VANDERBILT UNIVERSITY

Information Technology

Network Infrastructure and Installation Standard

Vanderbilt University – Network Infrastructure and Design Engineering
https://it.vanderbilt.edu

Revised July 2025

General Project Terms and Conditions

1.0 The information in this document shall be used as a guideline for the design and installation of communications infrastructure as required by Vanderbilt University Information Technology (VUIT) in Vanderbilt owned and/or occupied facilities. This document does not address any other low voltage needs or requirements. It is intended for use by Architects, Engineers and Contractors to guide in the design and installation of a comprehensive network distribution system, which is to include but not limited to copper and fiber distribution both internal and external to the building.

1.1 All projects require a custom design of communications components to meet the specific architectural requirements of the facility; representatives from VUIT will work with the project design team to assist in the development of the distribution design.

1.2 The contractor must provide all notices, file all plans, acquire any licenses and permits, pay all fees and back charges, and obtain all necessary approvals from the Authorities having Jurisdiction (AHJ) so as to perform all work required, this is to include specifications, drawings, addendums, and change orders, in accordance with the legal requirements.

1.3 A representative of VUIT will be assigned at the start of the project. All communications concerning the project should be addressed to the VUIT representative. The "official" response for any issues or concerns will be from the VUIT appointed representative.

1.4 The communications contractor shall have a project superintendent available to answer any queries, for the duration of the project.

1.5 The communications contractor shall comply with all National Electric Codes, American National Standards Institute, Electronic Industry Alliance and the Telecommunications Industry Association (ANSI/EIA/TIA) standards.

1.6 The communications contractor shall be responsible for supplying all labor and tools required for a complete installation of the structured cabling meeting all terms, conditions, and the requirements of this document and local codes or ordinances.

1.7 The Contractor shall perform all work according to Federal, State, and local codes, rules, regulations, and ordinances governing the work, and as fully part of the specifications as if herein repeated or hereto attached. If the Contractor should note items in the drawings or the specifications, construction of which would be code violations, promptly call them to the attention of the owner's representative in writing. Where the requirements of other sections of the specifications are more stringent than applicable codes, rules, regulations, and ordinances, the specifications shall apply.

1.8 The communications contractor must provide brand names and part numbers of all items to complete the project. Vanderbilt University requires the communications contractor to utilize the items listed in Appendix C. Any item not listed in Appendix C, the contractor shall submit to VUIT brand names, item numbers and any pertinent data sheets for approval.

1.9 The communications contractor, upon request, shall provide a per drop cost. This will be used in the pricing of any additional drops not listed on drawings or in bid documents.

1.10 All penetrations made by the communications contractor in floors, ceilings and walls shall be fire-stopped according to the appropriate NEC code. All penetrations must maintain the fire rating of the surface being penetrated.

1.11 Any penetrations must be sized to accommodate two (2) times the number of cables being installed.

1.12 All penetrations in ceilings, walls and other parts of the building made by the contractor must be restored to their original condition or better.

1.13 If the contractor must disturb any materials that are suspected to be toxic or hazardous, the contractor shall cease work in that area until written notice to proceed is received from Vanderbilt University.

1.14 When penetrating through walls or floors, the contractor is responsible for controlling the resulting dust by shielding areas and covering furnishings to prevent contamination. The contractor is also responsible for controlling dust and debris caused by the removal and replacement of ceiling tiles.

1.15 The contractor shall remove all rubbish and equipment and shall leave the premises in a neat and clean condition at the end of each workday.

1.16 All work and material movement must occur in the least disruptive manner as possible, and at the convenience of Vanderbilt University. If access to an area necessitates the movement of furniture or other items, it is the contractor's responsibility to move or coordinate the removal and return of these items to their original location and orientation. Unless authorized by the project coordinator, all items must be returned to their original locations before ceasing work each day.

1.17 Removing and replacing ceiling tiles is the responsibility of the contractor. Replacement of damaged or soiled ceiling tiles is also the responsibility of the contractor.

1.18 Contractor shall provide a twenty (20) year warranty for workmanship and compliance as defined by Commscope/Systimax PartnerPro™ warranty as it pertains to the structured cabling system.

1.19 Contractors must wear an I.D. badge while on site. This badge must include a picture of the employee and the company name.

1.20 There may be other contractors working in the area, it is the responsibility of the contractor to coordinate with other contractors to complete their work within the allotted time frame.

1.21 The contractor, upon request, shall submit, in writing, the planned work schedule and progress reports to the VUIT representative.

1.22 The contractor may be required to attend status meetings as designated by the VUIT representative.

1.23 In the event that a BER/CER is not completed at the time of the cabling installation, then the contractor will neatly bundle, label (contractor's name and contact information) and secure all cabling so as not to interfere with the construction of the BER/CER.

1.24 All materials and equipment shall be manufactured, installed, and tested as specified in the latest editions of the following governing bodies, these include but are not limited to; ANSI, TIA, EIA, IEEE, NEC, NESC, NFPA, OSHA, BISCI, FCC

Standards and Contractor Qualifications

2.0 Vanderbilt University's structured cabling standard is the ANSI/TIA 568-C. The University has chosen the CommScope Systimax solution to the ANSI/TIA 568-C standard. The communications contractor must be certified and be in good standing as a CommScope PartnerPRO™.

2.1 Vanderbilt University's fiber cabling standard is the ANSI/TIA 568-C. The University has chosen the CommScope Systimax solution to the ANSI/TIA 568-C standard. The communications contractor must be certified and be in good standing as a CommScope PartnerPRO™.

2.2 The communications contractor shall have the following:

2.2.1 Comprehensive knowledge and understanding of the latest revision of the Building Industry Consulting Services International's (BICSI), Telecommunications Distribution Methods Manual (TDMM).

2.3.2 At least one (1) Registered Communications Distribution Designers (RCDD) on staff and must be available to resolve any field installation issues.

2.3.3 Installation crews should be familiar with the BICSI ITS Cabling Installation Program

2.3 **The communications contractor shall have at least five (5) years of experience installing and servicing structured cabling systems. The contractor shall provide, upon request, a list of projects that are similar in scope and magnitude, this list is to include references and contact information.**

2.4 **The accuracy and completeness of the services provided by the communications contractor, all analytical laboratory testing, and all sub-contractors may be subject to quality assurance audits by Vanderbilt University.**

2.5 **The communications contractor must be on the approved vendor list as determined by CommScope Enterprise Solutions and Vanderbilt University Information Technology (VUIT). See Appendix E.**

General Specifications for the ANSI/TIA Structured Cabling System

3.0 **All new construction and renovation projects will use CommScope Category 6A cabling green in color with Green Category 6A jacks.**

3.1 **In certain situations, such as open ceiling installations, Black Category 6A cable is acceptable, Green Category 6A jacks are still to be used.**

3.2 **In buildings where the existing Category 6 cabling is installed. Category 6 may be acceptable; this will need to be approved by VUNIDE.**

3.3 **All horizontal cabling from BER/CER's to outlet locations will be concealed in ceilings, walls, or surface raceway. No exposed cabling will be allowed unless authorized by the VUIT network infrastructure representative.**

3.4 **Any cables in ceilings are to be installed in existing cable trays. Any cable not installed in cable trays shall be supported by appropriate supporting hardware, every five (5) feet. The supporting hardware shall be attached to the building structure (concrete, cement blocks or steel beam), at no time are ceiling supports, electrical conduits or hangers used to support other trades equipment to be used for VUIT cabling.**

3.5 **All horizontal cable runs shall be in counts of 24, loosely wrapped using Velcro™ straps between cable supports. Plastic cable ties are not permitted.**

3.6 **No cabling is to be laid on ceiling tiles, lights etc. All cable runs must maintain a minimum distance of eighteen (18) inches from fluorescent lights, motors or other sources of EMI radiation and fire suppression systems.**

3.7 **All metal stud penetrations are to be a minimum of one (1) inch in diameter with a non-conductive grommet installed to protect the cable from damage.**

3.8 **All cabling runs are to be continuous without transition points or splices.**

3.9 **At a minimum, all outlets must have one (1) cable installed and terminated.**

3.10 **All outlet boxes shall be 4”x4” with an extender ring sized to fit the wall depth.**

3.11 **No more than two (4) cables shall be installed into a single gang faceplate, outlet box will be a double gang with mud ring reducer.**

3.12 **No more than (6) cables shall be installed in a double gang outlet box.**

3.13 **Communications cabling SHALL NOT be co-located within the same outlet box as electrical circuits and must not share the same faceplate.**

3.14 **A minimum of twelve (12) inches of cable slack shall be available at the outlet location. This slack is not to be stored within the outlet box.**

3.15 **A minimum of ten (10) feet of cable slack shall be available in the CER/BER’s. This slack will be attached to the wall directly behind the racks, with appropriate cabling management.**

3.16 **RJ-45 crimp connectors are not allowed for cabling terminations or patch cords, cables shall be terminated on a VUIT approved jack or patch panel.**

General Specifications for Fiber Cabling

4.0 **A minimum of 36 strand ENTRANCE OS-2 single-mode fiber optic cable shall be installed. This count may vary depending on building use. VUIT will determine the final strand count dependent on needs. All fiber optic cables shall be installed, terminated, and tested in accordance with the manufacturer's recommendations.**

4.1 **A minimum of 12 strand OS-2 RISER single-mode fiber optic cable shall be installed between the BER and CERs. This count may vary depending on circumstances, VUIT in conjunction with the low voltage designer will determine actual strand count. inner duct optic cable shall be installed, terminated, and tested in accordance with the manufacturer's recommendations.**

4.2 **All fiber optic cables are to be installed in orange inner-duct, labeled every ten (10) feet with Cable Identifier (see Sec. 9.7) and supported every five (5) feet per the ANSI/EIA 568C standard. At no time is a fiber optic cable to be installed exposed.**

4.3 **All fiber optic cabling shall be installed as a continuous run between points – splices are not acceptable, if a transition is necessary then approval by the VUIT representative is required.**

4.4 **All new fiber strands shall be terminated with UPC/LC connectors.**

General Specifications for Coaxial Cabling

5.0 **Coaxial cable is not required by VUIT for new projects unless requested by the customer.**

General Specifications for Unshielded Twisted Pair Cabling (Cat. 3)

6.0 **VUIT no longer provides analog phone services, no copper Cat 3 cabling or riser will be needed for new projects. Customers will need to utilize data or cellular options for these needs.**

Cabling Pathways for Interior and OSP

7.0 All conduit pathways of 2" or greater diameter shall be filled with MaxCell™ inner duct as noted in the table below. The telecommunications plan may also call for flexible plenum or riser rated inner duct in certain situations, with the approval from the VUIT representative.

Conduit Diameter	Innerduct Maximum
2"	1 - 2" 3-cell
3"	2 - 3" 3-cell
4"	3 - 3" 3-cell

7.1 Internal conduit pathways in all areas with hard ceilings shall extend from the faceplate to the cable tray or main cable pathway with no junction or pull boxes.

7.2 All conduits shall be bonded to the cable tray when present.

7.3 Conduit pathways, not running to cable trays, shall be stubbed above finished ceiling. The remaining cable path shall be supported via j-hooks or similar device to the cable tray or main cable pathway.

7.4 Conduits utilized for Cat6A horizontal cabling shall be sized as indicated in the table below:

# of Cables	Conduit O.D.
1-4	1"
4-8	1 ¼"
8-12	1 ½"

7.5 Conduits and pathways shall be provided to ensure that if a network connection is needed outside of the building, cabling can be installed. The locations should be determined during the design phase.

7.6 Conduits and pathways shall be provided to ensure that wireless access points can be attached to the outside of the building to provide coverage for the external areas surrounding the building. These locations should be determined during the design phase.

7.7 Pathways through "hard ceilings" will be continuous without junction or pull boxes unless ceiling access is provided to allow unimpeded access.

7.8 Pathways through "hard ceilings" shall be sized to provide two (2) times the capacity of the initial installation.

7.9 Outside Plant (OSP) conduit pathways shall consist of the appropriately sized UL listed, NEMA TC6 schedule 40 or 80 rigid PVC and encased in concrete. The duct bank shall be installed with a minimum of 24" depth of cover. (2-4) 4" Conduits will need to be installed within duct banks, consult with VUIT for any proposed changes.

7.10 All OSP fittings shall be UL listed, NEMA TC9 and matched to the conduit material. LB style connectors are not acceptable.

7.11 All OSP sweeps shall be factory manufactured and have a minimum 15-foot radius.

7.12 All OSP end caps shall be factory manufactured and watertight. (Tape is not acceptable).

7.13 All OSP duct bank spacers must be used when appropriate and shall be high density, interlocking spacers.

7.14 Six-inch-wide metallic warning tape, orange in color, shall be placed 12" above all underground conduit paths and marked every 24" with cable type identifier.

7.15 All conduits shall include a polypropylene pull rope with a minimum tensile strength of 200 pounds.

7.16 OSP Manhole/Handhole locations need to have appropriate labels above conduit(s) noting start/end of conduit(s).

7.17 New duct bank installations shall connect to existing manhole/handhole locations when close in proximity to existing OSP infrastructure, this will allow for redundancy and flexibility across campus. Consult with VUIT on design.

(BER/CER) Equipment Rooms

SPACE REQUIREMENTS

8.1.1 Building Entrance Rooms (BER) and Communications Equipment Rooms (CER) shall be appropriately sized and rectangular in shape.

8.1.2 Variances to BER and CER size are acceptable but must be approved by the VUIT representative.

8.1.3 The size of CERs is contingent on the number of network drops installed. VUIT has determined that for every 312 network drops, one (1) network rack must be installed. See Appendixes A and B for typical BER/CER and rack layout.

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8.1.5 VUIT requires a minimum of two (2) racks in BERs and CERs. These racks shall be designated as VUIT use only.

8.1.6 There shall be one more rack installed than is needed. Ex: If two racks are needed, then a third rack shall be installed. Unless only one rack is utilized, in that case, the minimum of two is acceptable.

8.1.7 There shall be a minimum of 3 Ft on three sides of the rack. See Appendix B for typical BER/CER layout. If equipment is to be mounted on the walls, then the three feet of clearance shall be measured off the furthest point of the equipment that extends into the room.

8.1.8 These space requirements only address VUIT's network service's needs, any additional services to be installed in the BER/CERs must provide the space requirements needed which may impact the size of the room.

8.1.9 In multi-floor buildings, rooms shall be vertically stacked so to provide a straight vertical riser.

8.1.10 Depending on the usage of the building it may be possible to place CER/BER rooms on alternating floors, however cable distances must be within EIA/TIA specifications. This design must be approved by the VUIT representative.

ELECTRICAL REQUIREMENTS

8.2.1 Each rack shall have one (1) quad NEMA 5-20R, (1) NEMA L6-30R and three (3) NEMA L5-30R receptacles attached to the rear of the rack (as shown in Appendix A). These outlets are to be mounted approximately 18" AFF labeled with circuit and panel number. Wall mounting of circuits is acceptable in certain installations, consult with VUIT for approval.

8.2.2 These outlets must be on individual dedicated circuits and on emergency/generator power when possible.

8.2.3 All electrical outlets mounted on the racks shall be EMT conduit run from above rack, at no time is a flexible portable power cord (SO) to be used.

8.2.4 The electrical outlets shall not impede the rack mounting screw locations.

8.2.5 Convenience outlets shall be NEMA 5-20R installed on BER/CER walls per applicable codes.

8.2.6 Router Room BER will require four (4) NEMA L6-30R, (2) NEMA L5-30R and one quad NEMA 5-20R receptacles per rack attached to the rear of the racks (as shown in Appendix A). These outlets are to be mounted approximately 18" AFF. The need for these outlets should be determined during the design phase of the project.

8.2.7 Electrical sub-panel shall be installed near the entry with EPO for all dedicated circuits within BER/CER data closet.

ENVIROMENTAL REQUIREMENTS

8.3.1 All BERs and CERs shall include an HVAC system capable of maintaining a temperature within the range of 64 to 75 degrees Fahrenheit at 30 to 55 percent relative humidity.

8.3.2 System control shall be within and dedicated to the individual BER/CER.

8.3.3 Rooms must always be kept clean and dust free.

8.3.4 The amount of potential equipment will determine the BTU dissipation for each BER/CER. (1) VUIT equipment rack fully loaded with 312 cables, would require 5 switches and 3 UPS. The BTU for that would be 38974 per hour.

8.3.5 If a split unit HVAC unit is necessary within an equipment room, then a water catch drip pan is to be installed, drained to the plumbing drainage location.

8.3.6 CER/BER room's HVAC unit shall be independent of the building HVAC with thermostat in room.

MISCELLANIOUS REQUIREMENTS

8.4.1 Rooms shall be located centrally within the facility when possible, while maintaining a 300 feet maximum horizontal cable length between faceplate and patch panel.

8.4.2 All communications rooms must be accessible 24 hours a day, 365 days a year.

8.4.3 All communications rooms must have corridor access. At no time should access be through another room or used as a pass through to another room.

8.4.4 BERs shall be located within proximity to where inter-building communications cables enter the facility.

8.4.5 Floors shall be sealed or epoxied and have anti-static properties. Carpet is NOT permitted. Flooring base shall be installed where applicable.

8.4.6 All walls shall be covered with ¾" Fire Retardant-treated wood (FRTW) mounted 6" AFF and be painted White. All applicable inspection quality stamps must remain unpainted.

8.4.7 The ceiling height in BERs and CERs shall not be less than 8ft. 6in. AFF. False ceilings are NOT permitted.

8.4.8 Some BER's may house Core/Distribution network components. These components are larger in size than typical network equipment. These rooms will require double doors. Core/Distribution rooms will need to be identified with the VUIT representative during programming.

8.4.9 Core/Distribution rooms shall have double doors each measuring 80"H x 36" W and constructed without a doorsill or center post, these doors need to swing out and lay flat with door sweeps.

8.4.10 BER/CERs shall have a single door measuring 80"H x 36" W, this door needs to swing out and lay flat with door sweep.

8.4.11 Sufficient LED lighting shall be provided to ensure a minimum of 50-foot candles, measured 3' above the finished floor after all racks, cable trays and cables are in place.

8.4.12 Rooms shall be secured via the electronic building access control system. If no system is present, then all doors shall have the capability of adding card readers and electronic door strikes and be identically keyed utilizing Vanderbilts IT core. Code locks may be utilized in multi-access situations where card access is not an option.

8.4.13 BER and CERs shall have a clean agent fire extinguisher located within the space below the light switch – See NFPA 75 for guidance.

8.4.14 Water, chemical or any type of drain piping not associated with network equipment shall NOT be present or installed directly above the BER/CERs.

8.4.15 BERs or CERs that contain HVAC units, water or drain piping must be equipped with a leak detection system and drip pan with drain line.

8.4.16 Condensate or steam piping shall NOT be present in the BERs or CERs.

8.4.17 The BER shall have a minimum of (2) 4" conduits stubbed to the outside of the building; (2) additional 4" conduits will be needed for a diverse redundant route exiting the building to nearest MH/HH or utility pole; these conduits must be sealed to prevent water, dirt, and any foreign objects from entering the building.

8.4.18 All racks are to be bolted to the floor per manufacturer's specifications.

8.4.19 Each door shall have a dust sweep installed to mitigate any dust or debris intrusion.

Labeling Requirements

9.0 Installer shall label all installed cabling.

9.1 Labeling shall not take place until all faceplates, patch panels, wiring blocks and termination hardware are secure in their final location and testing has been completed.

9.2 All labels shall be machine printed; handwritten labels are not acceptable.

9.3 Outlets within rooms shall be sequentially labeled, left to right where applicable.

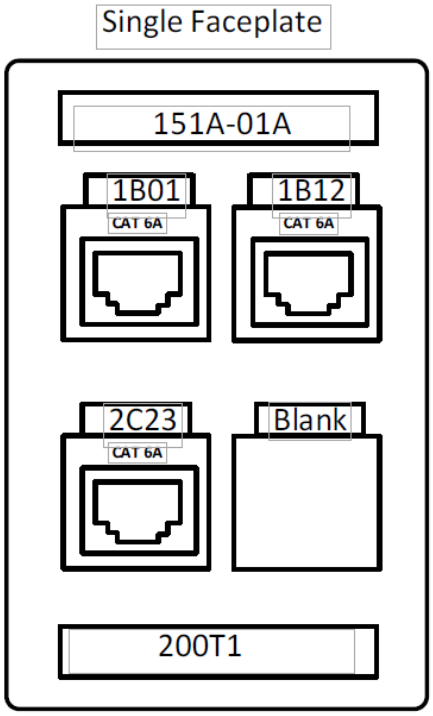
9.4 New faceplate labeling Scheme (effective from May 2025) All new installations shall follow the scheme described below.

A. CER/BER label Example: 151A-01A

- **151A-VU Building code**
- **01- numeric character(s) identifying the floor of the building occupied by the CER/BER.**
- **A - alpha character uniquely identifying the CER/BER on the floor, this will be assigned by VUIT.**

B. Data port label Example: 1B01

- **1- Rack Identifier**
- **B - Patch panel Identifier**
- **200T1- Actual CER/BER Name assigned by VU**

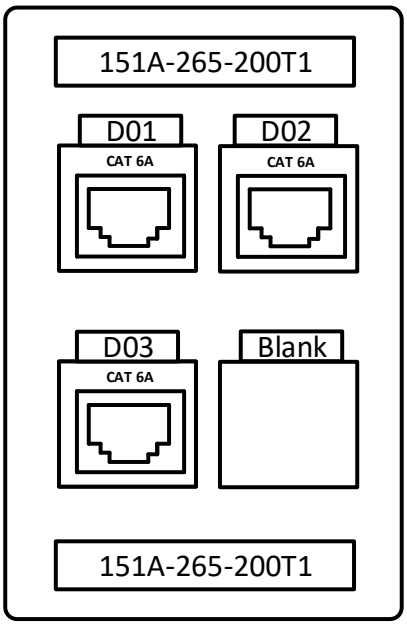


9.4.2 Old existing system as of May 2025, which will remain in the campus installations until the area they are in is renovated or demolished for new construction. This is for reference only, to be used as a guide during maintenance or operational work.

The old faceplate labeling scheme is described below:

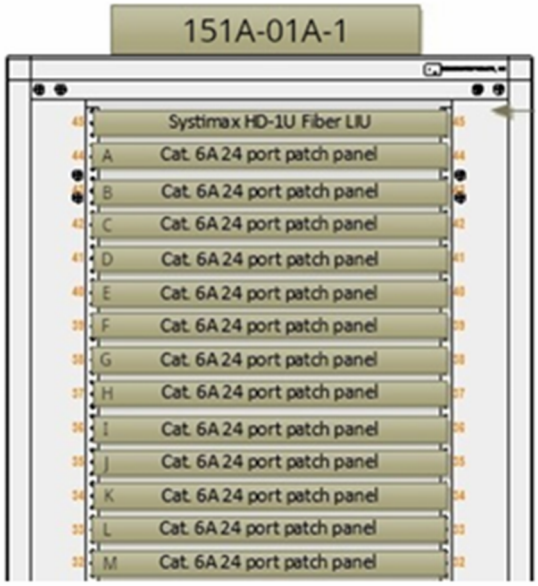
- **151A-265-200T1**
  - **151A represents the building code.**
  - **265 represents the room number the jack is in**
  - **D:200T1 represents the terminating BER/CER**
    - **D01 represents the jack number in the room.**
    - **D02 represents the jack number in the room.**
    - **D03 represents the jack number in the room.**

Single Faceplate



9.4.3 Data rack labeling

- **Rack labels will be applied to the top center of each data rack.**
- **If more than one data rack is in the room, racks will be labeled from the interior wall outwards. Contact VUIT for more information on designated labels.**
  - **151A-01A-1**
    - **151A represents the VU building code.**
    - **01A represents the VUIT room number.**
    - **1 represents the rack number.**



9.4.4 Modular Patch panel labeling (New labeling)

- **Patch panel identification labels will start with A, B, C, D, etc. labeled on the top left-hand side of the patch panel.**
- **1A1 example**
  - **1 represents the data rack.**
  - **A represents the patch panel (1-24)**
  - **1 represents the data jack number in that patch panel.**
- **2B24 example**
  - **2 represents the data rack.**
  - **B represents the patch panel (1-24)**
  - **24 represents the data jack number in that patch panel.**

9.5 Fiber LIU labeling

- **MF and/or RF labels are to be on the top left-hand side of the LIU door in descending order. (see example)**
- **Fiber LIU labels are to be on the right-hand top side of the LIU door, these will be labeled FPL1, FPL2, FPL3, etc. (see example)**

9.5.1 Fiber Riser (RF) Cabling

- **All cables shall be clearly marked with a unique identifier at both ends of the fiber sheath.**
- **Individual strands shall be labelled from left to right and follow manufacturers specifications.**
- **Sample Riser Fiber LIU labeling scheme:**
  - **RF-151A-1A-2C 12SM**
    101-207
    - **RF-151A represents Riser Fiber and Building code.**
    - **1A represents the originating BER VUIT room label.**
    - **2C represents the terminating CER room label.**
    - **12 SM represents single-mode strand count.**
    - **101 to 207 represents the VU room numbers.**
  - **Riser fiber LIU labeling on inside door**
    - **Example- 1-12 1A (101)-2C (207)**
    - **1-12 represents strand numbers in module.**
    - **1A (101) represents originating BER VUIT and VU room label.**
    - **2C (207) represents the terminating CER and VU room label.**

9.5.2 Main Fiber (MF) Entrance Cables

- **All cables shall be clearly marked with a unique identifier at both ends of the cable, this will be assigned by VUIT.**
- **Individual strands shall be labelled left to right according to the manufacturer's specification.**
- **Building name to Building name shall be included (ex: Hill to SC5)**
- **Sample Main Fiber LIU labeling scheme:**
  - **MF-0256 151A-SC5 36 SM**
    - **MF-0256 is a unique cable identifier. (provided by VUIT)**
    - **151A represents terminating building.**
    - **SC5 represents terminating building.**
    - **36 SM represents single-mode strand count.**
    - **If multiple fiber sheaths are in a common Fiber LIU, continue labeling under original labels, etc.**

9.5.3 Fiber panel labeling within LIU door

- **First fiber sheath shall be labeled left to right starting at the bottom.**
- **Each 12-strand module shall be labelled with MF-0XXX, end point of fibers building name and building code, followed by strand count.**
- **Next fiber sheath to be added after the first sheath ends left to right.**

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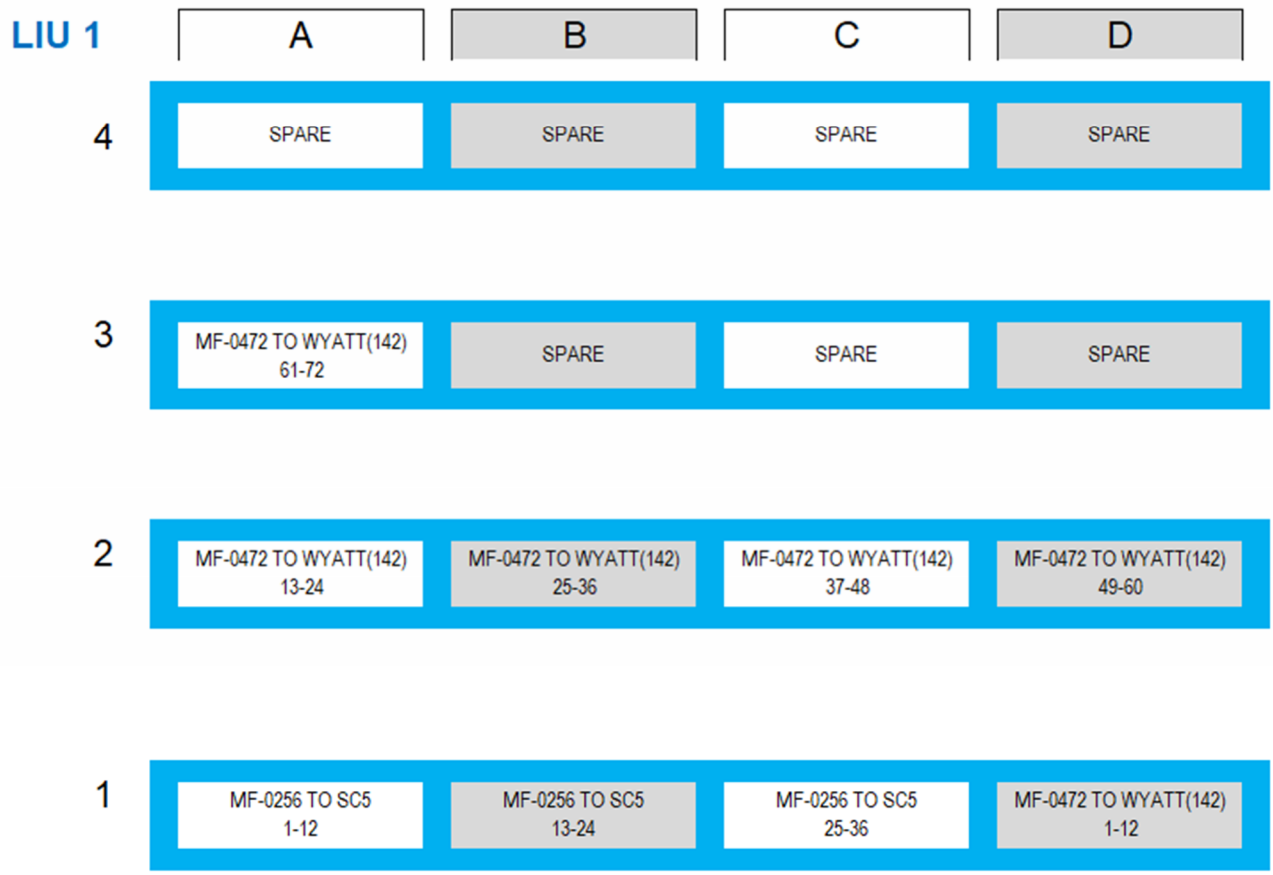


Grounding and Bonding

10.0 The telecommunications grounding system shall meet ANSI/TIA-607 standard, the National Electric Code, and all related grounding codes and standards.

10.1 All BERs shall contain the Telecommunications Main Grounding Busbar (TMGB).

10.2 The TMGB shall have the minimum dimensions of 6mm thick by 100mm wide and be of sufficient length to support the number of connections required.

10.3 A ¾" EMT conduit shall be provided from the main building grounding electrode to the TMGB.

10.4 An appropriately sized grounding wire shall be installed to connect the main building grounding electrode to the TMGB.

10.5 All equipment rooms shall contain a Telecommunications Grounding Busbar (TGB).

10.6 The TGB shall have the minimum dimensions of 6mm thick by 50mm wide and be of sufficient length to support the number of connections required.

10.7 A ¾" EMT conduit shall be provided from the TMGB to all TGBs.

10.8 An appropriately sized grounding wire shall be installed to connect the TMGB to all TGBs.

10.9 All busbars shall be predrilled with standard NEMA bolt hole sizing and spacing for the type of connectors to be used.

10.10 Position all busbars low on the telecommunications backboard so that they will not interfere with future riser or station cable.

10.11 Route all ground wires near the edges of the telecommunications backboard to leave the backboard unobstructed.

Fire Stopping

11.0 Installer shall seal all communications penetrations in accordance with the National Fire Protection Association (NFPA), the National Electric Code (NEC) and EIA/TIA 569 standards.

11.1 Abesco CT120 Cable Transits are the preferred method for cable sleeve penetrations through fire rated barriers.

11.2 Fire rated pillows/putty shall be used to seal all cable tray and conduit penetrations through fire rated barriers.

11.3 Use of acoustic putty, concrete or any other non-pliable fire/smoke barriers is prohibited.

Emergency Bluelight & Elevator Phones

12.0 All emergency phones shall be installed under the direction of VUPS. TS&L (Transportation Solutions & Lighting) is the contractor of choice for the cellular E-Phone towers for VUPS. https://www.tsandl.us

12.1 Elevator phones shall be installed under the direction of VU Maintenance & Operations.

Wireless Access Point Specifications

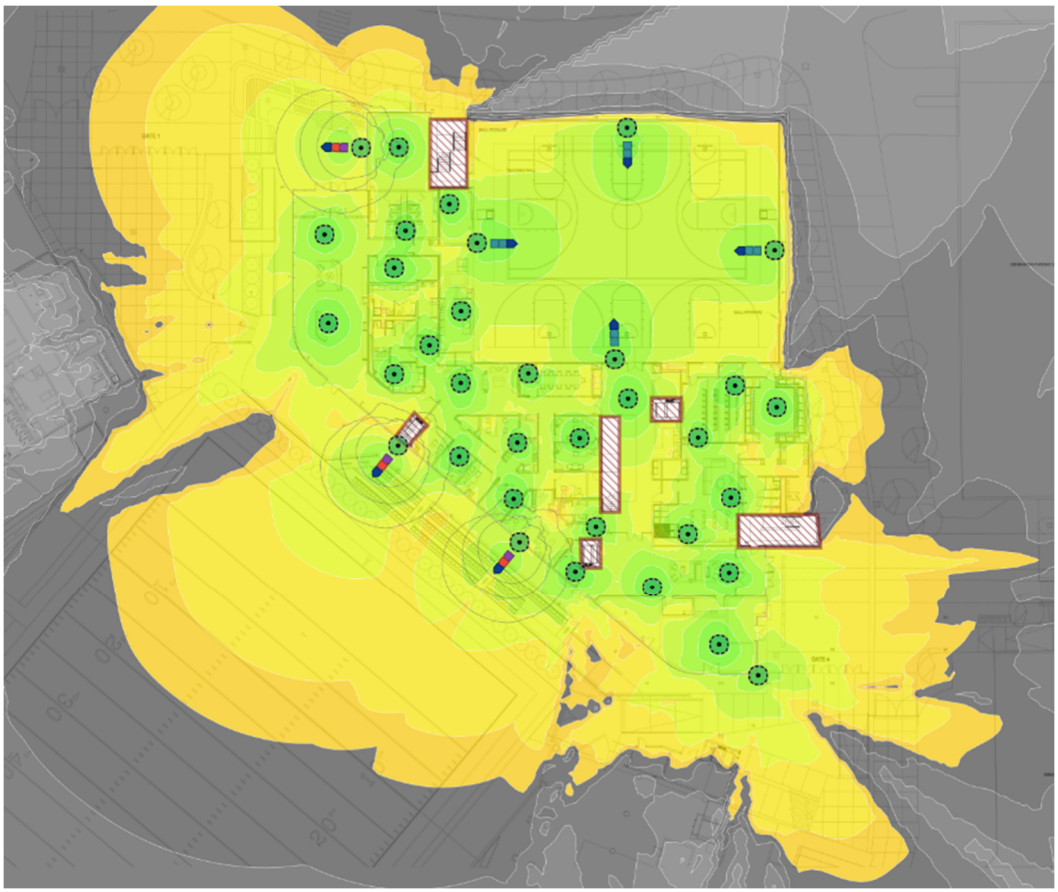
13.0 Wireless design will be provided by VUIT, DWG drawings will be needed from the design team.

13.1 Each wireless access point will have (1) Cat6A cable, green in color, not to exceed 300 ft.

13.2 Outdoor Wireless Access points shall be mounted to the exterior of facilities designated by the predictive design, they shall be mounted at a height that is accessible from a ladder no higher than 15 ft. above grade for maintenance.

13.3 Outdoor Wireless Access points shall be installed with appropriate lightning protection and grounding where needed.

13.4 Outdoor Wireless Access points shall not have any trees or shrubbery planned that would interfere with the coverage areas.



APPENDIX A: Racks

Typical Building Equipment Room Rack Layout

Front

Rear

Fiber LIU
Systimax Part #:
HD-4U

Cat. 6A 24 port patch panel
Cat. 6A 24 port patch panel
Cat. 6A 24 port patch panel
Cat. 6A 24 port patch panel
Cat. 6A 24 port patch panel
Cat. 6A 24 port patch panel
Cat. 6A 24 port patch panel
Cat. 6A 24 port patch panel
Cat. 6A 24 port patch panel
Cat. 6A 24 port patch panel
Cat. 6A 24 port patch panel
12S distribution switch
12S distribution switch

Contractor Provided
Maximum 312 cables per rack

Cable Management
Lifecycle

Cable Management
Lifecycle

Cable Management
Lifecycle

Cable Management
Lifecycle

Cable Management
Lifecycle

PDU

VUIT Provided
240 Network Ports

(3)L5-30,(1)L6-30R
Receptacles
Contractor Provided
On Building Generator
if Available

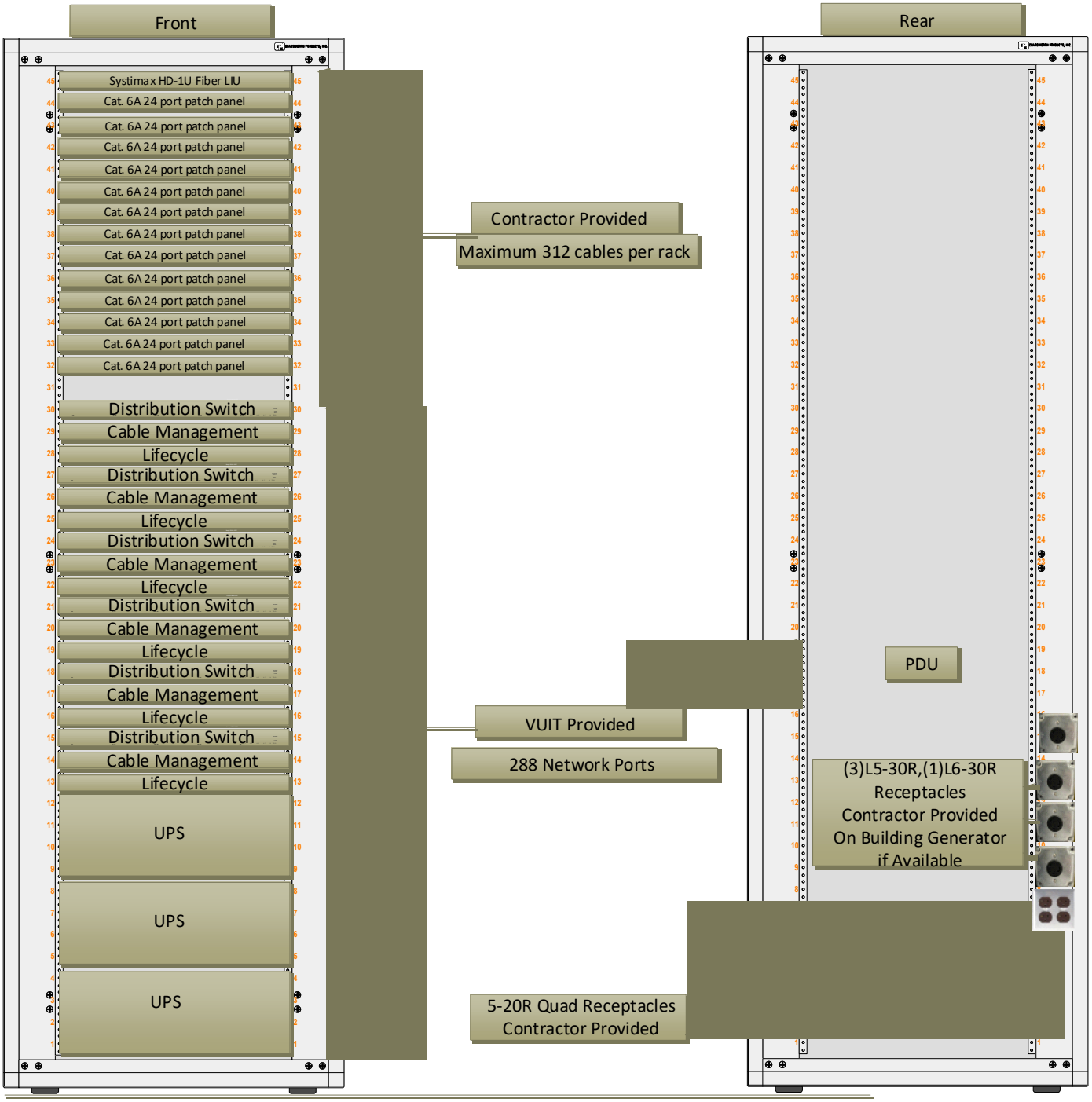
UPS

UPS

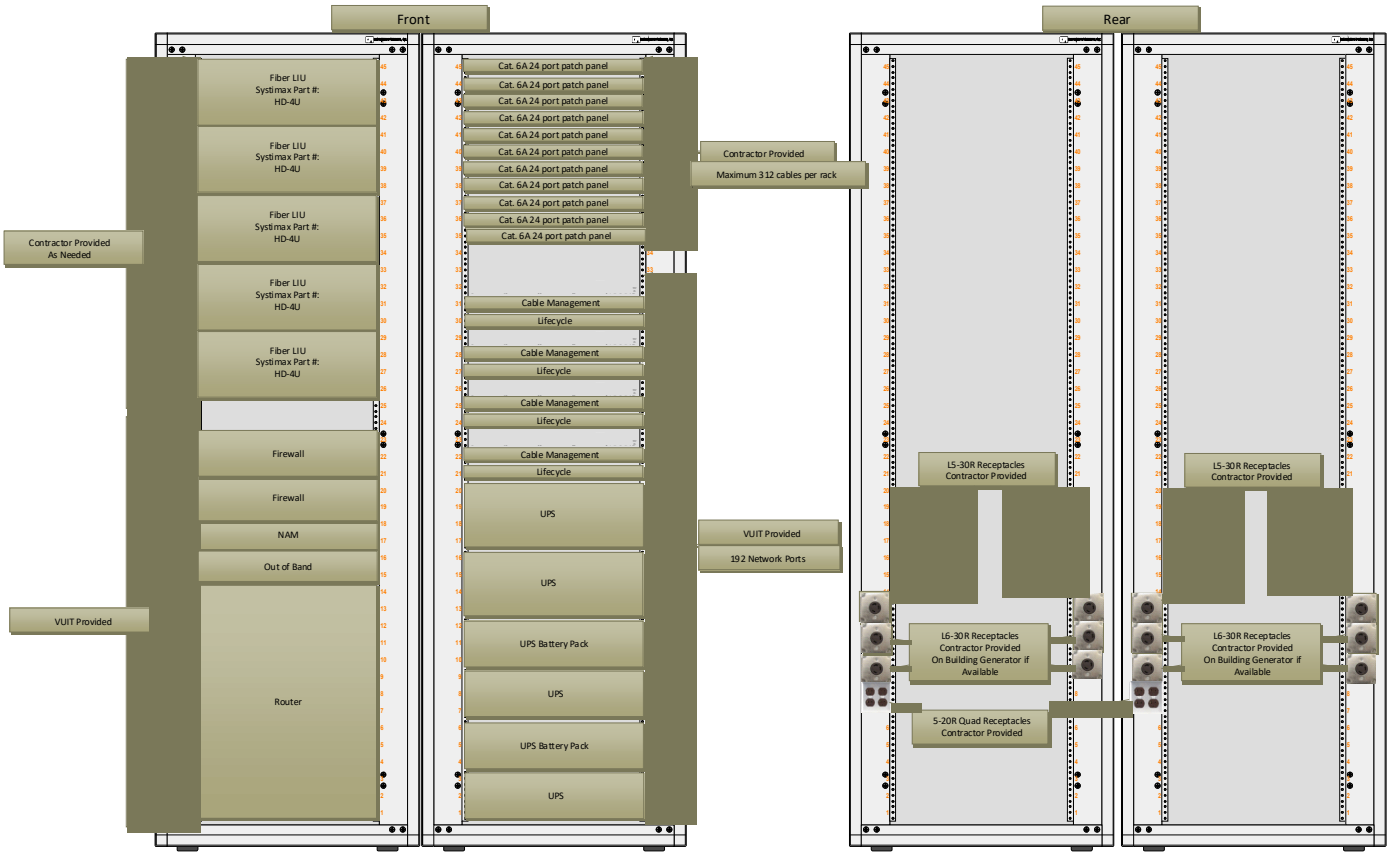
UPS

5-20R Quad Receptacle
Contractor Provided

Typical Communication Equipment Room Rack Layout

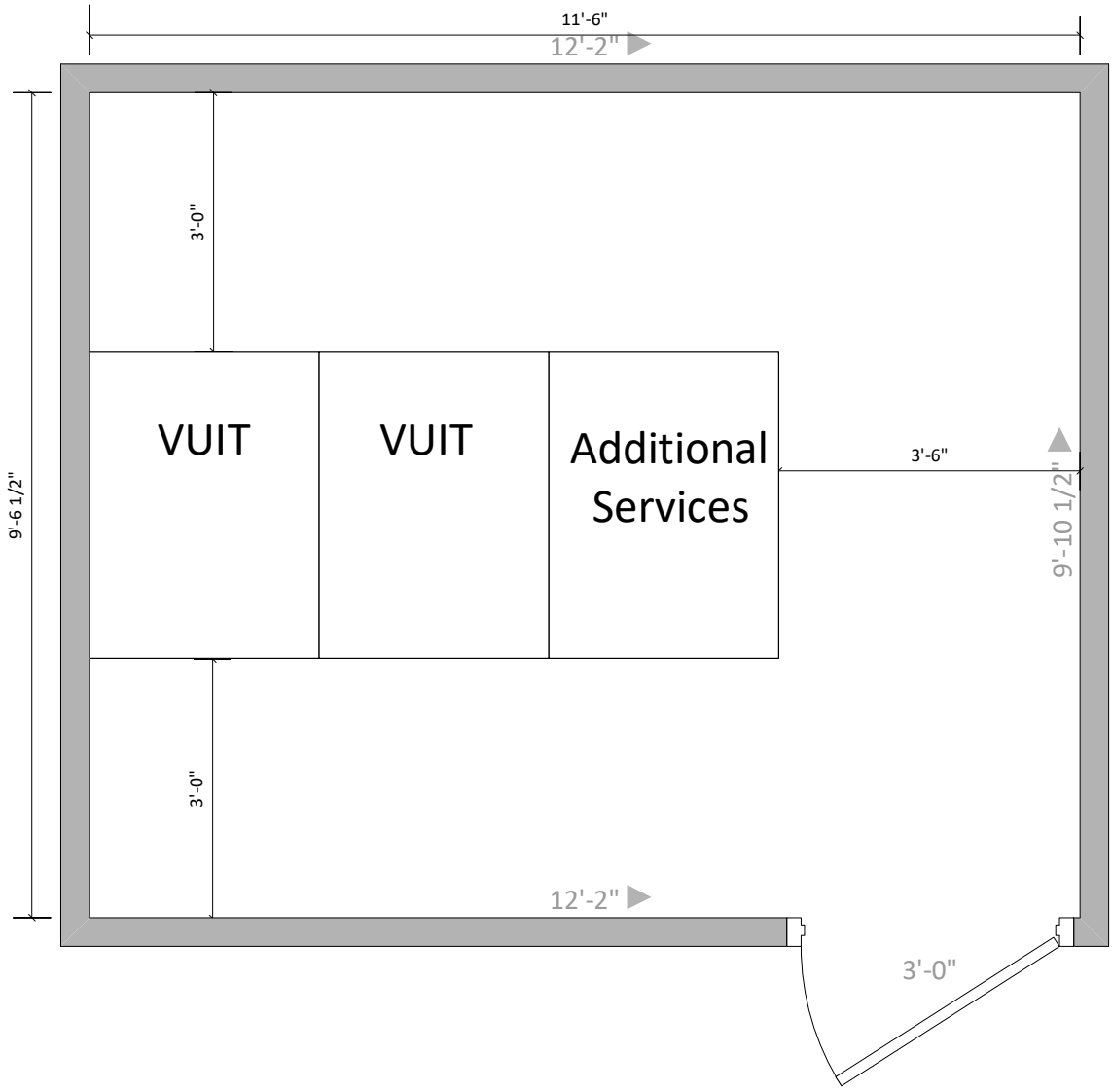


Typical Core Distribution Room Rack Layout

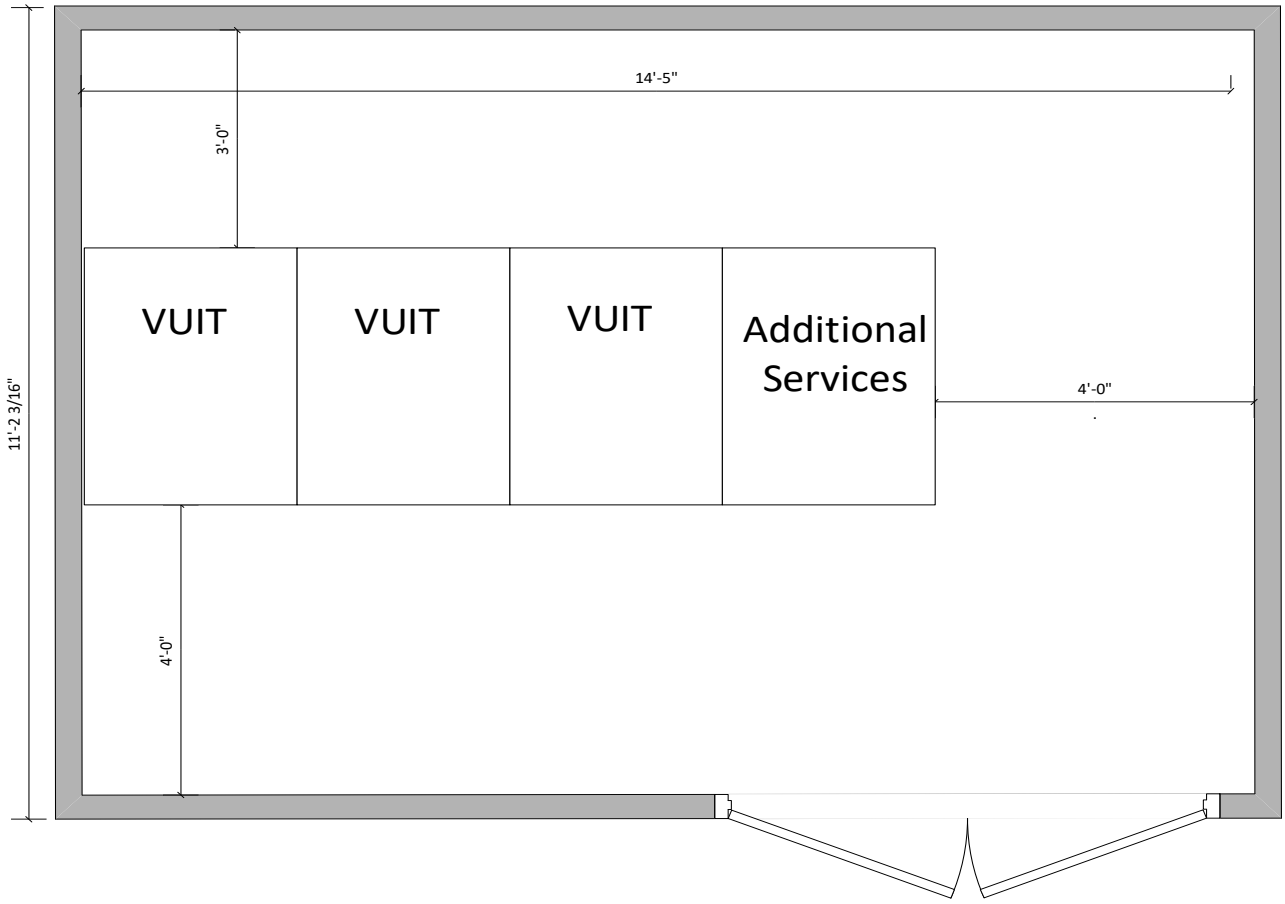


APPENDIX B: Room Layout

Typical BER/CER Layout



Typical Core Distribution Room Layout



APPENDIX C: Material List

Horizontal Cabling

DESCRIPTION	PART NUMBER
SYSTIMAX (1071) NON-PLENUM, CAT 6, 4-pair Yellow	1071E YL
SYSTIMAX (1091) NON-PLENUM, CAT 6A, Green	1091B GR
SYSTIMAX (2071) PLENUM, CAT 6, 4-pair Yellow	2071E YL
SYSTIMAX (2091) NON-PLENUM, CAT 6A, Green	2091B GR
SYSTIMAX (MGS400BH1-123) Gigaspeed CAT 6 Insert	MGS400BH1-123
SYSTIMAX (MGS600-226) CAT 6A Insert - green	MGS600-226
SYSTIMAX (360-MOD-1U-24) 360 UTP Modular 24 port panel CAT 6A	360-E-MOD-1U-24
SYSTIMAX CAT 6A Patch Panels (360-PM-GS6-2U-24) 24 Port CAT 6A	360-PM-GS6-2U
SYSTIMAX CAT 6A Patch Panels (360-PM-GS6-2U-48) 48 Port CAT 6A	360-PM-GS6-2U-48P
SYSTIMAX (M101SMB-B-246) single port surface box ivory	M101SMB-B-246
SYSTIMAX (M102SMB-B-246) dual port surface box ivory	M102SMB-B-246
SYSTIMAX (M104SMB-B-246) quad port surface box ivory	M104SMB-B-246
SYSTIMAX (M10L-246) ivory Single faceplates	M10L-246
SYSTIMAX (M12L-246) ivory Dual faceplates	M12L-246
SYSTIMAX (M14L-246) ivory Quad faceplates	M14L-246
SYSTIMAX (M10L-262) white Single faceplates	M10L-262
SYSTIMAX (M14L-262) white Quad faceplates	M14L-262
SYSTIMAX (M14L-262) white Quad faceplates	M14L-262
SYSTIMAX (M14SP) Stainless Quad faceplates	M14SP
SYSTIMAX (M10LW-246) Ivory Wall Phone Plate	M10LW-246
SYSTIMAX (M10LW-STAINLESS) Stainless Wall Phone Plate	M10LW-STAINLESS
SYSTIMAX (M101SMB-B-262) single port surface box white	M101SMB-B-262
SYSTIMAX (M102SMB-B-262) dual port surface box white	M102SMB-B-262
SYSTIMAX (M104SMB-B-262) quad port surface box white	M104SMB-B-262
SYSTIMAX (M81C-B) Coax Video Insert	M81C-B
SYSTIMAX (M106FR2-246) Adapter	M106FR2-246
SYSTIMAX (360-PM-GS3-48) 48 port Patchmax patch panel	360-PM-GS3-48
SYSTIMAX (360-PM-GS3-24) 24 port Patchmax patch panel	360-PM-GS3-24
SYSTIMAX CAT 6 Patch Panels (360-PM-GS3-2U) 24 Port CAT 6A	360-PM-GS3-2U
SYSTIMAX CAT 6 Patch Panels (360-PM-GS6-2U-48P) 48 Port CAT 6A	360-PM-GS3-2U-48P
SYSTIMAX (M20AP-246) blank modules 100pk	M20AP-246
SYSTIMAX (M20AP-262) blank modules 100pk	M20AP-262

CER/BER Build-Out

DESCRIPTION	PART NUMBER
CPI Zeta Frame Open Frame Cabinet 45U x 800W x 1000D	ZF,6SL, BK800WX1000DX45HTP,NO/NO
CPI Mega frame Vertical Manager 12465-707	12465-707
CPI Rack Busbar 10610-019	10610-019
CPI Cube-It wall mount network enclosure 24” x 30”	12419-X24
CPI Cube-It wall mount network enclosure 36” x 30”	12419-X36
CPI Cube-It wall mount network enclosure 48” x 30”	12419-X48
CPI Cube-It dual fan kit for network enclosure	40975-001
APC 6U slim wall mount network enclosure	AR106V
CPI 6" Vertical Wire Manager 30162-703	30162-703
CPI 4" Vertical Wire Manager 30161-703	30161-703
Middle Atlantic (MK-19-45) Equipment Rack	MK-19-45
Panduit 2-hole ground connectors - LCCX6-14A-L	LCCX6-14A-L
Panduit Ground Bar - GB2B0306TP-1	GB2B0306TP-1
6" Metal D-rings	Generic
Panduit (HLS-15RO) Velcro 3/4" x 15' Roll	HLS-15RO
Junction Splice Tee Kits 11302-701	11302-701
CPI Butt Splice Kit Kits 11301-701	11301-701
CPI Ladder Racking 12" - 10250-712	10250-712
CPI Ceiling Support - 11310-003	11310-003
CPI 12" wall Bracket 12" - 11421-712	11412-712
CPI Radius Drops - 12100-710	12100-710
CPI 24" Ladder Racking- 14300-X24	14300-X24
CPI 18" Ladder Racking- 14300-X18	14300-X18
CPI 12" Ladder Racking- 14300-X12	14300-X12
CPI 18" Triangle Brackets - 11746-718	11746-718
CPI 24" Wall Brackets - 11421-718	11421-708
CPI 18" Wall Brackets - 11421-724	11421-724

Intra-Building Fiber and Copper

DESCRIPTION	PART NUMBER
CommScope (Z-024-DS-8W-FSUBK) 24 Strand SM Indoor/outdoor	Z-024-DS-8W-FSUBK
CommScope (D-024-LN-8W-F12NS) 24 Strand SM outdoor	D-024-LN-8W-F12NS
CommScope (R-024-DS-8W-FSUYL) 24 Strand SM indoor (innerduct needed)	R-024-DS-8W-FSUYL
CommScope (R-024-DZ-8W-FSUYL) 24 Strand SM indoor Armored	R-024-DZ-8W-FSUYL
SYSTIMAX 4U Fiber Shelf	HD-4U
SYSTIMAX 1U Fiber Shelf	HD-1U
SYSTIMAX (760245401) 12 Port SM LC Splice Cassette	G2-SP-12LCG-PT
SYSTIMAX SC SM non tunable connectors SFC-LCR-30-BL	SFC-LCR-30-BL
Maxcell between CERs 4" - 3 cell	MXC4003GR
SYSTIMAX (1100GS3-24) 24 port Patchmax patch panel	1100-U-PS-24

Appendix D: Acronyms

AhJ	**Authorities having Jurisdiction.**
ANSI/TIA	**American National Standards Institute/Telecommunications Industry Association**
APC/LC	**Angled Physical Contact/Lucent Connector**
BER/CER	**Building Equipment Room/Communications Equipment Room**
BICSI	**Building Industry Consulting Service International**
FRTW	**Fire Retardant Treated Wood**
NEC	**National Electrical Code**
NEMA	**National Electrical Manufacturers Association**
NFPA	**National Fire Protection Association**
OSP	**Outside Plant**
RCDD	**Registered Communications Distribution Designer**
TDMM	**Telecommunications Distribution Method Manual**
TGB	**Telecommunications Grounding Busbar**
TMGB	**Telecommunications Main Grounding Busbar**
UPC/LC	**Ultra Physical Contact/Lucent Connector**
UTP	**Un-shielded Twisted Pair**
VUIT	**Vanderbilt University Information Technology**

Appendix E: Approved Cabling Vendors

Beacon Technologies

1441 Donelson Pike
Nashville TN 37217
www.beacontech.net

Black Box

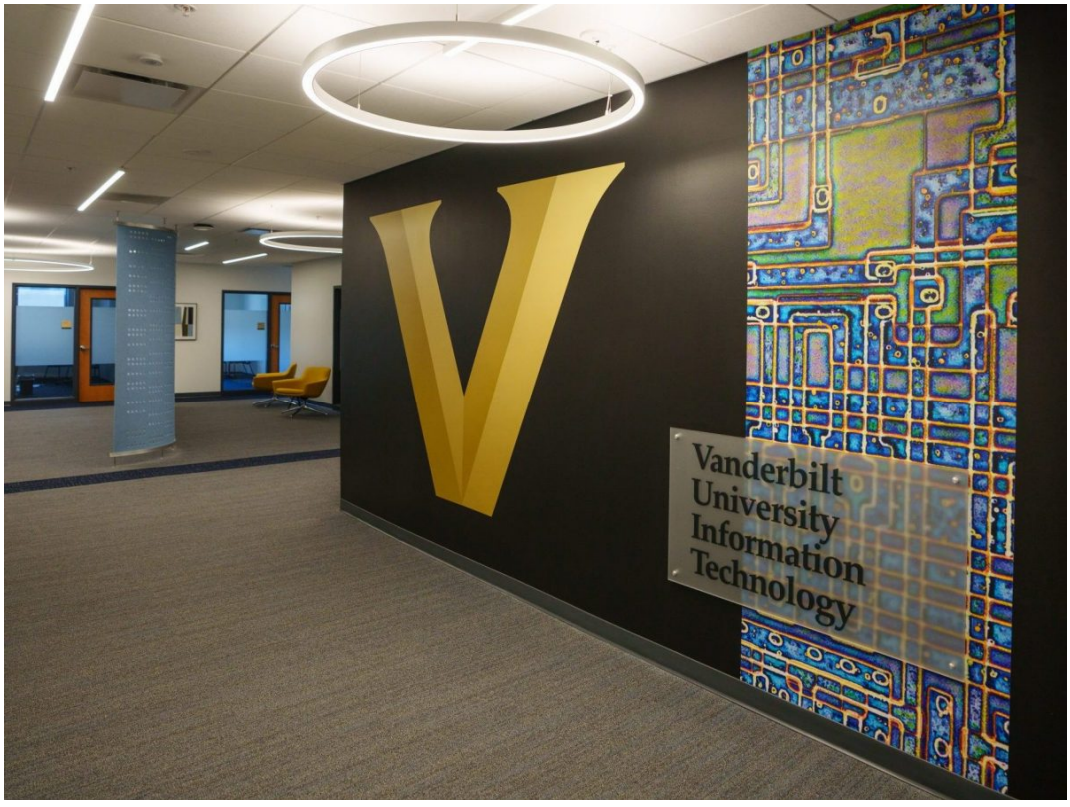
1010 Haley Rd
Murfreesboro TN 37129
www.blackbox.com

Boe-Tel TN Company

2948 Foster Creighton Dr
Nashville TN 37204
www.boetel-tn.com

Digital Group

913 Myatt Industrial Dr
Madison TN 37115
www.digitalgroupllc.com



Appendix F: General Contractor Expectations

Date: 7/31/2025
From: VU Information Technology
To: VU Campus Planning & Construction Contractors
Contact: Chad DeMarcus, VUIT Network Infrastructure chad.demarcus@vanderbilt.edu

The purpose of this document is to clarify the expectations of VUIT regarding the network data equipment rooms. To ensure a sound network infrastructure and institutional excellence, VUIT expects the equipment rooms to be Clean, Conditioned, Secure, and Complete. These requirements must be met before any network equipment can be installed. Care should be taken if a network equipment room is in or near a construction area to ensure equipment is protected from construction dust and debris.

VUIT equipment rooms located within a construction area, that must maintain customer support, procedures must be taken to maintain equipment room specifications outlined in VUIT's Network Infrastructure Standards. (See Sec. 8) This includes but is not limited to dust and debris mitigation.

1. **Clean:** See section 8.3 of the University's wiring standard. Rooms should be free of any dust and debris; and the "final clean" must be completed before VUIT will install equipment.

2. **Conditioned:** See section 8.3 of the University's wiring standard for specification on environmental requirements
    - All controls and conditioning equipment should be installed and operating to manufacture's specification.
    - Any conditioning components passing through the equipment rooms should be completed before any networking equipment is installed.

3. **Secure:** See section 8.4.10 of the University's wiring standard for specification on securing equipment rooms.
    - Locks must be installed and keyed to Vanderbilt University key system, once secure access must be obtained through the Plant Operations key request process.

4. **Complete:**
    - All electrical outlets must be active and labeled.
    - Plywood installed and painted.
    - Doors must be installed, finished, and working properly.
    - VUIT racks must be installed and bolted to the floor.
    - Cabling must be routed to the rack location, with all supports and cable tray installed.
    - Grounding and bonding of racks and cabling trays must be complete.
    - Lighting must be installed and working.
    - Floors must be installed and sealed.
    - Fire extinguisher must be installed.
    - All fiber and copper connections must be completed, tested, and certified.

Appendix G: BER/CER Design Expectations

The purpose of this document is to provide architects and network system designers with a high-level overview of VUIT's equipment room requirements.

1. VUIT needs dedicated, separate rooms in which to place networking equipment. These rooms should have vertical and horizontal accessibility in order to access all areas of the building.

2. Each rack located in an equipment room may house 312 cables. If there are >312 network cables, then additional racks will need to be installed.

3. One (1) additional rack needs to be installed above the racks necessary, this rack is for additional services.

4. Current rack dimensions for CPI Zeta Frame W31.5"x H85"x D39.5".

5. The racks must have a minimum of 3 feet of clearance on 3 sides. See drawing; Appendix B.

6. A minimum of two (2) racks are to be installed in equipment rooms.

7. Provide each rack to have dedicated circuits (1) 5-20 quad receptacles, (1) L6-30 and two (3) L5-30 receptacles.

8. Network cabling should be within 300 feet from the equipment room to network outlet.

9. Equipment rooms shall be accessible through a hallway or corridor.

10. If possible, the equipment rooms need to be vertically stacked.

11. Equipment rooms can be located on alternate floors, provided the cabling distance stays within 300 feet maximum.

12. All equipment rooms require a dedicated HVAC system; this system should be able to maintain a temperature range of 64 to 75 degrees and have a dedicated system control located within the equipment room.

13. If possible, please avoid using the communication room as a pass through for plumbing, fire sprinkler systems or HVAC needs.

14. Space requirement only addresses VUIT needs, if additional low voltage is to be housed within the equipment room, then the space of the additional services will need to be addressed, and extra space may be required.