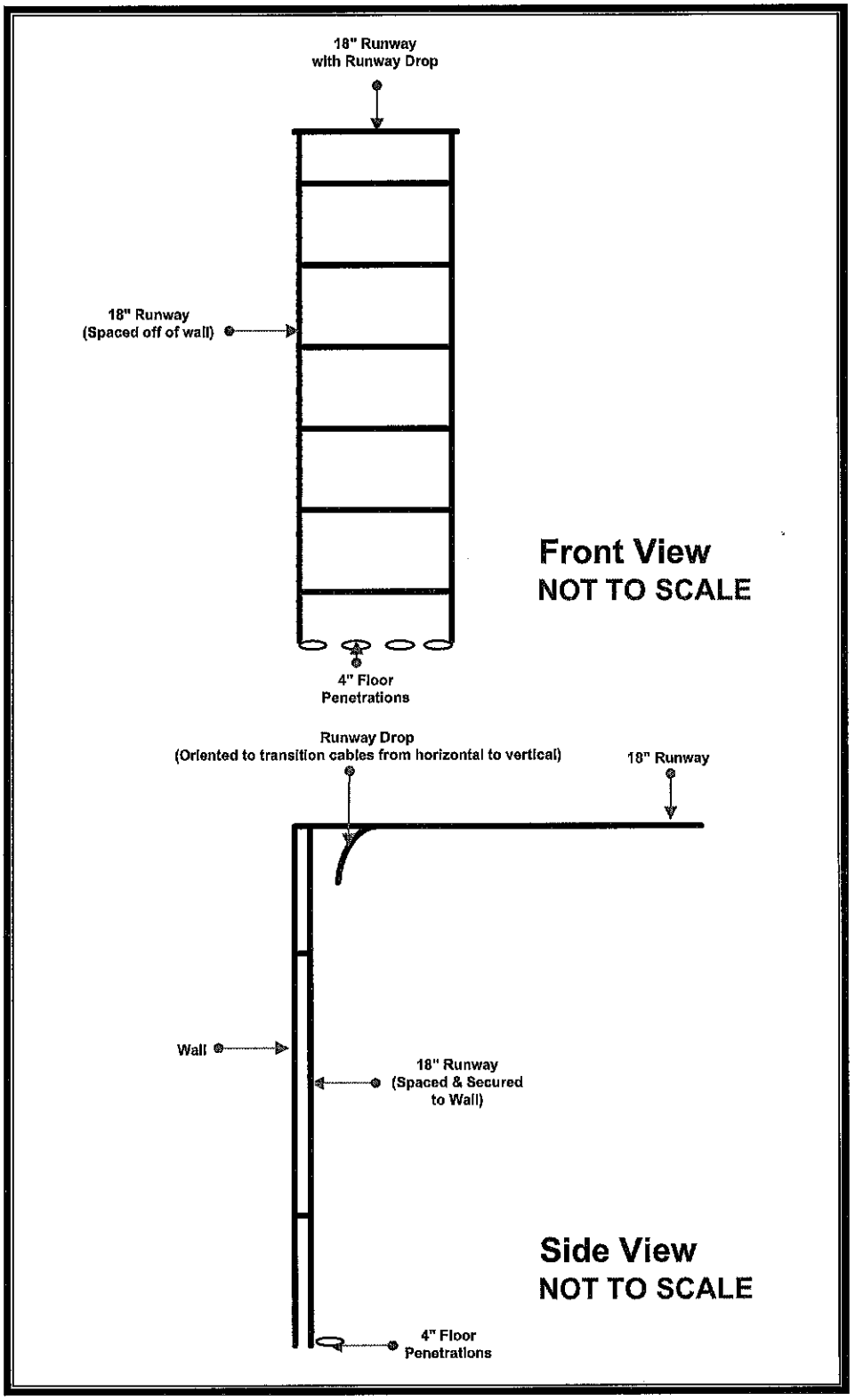


Figure 5: Vertical Cable Management

Article IX. Rack Layout

Section 9.01 General

Each HC build-out consists of a three-rack system.

When facing the front of the racks,

- The left most rack is designated as Data Rack 1.
- The middle rack is designated as Data Rack 2.
- The right most rack is designated as Data Rack 3.

In addition to the HC racks, the MC shall have an additional rack positioned left of the HC racks that will be designated as the Core Network Rack.

Refer to figure 6 for a typical MC rack layout and to figure 7 for a typical HC rack layout.

Section 9.02 Caveats

Typical rack layouts may need to be modified due to the drop types and density. The LSUHSC Department of Information Technology will provide the necessary guidance to installers for the rack layout.

Section 9.03 Fiber Optic Enclosures

Refer to Article XIII for preferred parts list.

Fiber optic enclosures shall be 19″ rack mountable and shall accommodate fiber optic termination capacity for a minimum of 24 strands of fiber optics.

Fiber optic enclosures shall be black in color.

In the HC, install a fiber optic enclosure for the intra-building fiber optics at the top of Data Rack 2.

In the MC, install fiber optic enclosures for inter-building and intra-building fiber optics beginning at the top of the Core Network Rack. Inter-building fiber optics shall be housed in a separate enclosure from Intra-building fiber optics.

If multiple fiber optic enclosures are utilized in the MC for intra-building fiber, fiber optic enclosures should be arranged such that room numbers appear in a descending order from top to bottom.

Fiber optic enclosures shall be labeled with a machine etched hard plastic label.

Fiber optic enclosures labels supporting intra-building fiber shall specify at a minimum the remote room number where the fiber optics terminates.

Fiber optic enclosures labels supporting inter-building fiber shall specify at a minimum the remote building name and room number where the fiber optics terminate.

Section 9.04 Patch Panels

Refer to Article XIII for preferred parts list.

Patch panels shall be 19″ rack mountable.

Patch panels shall have a 24 or 48-port capacity and support modular jacks. Jacks shall be populated in a left to right fashion. Angled patch panels should be utilized unless under the direction of LSUHSC Department of Information Technology.

When possible, cables should be installed in the patch panels in sequence number order to simplify locating specific ports.

Patch panels shall have machine printed labels with plastic label covers. Labeling shall be identical to the respective faceplate in the work area.

Section 9.05 Patch Panel Usage

The LSUHSC Department of Information Technology will specify the organization of the modular jacks across the various patch panels listed below:

(a) Data Patch Panels

Data patch panels shall be positioned beginning in the upper portion of data rack 1 and only installed in data rack 3 if more than (8) 48 port angled patch panels are used in the closet. If more than (16) 48 port patch panels are planned to be installed in a closet, please coordinate with the LSUHSC Department of Information Technology regarding their location. Angled patch panels should be utilized unless otherwise directed by the LSUHSC Department of Information Technology.

(b) Telephony Cross-Connect Patch Panels

A minimum of one 48-port patch panel to support the Analog telephone infrastructure will be installed in the data rack 2 below the fiber optic enclosure.

Details for cross-connect instructions to connect to the telephone infrastructure is outside the scope of this document. Consult the LSUHSC Department of Information Technology Telephony Standards for details on the installation and labeling requirements.

Section 9.06 Horizontal Cable Managements

Refer to Article XIII for preferred parts list.

Horizontal cable managements shall be 19″ rack mountable.

Horizontal cable managements for the purpose of managing patch cable shall have hinged covers.

Horizontal cable managements for horizontal cable shall utilize D rings.

Horizontal cable managements shall be properly sized for the number of cables to be managed.

Horizontal cable managements are not required if utilizing angled patch panels.

Horizontal cable managements shall be installed between all flat patch panels.

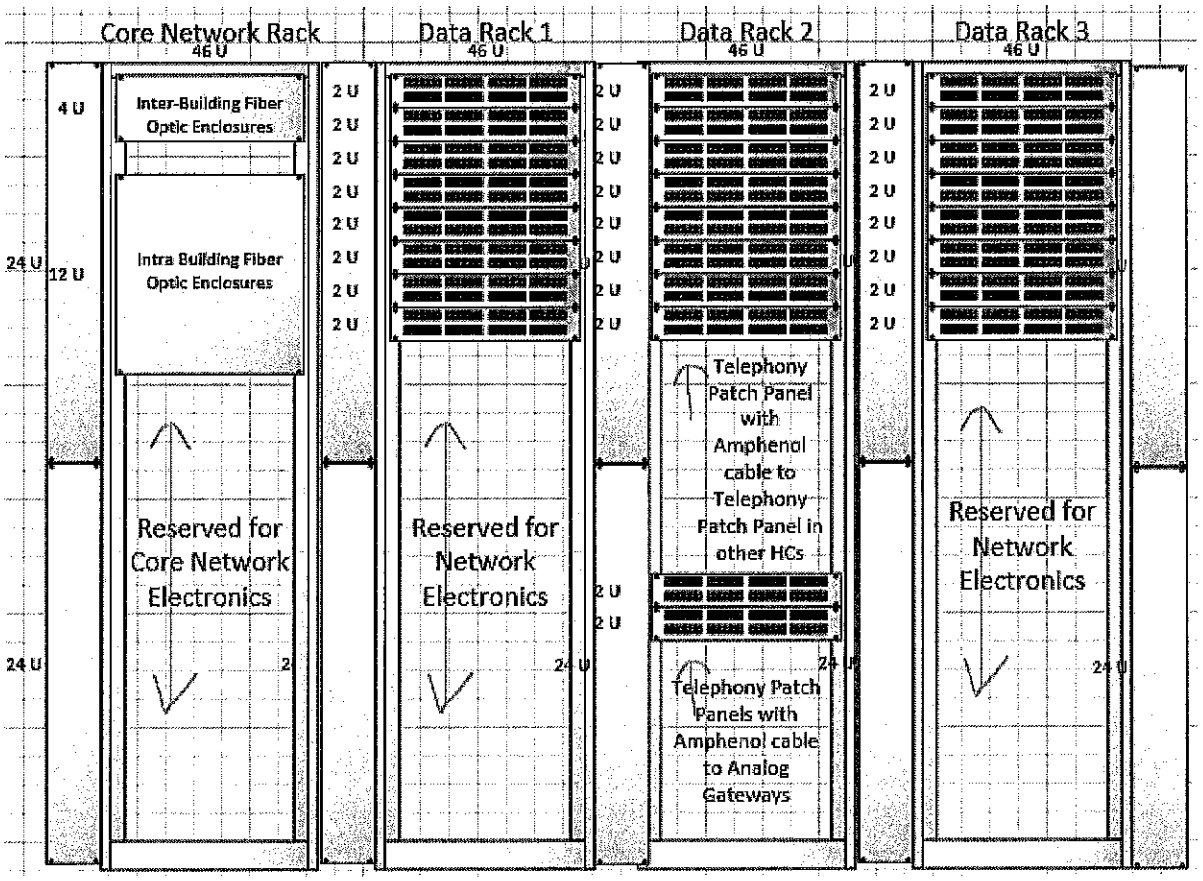


Figure 6: Sample MC Rack Layout

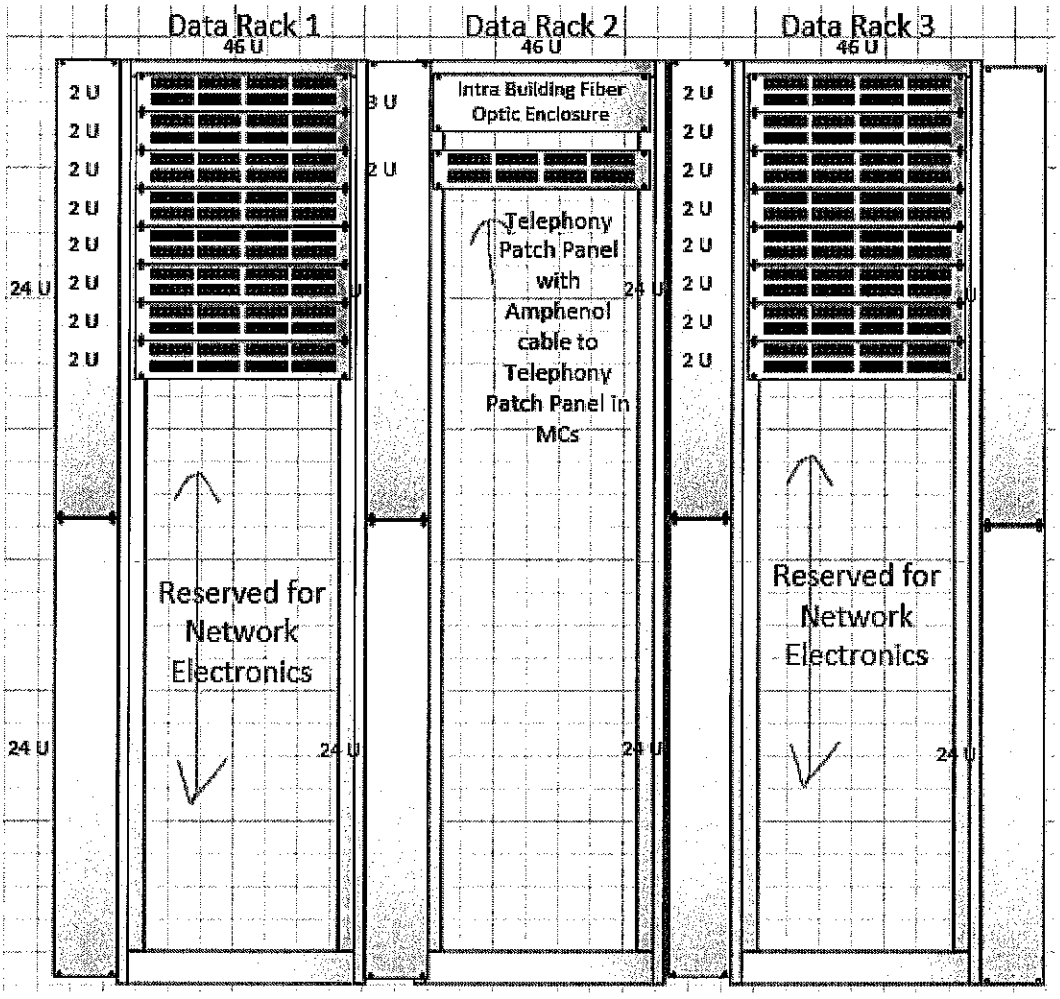


Figure 7: Sample HC Rack Layout

Article X. Cable Pathways

Section 10.01 General

Cable pathways and spaces must comply with TIA/EIA-568 and TIA/EIA-569.

Cable paths shall consist of a primary path above the main hallways of the building with individual drops exiting the main pathways at right angles and suspended by J-hooks towards the top of the wall above the intended drop/faceplate location.

In areas with suspended ceiling tiles, all cabling and support structures should be installed above the ceiling tiles in such a way that will not interfere with the moving or removal of ceiling tiles.

Specific attention should be paid to issues such as:

- Distance requirements for separation from EMI emitting devices and electrical equipment such as fluorescent lighting and power supplies.
- Proper supporting of cables within cable paths to prevent the weight of cables from damaging cable or other equipment.
- Proper conditioning of floor and wall penetrations to prevent damage to cable jackets while installing the cable and throughout the cable life.
- Segregation and separation of cabling in cable trays by media type and then by color of jackets for like media.

Section 10.02 Caveats

All penetrations through fire or smoke rated barriers shall be sealed with a fire stopping compound complying with all NFPA and State Fire Marshal requirements.

In no cases shall any cabling be permitted to utilize building infrastructure for support or to aid in the cable's suspension. Only systems installed specifically for the purpose of routing and managing cabling shall be utilized.

Section 10.03 Abandoned Cables

Abandoned cables increase fire loading unnecessarily and if installed in plenums, can affect airflow. Therefore, the accessible portion of all abandoned communication cables shall be removed.

Prior to removal of any cables, the contractor shall obtain approval from the LSUHSC Department of Information Technology and from the LSUHSC Department of Property and Facilities Management.

Section 10.04 Cable Trays

Refer to Article XIII for preferred parts list.

Cable tray shall be installed in all primary pathways (i.e., hallways).

Cable trays shall be of a wire mesh construction and be a minimum of 4" deep and 12" wide. Fill rates should not exceed 60%.

Cable trays shall be properly grounded.

Cable trays shall be installed and secured as per the manufacturer's installation instructions.

No component of the cable tray system or support structure should be mounted to the suspended ceiling support wires.

Section 10.05 Cable Supports

J-hooks shall be installed in areas where the installation of cable trays is not possible or to support cables between cable trays and user work areas.

The minimum J-hook size shall be 2". Larger sizes, if necessary, shall be determined based on manufacturer's recommendations for the number of cables to be supported.

All J-hooks shall have cable retaining clips installed.

In main hallways, where possible, J-hooks shall be mounted to the wall and spaced every 4′. The distance between J-hooks in overhead areas shall not exceed 5′.

All J-hooks shall be installed and secured as per the manufacturer's installation instructions.

Section 10.06 Conduits and Innerduct

For conduit and innerduct installations, the following best practices should be adhered to:

- Innerduct should be cut and securely fastened at all conduit junction boxes
- All conduits shall use sweeping bends for directional changes
- All conduits, tubings and innerducts shall be securely terminated on both ends with appropriate termination hardware and junction boxes
- Transitions between different types of tubing, conduit and innerduct shall be made with a junction box unless a special adapter designed for such purpose is available
- All empty innerducts and unfilled conduits shall contain pull strings to assist with future cable installations
- Conduit shall have a maximum fill capacity of 50%
- Innerduct may be filled to any capacity that can be achieved with a single pull without damaging the integrity of the cables being installed
- Conduit and tubing shall terminate in junction boxes appropriately sized for the type and quantity of cable being installed
- When using conduit greater than 2″ inner diameter, innerduct shall be used within the entire length of the conduit unless a shielded cable is used
- When 4" conduit is installed, it should be completely filled with innerduct

Conduits and innerducts shall be clearly labeled on the exterior surface, at least every 50′.

Conduits and innerduct labels shall include a unique identification that identifies the origination and destination, such as RCB719-LEC230-1 signifying the 1st conduit originating in the Resource Center Building, room 719, and terminating in room 230 in the Lions Eye Center.

Labeling shall consist of black letters, at least 1.5″ – 2″ high, on a white or yellow background.

Labels should be self-adhesive labels suitable for indoor and outdoor installations.

Conduit sizing shall be based on cable capacity as per the manufacturer's recommendations.

Conduit installations in areas where the presence of an electrolyte, such as water or moisture containing small amounts of acid are likely to be present, appropriate measures shall be taken to ensure that dissimilar metals do not come in contact with one another in order to prevent corrosion of metals.

Refer to the table 2 below regarding metals that corrode when in the presence of an electrolytic and in contact with another metal.

The Galvanic Series			
1	Aluminum	7	Tin
2	Zinc	8	Lead
3	Steel	9	Brass
4	Iron	10	Copper
5	Nickel	11	Bronze
6	Stainless Steel 400 Series	12	Stainless Steel 300 Series

Table 2: The Galvanic Series

Article XI. Fiber Optic Cabling

Section 11.01 General

All fiber optic backbone cabling shall be installed in a star (hub-and-spoke) topology in compliance with TIA/EIA-568.

Section 11.02 Caveats

All fiber optic cables must be installed, handled, routed and terminated as per the manufacturer's installation instructions. Special attention shall be paid to the pulling tension and bend radius limitations for each cable.

Section 11.03 Splice Points

The LSUHSC Department of Information Technology has established two splice points on the downtown campus, each having available single-mode fiber optics, to the Resource Center Building which acts as the hub in the downtown campus star topology.

Splice points are established in the following locations:

- Walk-to-Wellness (East end of walkway in ceiling area of Entergy Garage)
- Walk-to-Wellness (West end in Seton Building Elevator / Mechanical closet)

All new building construction on the downtown campus shall attempt to utilize these existing resources.

Section 11.04 Installation Techniques

Fiber optic cabling must be completely encapsulated for the entire length of the cable run. Acceptable encapsulation types are aluminum armor cladding, innerduct, rigid metallic conduit, electrical metallic tubing, flexible metallic tubing, or other suitable enclosure that meets the requirements of the installation.

Different types of encapsulation materials may be required in different areas to accommodate intra-building, inter-building, or plenum space requirements.

Grounding requirements shall be adhered to for each applicable encapsulation type.

Section 11.05 Fiber Optic Service Loops

Fiber optic cables shall be provided with a 25′ long service loop per end for a total of 50′ per fiber optic cable.

Fiber optic service loops shall be securely mounted to the wall in the cross-connects.

Section 11.06 Inter-building

Inter-building backbone cabling shall consist of a minimum of 24-strands of single-mode fiber optic cabling.

Inter-building fiber shall be indoor/outdoor rated fiber.

Depending upon the geographic location of the building being served, as well as its logical relationship to the campus environment, the number and type of strands may be increased.

Section 11.07 Intra-building

Intra-building riser cabling shall consist of a minimum of 24-strands of fiber optic cabling broken down as 12-strands of single mode (SMF) and 12-strands of multimode (OM4 MMF) fiber, preferably in a hybrid armor.Depending upon equipment in the closets and geographic location of the switches, more strands of fiber may be required to be installed. The LSUHSC Department of Information Technology shall be consulted prior to any fiber installation and purchase.

Section 11.08 Termination

All single-mode and multimode terminations shall have SC connectors.

Section 11.09 Testing

Each fiber strand shall be tested with an OTDR to verify installed cable length and all points of dB loss.

OTDR must have been calibrated within past year by accredited lab or by the original equipment manufacturer. Certification of last calibration date shall be made available upon request.

Fusion splice loss shall not exceed 0.2 dB and connector loss shall not exceed 0.5 dB.

Testing shall be performed in both directions on each strand.

Section 11.10 Labeling

All fiber optic cables shall have a self-laminating plastic tag affixed with tie wraps (plenum or non-plenum as necessary) every 50' unless it the cable is encapsulated in a conduit or innerduct.

All fiber optic cables shall have a cable tag affixed before the cable enters any conduit or innerduct and within any pull box, junction box, or hand-hole where the fiber is exposed.

Fiber optic cable tags shall include a unique identifier neatly printed in a permanent marker.

This unique identifier shall be constructed in such a way as to easily identify the type of fiber optic cable, strand count and origination cross-connect and destination cross-connect. Refer to Figure 8 for a sample fiber optic identifier.

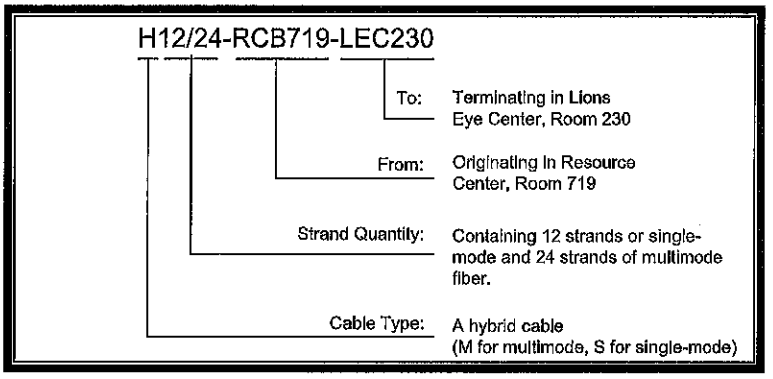


Figure 8: Fiber Optic Identifier

Article XII. UTP Cabling

Section 12.01 General

Refer to Article XIII for preferred parts list.

At a minimum, all UTP cabling components, including cables, connectors, and patch cables, must exceed the ANSI/TIA-568.2-D Category 6A standard. The LSUHSC Department of Information Technology shall be consulted to verify the UTP cabling component requirements for each installation.

TIA/EIA 1179 recommends that healthcare facilities install Category 6A.

Standard colors for UTP cabling have been adopted to easily identify cable usage.

Section 12.02 Caveats

UTP cables must be installed, handled, routed, and terminated as per the manufacturer's installation instructions. Special attention shall be paid to the pulling tension and bend radius limitations for each cable.

UTP cables shall not be painted (oil or water based) or be installed in the presence of water.

UTP cables shall not be spliced.

Section 12.03 Penetrations

All penetrations through fire or smoke rated barriers shall be sealed with a fire stopping compound complying with NPFA and State Fire Marshal requirements.

If conduit is not provided to the outlet box location, all penetrations through office wall top plates should have a collar or similar device installed to prevent damage to the UTP cable jacket.

Section 12.04 Horizontal UTP Cables

The maximum length of a horizontal UTP cable, between the faceplate in the work area and patch panel in the HC, shall not exceed 295'.

UTP cables shall terminate at a patch panel in the cross-connect and at a faceplate on the same floor as the work area being served. UTP cables that terminate in floor boxes and which route through the slab may be terminated on the floor below to avoid distance limitations.

UTP cables shall be colored to easily identify usage as specified in Table 3.

Section 12.05 Horizontal UTP Cable Service Loops

No service loops shall be installed.

Section 12.06 Modular Connectors

Refer to Article XIII for preferred parts list.

Modular connectors shall (as close as possible) match the color of the UTP cable as specified in Table 3.

Section 12.07 Patch Cables

Refer to Article XIII for preferred parts list.

The maximum length of a patch cable in the work area shall not exceed 16'.

The Contractor shall provide appropriately sized patch cable for all cross-connect drops. Patch cables shall be sized to minimize excess cable length in the vertical managements.

The patch cables shall (as close as possible) match the color of the modular connector as specified in Table 3.

UTP Cable / Modular Connector / Patch Cable	Usage
Blue / Blue / Blue	Primary Data
Blue / Blue / Blue	Spare Data
Violet / Violet / Violet	Special Purpose – Networking
Orange / Orange / Orange	Special Purpose – Building Systems
Green / Green / Green	Special Purpose – Passive PoE
Yellow / Yellow / Yellow	Special Purpose – AV

Table 3: UTP Cable / Modular Connector and Patch Cable Color Code

Section 12.08 Faceplates

Refer to Article XIII for preferred parts list.

The color of the faceplates shall match wall colors and shall support a minimum of four modular jacks.

Faceplates mounted on walls shall utilize recessed insert and non-shuttered jacks, installed in a downward facing orientation to prevent the accumulations of dust and debris within the modular jack and on the pin contacts. Installations shall be such that the bottom of the faceplate is parallel to the floor surface and the sides of the faceplate are perpendicular to the floor surface.

All unused faceplate ports shall have blank inserts installed.

Faceplates mounted on horizontal surfaces shall include shuttered modular jacks to prevent the accumulation of dust and debris within the jack and on the pin contacts.

Faceplates shall be separated from Electrical outlets by a minimum of 6″.

Faceplates shall have machine printed labels and plastic label covers. Labels shall be in compliance with TIA/EIA-606.

Faceplates in work areas shall be labeled with the room number, jack number, and the jack position. Refer to Figure 9 for jack positions. If multiple faceplates exist within the same room, faceplates jack numbers shall be sequentially numbered in a clockwise manner. This should begin with the first faceplate to the left of the main doorway as you enter the room. The main doorway is the one that provides access to a common area, such as a hallway or lobby.

Faceplate labels in office work areas shall be white with black lettering. Faceplate labels in public areas (i.e. auditoriums, conference rooms, etc) shall be green with black lettering. LSUHSC Department of Information Technology shall determine areas that are to be considered public areas for the purpose of labeling.

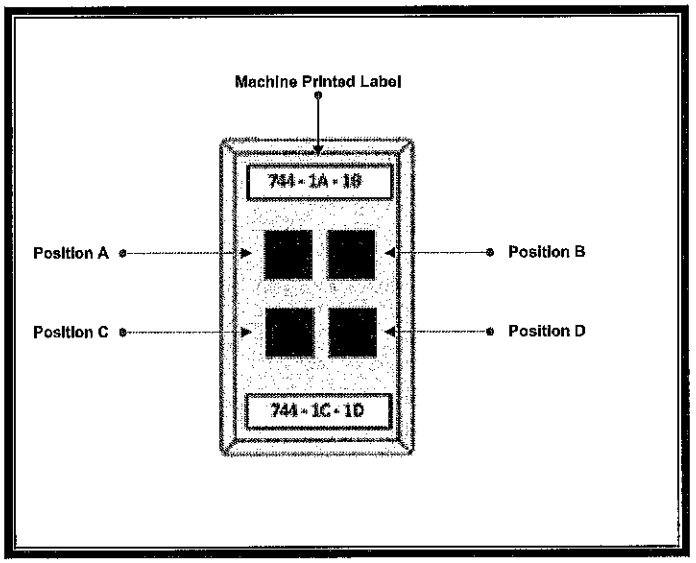


Figure 9: Faceplate Jack Positions

Faceplates for Special Systems shall be labeled with the room number, system code and jack number. Refer to Table 4 for defined system codes

Name of System	Abbreviation
Access Points	AP
Digital Signs	DS
Environmental Monitoring Systems	ENV
Access Controls	AC
Security Systems (Cameras, NVRs, etc.)	SEC

Table 4: System Codes

Section 12.09 Cable Bindings

Cable bindings (straps, tie wraps, etc) should be irregularly spaced and should be loosely fitted (easily moveable).

Section 12.10 Terminations

UTP cable runs should be terminated using modular connectors on both ends.

Eight position jack pin/pair assignments will comply with T568B termination standards.

Section 12.11 Testing

All testing shall be in compliance with TIA/EIA-568.

UTP cables shall be tested at the appropriate frequency for the cable type and tests shall provide at a minimum, wire mapping, cable length, insertion loss, return loss, propagation delay, NEXT, power sum NEXT, ACR-F, power sum ARC-F, ARC-N, and power sum ARC-N.

UTP cable test result shall "PASS". Any "MARGINAL PASS" test result shall not be acceptable and shall require re-termination.

Certification of last date and time of calibration to manufacturer's requirements for all test instruments shall be made available upon request.

Any test instrument utilized must be compliant and shall not allow marginal results to be hidden.

Test results shall be saved and submitted electronically to the building owner and LSUHSC Department of Information Technology upon completion of the installation. Format for electronic submission of test results shall be in a file format mutually agreed to by the contractor and LSUHSC Department of Information Technology.

Section 12.12 Documentation

Documentation shall be submitted in mutually compatible electronic format and must include:

- As-built drawings depicting the path of all backbone and vertical cabling as well as the primary path cable trays for horizontal cabling.
- As-built documentation of all floor plans for HCs including physical location of racks, trays, and penetrations.
- A logical representation of each patch panel including the corresponding labeling.
- Test results for every fiber optic and UTP cable installed. The test results shall be submitted in a mutually agreeable electronic format.

Section 12.13 Standard Drop

A standard drop shall consist of two blue cables. Corresponding faceplate shall have two blue modular jacks oriented as follows:

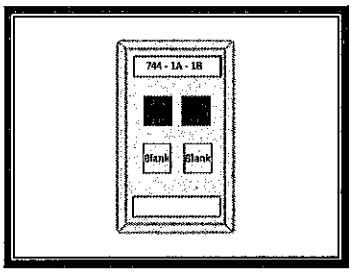


Figure 10: Standard Drop

Section 12.14 Non-Standard Drop

A non-standard drop in a typical office area may consist of one or as many as four blue cables. Corresponding faceplates shall have the corresponding number of blue modular jacks oriented as follows:

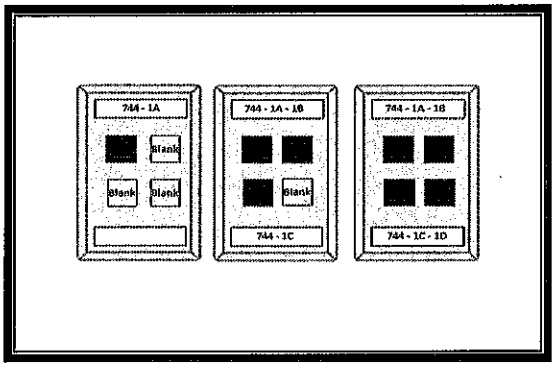


Figure 11: Non-Standard Drop Options

Section 12.15 Special Purpose Drops

The following special purpose drops have been identified:

(a) AP Drop

An AP drop shall consist of one purple cable. Corresponding keystone modules will have one purple modular jack color oriented as follows with the updated label directly applied to the module:

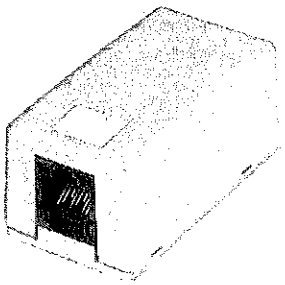
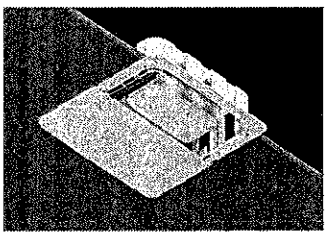


Figure 12: AP Drop

On grid/drop ceilings, AP Drop should be located above the ceiling with ceiling tile or grid marked with location of AP Drop. On non-grid/drop ceilings, AP Drop should be located inside a wireless access point enclosure which is installed and sitting recessed in the ceiling. Refer to Article XIII for preferred parts list.



(b) Digital Sign Drop

A Digital Sign drop shall consist of one blue and two yellow cables. Corresponding faceplates will have one blue and two yellow modular jacks oriented as follows:

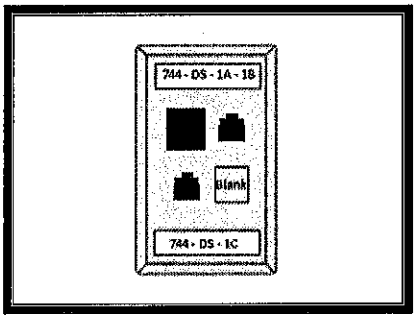


Figure 13: Digital Sign Drop

(c) AV/NVX Project Drops

Any drops labeled as AV or NVX in plans shall be run with yellow ethernet cable. Any changes to this should be discussed with the Department of Information Technology prior to any cable being installed.

(d) HVAC, Access Control, and Security Appliance Drops

All HVAC environment monitoring, access control, and security drops shall consist of a minimum of one orange cable. Corresponding faceplates will have one orange modular jack oriented as follows:

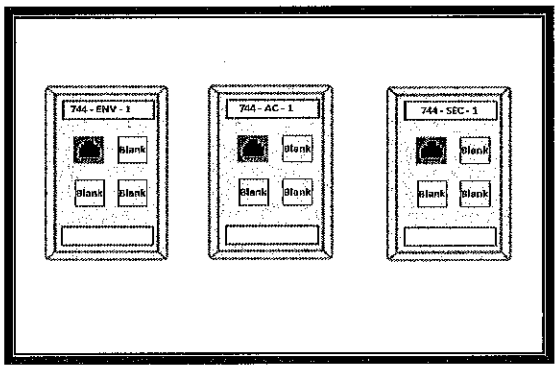


Figure 16: HVAC, Access Control and Security Appliance Drops

Keystone modules or FlexPlugs may be used in place of faceplates where appropriate and where approved by the Department of Information Technology.

Article XIII. Preferred Parts List

Brand Name Disclaimer: The cable plant constitutes the lowest layer of the OSI network model - the physical layer. As such, it is the foundation of the network, used to transport all data, voice, video, access control and environmental monitoring systems to their destinations.

As more and more systems traverse this physical layer, reliability becomes key. And to ensure this reliability, we need to ensure compatibility between products which comprise this system so that we can avoid any interoperability issues.

Within this document, many components are specified by Manufacturer, Part Number and/or Brand Name. These are the parts that have been adopted by LSUHSC not only due to interoperability but also because they exceed all ANSI TIA/EIA specifications. The LSUHSC "in-house" wiring group has been trained to install and support these products.

To deviate from using these parts would require significant investment for additional training, tools and a separate spares inventory to support the new products. It is highly recommended that all installations utilize these specific brands to maintain compatibility and interoperability with the existing installed systems.

To help maintain reliability at the physical layer, all deviations from the LSUHSC preferred brands should conform to the minimum product specifications outlined within this document.

Section 13.01 Cable Management

Part Number	Manufacturer	Item Description
30163-703	Chatsworth	CCS, Double-Sided for 3"D Racks, 7 x 10 x 12.24 (2.1 x 250 x 310)
30530-719	Chatsworth	UHCM, Double-Sided, 2U x 19 x 11.73 (297)

Section 13.02 Cable Runway

Part Number	Manufacturer	Item Description
10250-718	Chatsworth	18" Universal Cable Runway
10487-701	Chatsworth	Butt-Swivel Splice Kit
10488-701	Chatsworth	Junction Swivel Splice Kit
10489-701	Chatsworth	Vertical Swivel Splice Kit
10506-706	Chatsworth	Elevation Kit
10595-718	Chatsworth	Rack-to-Runway Mounting Kit
10642-001	Chatsworth	Protective End Caps For Runway
11301-701	Chatsworth	Butt-Splice Kit
11302-701	Chatsworth	Junction-Splice Kit
11303-000	Chatsworth	J-Bolt Kit
11310-001	Chatsworth	Threaded Ceiling Kit
11421-718	Chatsworth	Wall Angle Support Kit
11746-718	Chatsworth	Triangular Support Bracket, Steel
11959-715	Chatsworth	Cable Runway Corner Bracket
12100-718	Chatsworth	Cable Runway Radius Drop

Section 13.03 Cable Wraps

Part Number	Manufacturer	Item Description
AX100783	Belden	Velcro Cable Ties, 25 per Roll, 8"
AX100784	Belden	Velcro Cable Ties, 25 per Roll, 12"

Section 13.04 Cable Tray and Support

Part Number	Manufacturer	Item Description
Caddy CAT32	Erico	J-Hook
CF 105/300EZ	Cablofil	Cable Tray
PRECLICK	Cablofil	Preclick Splice
SWK	Cablofil	Splice Washer Kit
FASPCH 450	Cablofil	Support - Hanging

Section 13.05 Faceplates

Part Number	Manufacturer	Item Description
AX106629	Belden	Faceplates – 2 port, Angled, Single-gang Gray
AX106630	Belden	Faceplates – 2 port, Angled, Single-gang Almond
AX104483	Belden	Faceplates – 2-port, Angled inserts, Gray
AX102412	Belden	Faceplates – 2-port, Angled inserts, Almond
AX107026	Belden	Faceplate Blank Module, Gray
AX102261	Belden	Faceplate Blank Module, Almond
AX104133	Belden	KeyConnect Side Entry Box with Shutter Door 2-Port
RVAFFPUBK18-S1	Belden	REVConnect FlexPlug 10GX, 18in, UTP, Black
4108W-0SP	Leviton	QuickPort Telephone Wall Jack, stainless steel

Section 13.06 Fiber Optics

Part Number	Manufacturer	Item Description
024E81-33131-A1	Corning	Indoor Fiber Optics (Riser) – Single-mode
024E88-33131-A3	Corning	Indoor Fiber Optics (Plenum) – Single-mode
024E8F-31131-A1	Corning	Indoor/Outdoor Fiber (Riser) - Single-mode
024E8P-31131-A3	Corning	Indoor/Outdoor Fiber (Plenum) - Single-mode
024T81-33190-A1	Corning	Indoor Fiber Optics (Riser) – Multimode
024T88-33190-A3	Corning	Indoor Fiber Optics (Plenum) – Multimode
95-051-41-SP-X	Corning	Anaerobic Connector, SC, Multimode
95-201-41-SP	Corning	Anaerobic Connector, SC, Single-mode
CCH-01U	Corning	Closet Connector Housings - 1U
CCH-02U	Corning	Closet Connector Housings - 2U

CCH-03U	Corning	Closet Connector Housings - 3U
CCH-04U	Corning	Closet Connector Housings - 4U
CCH-CP12-59	Corning	Connector Panel, SC Single-mode
CCH-CP12-59-P03RH	Corning	Pigtailed Panel, SC Single-mode
CCH-CP12-E7	Corning	Connector Panel, SC Multimode
CCH-CP12-E7-P03SH	Corning	Pigtailed Panel, SC Multimode
CCH-UCC-KIT	Corning	Cable Clamp for Housing (Strain Relief for 3U & 4U)
CPP-UCC-KIT	Corning	Cable Clamp for Housing (Strain Relief for 1U & 2U)
HDWR-GRND-KIT	Corning	Hardware Grounding Kit for Armored Cables

Section 13.07 Grounding Busbar

Part Number	Manufacturer	Item Description
13622-012	Chatsworth	12" TGB Pattern
40153-012	Chatsworth	12" TMGB Pattern
40162-901	Chatsworth	#6 AWG Two-Hole Compression Lug
40162-957	Chatsworth	#2 AWG Two-Hole Compression Lug

Section 13.08 Labels

Part Number	Manufacturer	Item Description
PST-FO	Panduit	Self-Laminating Fiber Optic Cable Marker Tag
PST-FOBLNK	Panduit	Self-Laminating Fiber Optic Cable Marker Tag

Section 13.09 Modular Jacks

Part Number	Manufacturer	Item Description
RVAMJKUBL-S1	Belden	Category 6A Jack (Blue)
RVAMJKUIV-S1	Belden	Category 6A Jack (Ivory)
RVAMJKUPR-S1	Belden	Category 6A Jack (Violet)
RVAMJKUOR-S1	Belden	Category 6A Jack (Orange)
RVAMJKUYL-S1	Belden	Category 6A Jack (Yellow)

Section 13.10 Patch Cables

Part Number	Manufacturer	Item Description
CA21106007	Belden	Category 6A Modular Patch Cords 7" Blue
CA21109007	Belden	Category 6A Modular Patch Cords 7" White
CA21103007	Belden	Category 6A Modular Patch Cords 7" Orange
CA21107007	Belden	Category 6A Modular Patch Cords 7" Purple

CA21104007	Belden	Category 6A Modular Patch Cords 7" Yellow

Section 13.11 Patch Panels

Part Number	Manufacturer	Item Description
808004389	Ortronics	Telephony Patch Panel - 24 ports
AX104601	Belden	KeyConnect Angled Patch Panel, 48-port, 2U
AX103114	Belden	KeyConnect Modular Patch Panel, 24-port, 1U
AX103115	Belden	KeyConnect Modular Patch Panel, 48-port, 2U

Section 13.12 Standard Rack

Part Number	Manufacturer	Item Description
55053-703	Chatsworth	3" Deep Standard Rack, 7 (2.1) x 19", 45U

Section 13.13 Surface Mount Raceway

Part Number	Manufacturer	Item Description
LD10EI8-A	Panduit	8' Low Voltage 1-piece Single Channel Raceway, .38 in^2, (Electric Ivory)
LD10IG8-A	Panduit	8' Low Voltage 1-piece Single Channel Raceway, .38 in^2, (International Gray)
LD5EI8-A	Panduit	8' Low Voltage 1-piece Single Channel Raceway, 1.00 in^2, (Electric Ivory)
LD5IG8-A	Panduit	8' Low Voltage 1-piece Single Channel Raceway, 1.00 in^2, (International Gray)
DCF10EI-X	Panduit	Drop ceiling fitting for use with LD10 raceway (Electric Ivory)
DCF10IG-X	Panduit	Drop ceiling fitting for use with LD10 raceway (International Gray)
DCF5EI-X	Panduit	Drop ceiling fitting for use with LD5 raceway (Electric Ivory)
DCF5IG-X	Panduit	Drop ceiling fitting for use with LD5 raceway (International Gray)
JBX3510EI-A	Panduit	Low Voltage Surface Mount Outlet Boxes (Electric Ivory)

Section 13.14 UTP Cabling

Part Number	Manufacturer	Item Description
10GX13 D151000	Belden	CAT6A 10GX, 4pr, UTP, LS-PVC Jkt, CMP (Blue)
10GX13 0031000	Belden	CAT6A 10GX, 4pr, UTP, LS-PVC Jkt, CMP (Orange)
10GX13 0071000	Belden	CAT6A 10GX, 4pr, UTP, LS-PVC Jkt, CMP (Purple)
10GXS13 0041000	Belden	CAT6A 10GX, 4pr, UTP, LS-PVC Jkt, CMP (Yellow)
10GXW13 0071001	Belden	CAT6A 10GX, 4pr, UTP, LS-PVC Jkt, CMP (White)

Section 13.15 Wireless Access Point Enclosures

Part Number	Manufacturer	Item Description
1019-RM	Oberon	Wireless Access Point Enclosure (White)

Section 13.16 Wireless Access Point Wall Mounting Bracket

Part Number	Manufacturer	Item Description
ENBRKT	Tripp Lite	Universal Wall Bracket for Wireless access point mounting, right angle, steel, white