HARGIS TELECOMMUNICATIONS ASSESSMENT

DSHS

PINE LODGE

WA STATE PROJECT NUMBER: 2024-429 L (9)

EXECUTIVE SUMMARY

OVERVIEW

Pine Lodge (PL) is a facility south of the main Eastern State Hospital facility which is composed of multiple buildings. It was maintained and operated by the Department of Corrections but after a reorganization it has been utilized by Consolidated Support Services (CSS) for maintenance, shops, and other ancillary activities.

Hargis Engineers was retained to provide an assessment of the current Information Technology Network Infrastructure and develop recommendations for network improvements. The objective of the assessment was to review and evaluate the current campus backbone distribution system, the condition of horizontal cabling, telecommunications grounding, existing physical media types, physical pathways, physical spaces, and supporting electrical and mechanical systems and compare the existing conditions to current industry standards specific to this facility type. Excluded from the assessment were electronic systems, applications, and hardware, such as the network switches and servers. Buildings that have been planned for demolition or that have been decommissioned or included potential hazards have also been excluded from the assessment. (This includes the Residence Unit and the Living Unit.)

The existing campus telecommunications cabling backbone infrastructure includes inter-building optical fiber cabling and twisted-pair copper backbone cabling. The existing backbone cabling

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has been updated and modified several times over many years. The twisted pair copper backbone cabling is antiquated and is not able to support the deployment of new technologies nor does it comply with current industry standards. The Category 3 rated twisted-pair copper backbone is rated for traditional telephony service.

The existing horizontal cabling within buildings includes unshielded twisted pair copper cabling to provide connectivity to computers, telephones, printers, and other devices. The existing horizontal cabling is a mix Category 5e and Category 6 cabling depending on building. While it is sufficient to meet the current facility needs, it is not technically compliant with current standards for healthcare facilities, which require a minimum of Category 6A for all horizontal cabling.

Based on physical inspection and review of existing documentation, it is the determination of the team that the existing IT infrastructure does not comply with any of the current industry standards and that it will not support evolutions to modern and/or future technologies. The existing optical fiber infrastructure is obsolete, consisting mostly of OM3 50-micron multi-mode optical fiber cable and OS1 Single mode fiber optic cable. Improving the IP backbone connectivity will be a fundamental component to creating an environment that will permit Pine Lodge and DSHS to identify, adapt, and implement new technologies that contribute to safety and operational improvements.

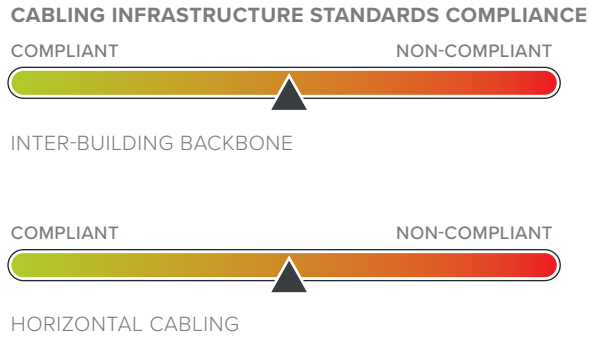
Existing horizontal cabling is not compliant with current TIA standards for this facility type. Upgrading category cabling requires a replacement of the complete channel to include horizontal cabling, patch cords, patch panels, and work area outlets. At Pine Lodge, this upgrade also requires installation of additional cabling to be compliant with port density requirements defined in TIA-1179.

In addition to the cabling noted above, the existing telecommunications spaces do not meet industry standards. Per TIA-1179 a dedicated telecommunications room is required on every floor to support the horizontal cabling infrastructure. Complying with the standard will require new/additional telecommunications rooms to be built on floors that do not currently have a telecommunication room. The additional telecommunications rooms will need to be equipped with supporting systems to include grounding, conduit sleeves, temperature control, and physical security of the space.

OBJECTIVES

The project objectives are as follows:

- Inventory and document the condition of the existing telecommunications infrastructure, including telecommunications spaces, pathways, backbone, and cabling.
- Identify current deficiencies.
- Recommend infrastructure improvements to bring the campus infrastructure into compliance with current codes and standards.
- Provide As-built drawings, documenting current conditions.
- Provide a ROM cost opinion for infrastructure improvements.



PROJECT APPROACH

Hargis conducted a site visit to review existing conditions including:

- Type of backbone cabling
- Overall architecture of backbone connectivity
- Supporting spaces and systems, including interior and exterior pathways and spaces (telecommunications vaults and rooms)
- Quantity, age, vintage, and condition of the horizontal cabling in each building.

The site review was limited by accessibility. Only what could be seen from plain view was evaluated, the team did not move furniture to look behind, and ceiling access was limited to minimize impact to the facility. Where cabling disappeared in walls and pathways, a certain level of deduction was used to determine the termination point, for example, we can assume that cabling for voice ports terminate at the voice cross connect on their respective floor.

As part of the assessment, the team recorded the existing conditions and the locations of voice and data ports for the purpose of creating as-built documentation. The as-builts include floor plans, enlarged telecom room plans, telecom rack elevations, butterfly diagrams, and a backbone cabling one-line diagram.

The team sought input from the stakeholder team and consulted current industry standards and best practices. Results from the assessment were analyzed and evaluated and a set of recommendations were developed to aid DSHS and Pine Lodge stakeholders in planning future network improvement projects, budget requests, and establishing priorities. Those recommendations were analyzed to determine a possible project sequence for constructability while limiting downtime for the facility, understanding that the facility will need to remain in operation during any project.

STANDARDS & CODES

- TIA-1179-B Healthcare Facility Telecommunications Infrastructure Standard
- TIA-5017 Telecommunications Physical Network Security Standard
- TIA-569 Telecommunications Pathways and Spaces
- BICSI Telecommunications Distribution Methods Manual, 14th Edition
- Health Insurance Portability and Accountability Act (HIPAA)

PROJECT APPROACH

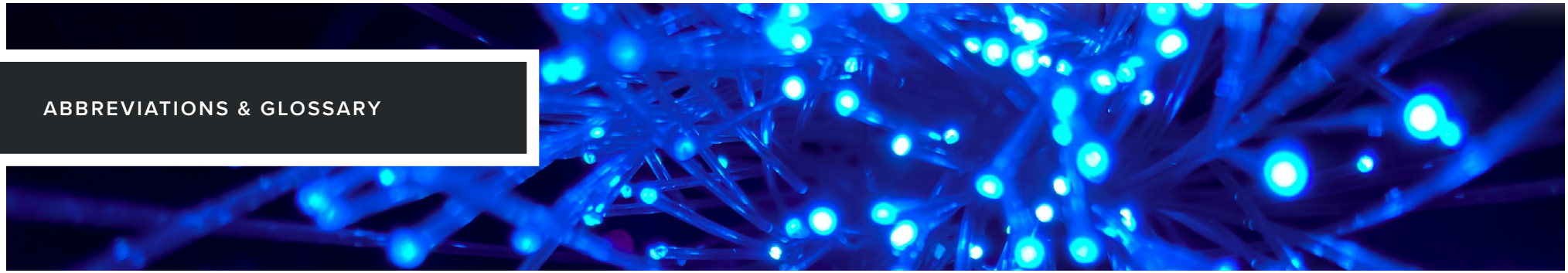
Review, assess and evaluate systems in each building

Identify the capabilities, deficiencies and vulnerabilities of each system

Provide recommendations for capital improvements to introduce, enhance, expand, or replace security system components as necessary

Develop a rough order of magnitude for the recommended improvement

Chart a migration path to optimize capital investments



ABBREVIATIONS & GLOSSARY

BEP **Building Entrance Protection**
Surge protective device used to mitigate risk of damage to equipment from conductive cabling exiting the building envelope.

BICSI **Building Industry Consulting Service International**
BICSI is a professional association supporting the advancement of information and communications technology (ICT) profession. They publish the Telecommunications Distribution Methods Manual (TDMM) and other Telecommunications standards.

EF **Entrance Facility**
An environmentally controlled centralized space for telecommunications equipment that usually houses a main or intermediate cross-connect. (TIA)

ER **Equipment Room**
A room in a building where public and private network services can enter the building and be consolidated.

HC **Horizontal Cross-Connect**
A cross-connect of horizontal cabling to other cabling, e.g., horizontal or backbone equipment.

IC **Intermediate Cross-Connect**
A cross-connect between first-level and second-level backbone cabling. This secondary cross-connect in the backbone cabling is used to mechanically terminate and administer backbone cabling between the main cross-connect and horizontal cross-connect (station cables).

IDF **Intermediate Distribution Facility**
Legacy term (no longer used) for what is now defined as the TR-HC or TR-IC

IP **Internet Protocol**
A standard addressing scheme and message routing protocol for communication between nodes of a data network.

ISP **Internet Service Provider**
A company that provides subscribers with access to the internet.

IT **Information Technology**
Use of any computers, storage, networking, and other physical devices, infrastructure, and processes to create, process, store, secure, and exchange all forms of electronic data.

LAN **Local Area Network**
Collection of devices connected together in one physical location, such as a building, office, or home. A LAN can be small or large, ranging from a home network with one user to an enterprise network with thousands of users and devices in an office or school.

MC **Main Cross-Connect**
The centralized portion of the backbone cabling used to mechanically terminate and administer the backbone cabling; this provides connectivity between equipment rooms, entrance facilities, horizontal cross-connects and intermediate cross-connects.

MDF **Main Distribution Frame**
Legacy term (no longer used) for what is now defined as the TR-MC and/or TR-MER

MER **Main Equipment Room**
Acts as the main IT location for a building. It is the transition point for all the voice and data cabling that enters the building, and we connect it further to the other equipment rooms.

MM **Multi-mode**
Type of optical fiber designed to carry multiple light rays or modes simultaneously, each at a marginally different reflection angle inside the optical fiber core.

OFC **Optical Fiber Cable**
An optical fiber cable is a type of cable that has a number of optical fibers bundled together, which are normally covered in their individual protective plastic covers. Optical cables are used to transfer digital data signals in the form of light up to distances of hundreds of miles with higher throughput rates than those achievable via electrical communication cables. All optical fibers use a core of hair-like transparent silicon covered with less refractive indexed cladding to avoid light leakage to the surroundings. Due to the extreme sensitivity of the optical fiber, it is normally covered with a high-strength, lightweight protective material like Kevlar.

OMX **Optical Mode**
(X represents the multi-mode fiber classification)
Optical Fiber Classification identifying the fiber type, core size, and properties for multi-mode optical fiber. Currently, OM1-5 are on the market. See Table 1 for more information.

OSX **Optical Single-mode**
(X represents the fiber construction)
Optical Fiber Classification identifying the fiber type and properties for single-mode optical fiber. Currently, OS1 and 2 are on the market. See Table 1 for more information.

OSP **Outside Plant Cabling**
Outside plant refers to all of the physical cablings and supporting infrastructure (such as conduit, cabinets, towers, or poles), as well as any associated hardware, placed between a demarcation point in one switching facility and another switching center or customer premises.

RMFC **Rack Mount Fiber Cabinet**
Also know as an LIU or Fiber Patch Panel. Enclosure mounted in a network rack to allow optical fiber to be terminated and cross-connected.

SM **Single-mode**
Common type of optical fiber that is used to transmit over longer distances. A single-mode fiber is a single glass fiber strand used to transmit a single mode or ray of light.

TIA **Telecommunications Industry Association**
Professional organization providing industry standards, professional certifications, and product standards to further the information communications technology industry.

TR **Telecommunications Room (previously known as IDF)**
An enclosed architectural space designed to contain telecommunications equipment, cable terminations, or cross-connect cabling.

VoIP **Voice over IP**
A technique that allows voice to be carried in a portion of the bandwidth of an Ethernet signal that is carrying IP traffic.

WAP **Wireless Access Point**
» A wireless access point (WAP) is a hardware device or configured node on a local area network (LAN) that allows wireless capable devices and wired networks to connect through a wireless standard, including Wi-Fi or Bluetooth. WAPs feature radio transmitters and antennae, which facilitate connectivity between devices and the Internet or a network.

» A WAP is also known as a hotspot.

SEQUENCING & RECOMMENDATIONS			
Phase	*Prerequisites*	*Scope*	*ROM Cost Opinion*
PHYSICAL CONSTRUCTION OF NEW TELECOMMUNICATIONS			
1	N/A	» Retrofit Telecommunications Rooms In Buildings A, B, C, E, F, H, J, K, M, N, S, & T. - Demolish any obsolete or non-operational existing equipment to make space. - Provide Electrical Infrastructure (Grounding, UPS, Convenience Receptacles, Equipment Receptacles, Power Distribution Units [PDUs]) - Provide dedicated cooling for TRs. - Access Control, add card reader and electrically locking hardware. - Install Supporting Equipment (Racks, Patch Panels, Cable Management, Rack Mount Fiber Cabinets (RMFC), Adaptor plates, Ladder Rack, etc.)	$1,112,000
INSTALL BACKBONE OFC TO NEW TELECOM SPACES			
2	N/A	» Pull 12 st OM4 OFC from MER in Building A to each telecom room in Buildings B, C, E, F, H, J, K, M, N, S, & T. - Terminate OFC Cabling if RMFC is installed.	$14,000
INSTALL HORISONTAL CABLING TO NEW TELECOMMUNICATIONS OUTLETS			
3	1	» Install Back boxes and pathway at new telecommunications outlet locations - Existing jacks will need to be maintained in operation. » Install Category 6A cabling and terminate for new telecommunications outlets.	$858,000
OWNER COORDINATION REQUIRED			
4	1-3	» Install new Ethernet Switches » Install Patch cables for active ports. » Cut over Existing workstations to the new infrastructure to allow demolition of existing telecommunications outlets. » Deploy system on new telecommunications infrastructure.	By Owner
INSTALL HORIZONTAL CABLING TO EXISTING TELECOMMUNICATIONS OUTLETS			
5	1-4	» Install Category 6A using existing pathway to existing telecommunications outlets and terminate. - Demolish existing horizontal cabling to existing telecommunications outlets.	$460,000
DEMOLISH DEFUNCT INFRASTRUCTURE			
6	1-5	» Demolish OSP cable. - Demolish OM3 Multi-mode OSP OFC to from Building A to Buildings B, C, E, F, H, J, K, M, N, S, & T. - Demolish Copper twisted pair OSP Backbone cabling between Building A to Buildings B, C, E, F, H, J, K, M, N, S, & T. » Demolish defunct telecommmunications rooms. - Remove any salvageable equipment from TR's. - Remove the remaining equipment and dispose of it.	$43,000

BACKBONE CABLING

Service Provider Connections

Category 3 twisted-pair copper backbone cabling enters the facility at the Administration Building in the MER. Although the analog voice infrastructure is in place, it is not active. During the site survey, it was discussed with staff onsite that Pine Lodge has moved to an IP phone system and that the existing twisted-pair backbone cabling is not currently in use.

Internet service is provided through Eastern State Hospital. Pine Lodge is connected to Eastern State Hospital through a 72-strand single-mode optical fiber backbone cable from the MER in the Administration Building at Eastern State Hospital to the MER in the Administration Building at Pine Lodge. Currently, the optical fiber backbone is utilized for telephony, state data services, and internet.

OPTICAL FIBER COMPARISON

Fiber Mode	Fiber Type	Jacket Color	Core Size	Data Rate	Distance	Application	Notes
Multi-mode	OM1	Orange	62.5 µm	1 Gb @ 850 nm wavelength	Up to 300 m	Short-haul networks, Local Area Networks (LANs), & Private networks	None
	OM2	Orange	50 µm	1 Gb @ 850 nm wavelength	Up to 600 m	Short-haul networks, Local Area Networks (LANs), & Private networks	Generally used for shorter distances. Has twice the distance as OM1.
	OM3	Aqua	50 µm	10 Gb @ 850 nm wavelength	Up to 300 m	Larger Private Networks	Able to run 40 GB or 100 GB up to 100 meters utilizing an MPO Connector.
	OM4	Aqua	50 µm	Up to 100 G	Up to 400 m	High-Speed Networks, Data Centers, Financial Centers, and Corporate Campuses	Able to run 100 GB up to 150 meters utilizing an MPO connector.
	OM5	Lime Green	50 µm	Up to 100 G	Up to 500 m	High Speed Networks and Data Centers that require greater link distances and higher speeds.	Designed to support Short Wavelength Division Multiplexing (SWDM)
Single-mode	OS1	Yellow	8-9 µm	Up to 10 G	Up to 6 mi	Moderate distance telecom links, LANs, buildings, factories, office parks, or campuses.	Tight Buffered Cable
	OS2	Yellow	8-9 µm	Up to 100 G	up to 124 mi	High Fiber count, long distance telco backbones, direct bury applications.	Loose Tube Cable

INTER-BUILDING BACKBONE CABLING

The existing communications infrastructure connecting to the facility and to the campus is provided by a variety of different fiber optic cables. Currently the backbone is composed of both multi-mode and single-mode optical fiber cabling. Pine Lodge is connected to Eastern State Hospital through a 72-strand single-mode optical fiber cable and to Lakeland Village through a 24-strand single-mode optical fiber cable. The optical fiber backbone originates at TR-07 within the Eastern State Hospital Administration Building.

The facility is also connected via Category 3 twisted-pair copper backbone cabling. Much of which has been abandoned over time or has limited connectivity.

The existing ethernet network is supported by multi-mode optical fiber backbone between buildings. The current backbone is OM3 optical fiber cable. While it has sufficient bandwidth and data speed to manage the current network load, it technically is not compliant with current TIA standards for healthcare facilities. TIA standards dictate the use of single-mode optical fiber or a minimum of OM4 rated multi-mode fiber. To meet current standards, it is recommended that the existing OM3 optical fiber backbone be augmented with an optical fiber backbone utilizing a minimum of 12-strands of single-mode outside plant optical fiber cable. The existing OM3 optical fiber backbone cabling can remain in place to be replaced in the future.

INTRA-BUILDING BACKBONE CABLING

Facility Buildings are supported by a mixture of 12 strand OM3 multi-mode and OS1 single-mode optical fiber cables provided between the MER and TR rooms within each building. To meet TIA standards, the backbone fiber cabling should be upgraded to a minimum of OM4 multi-mode and augmented with the addition of single-mode optical fiber cable. Providing 12-strand single-mode and 12-strand OM4 multi-mode optical fiber cables will provide an optical fiber backbone that is compliant with current industry standards.

Existing Copper Backbone.

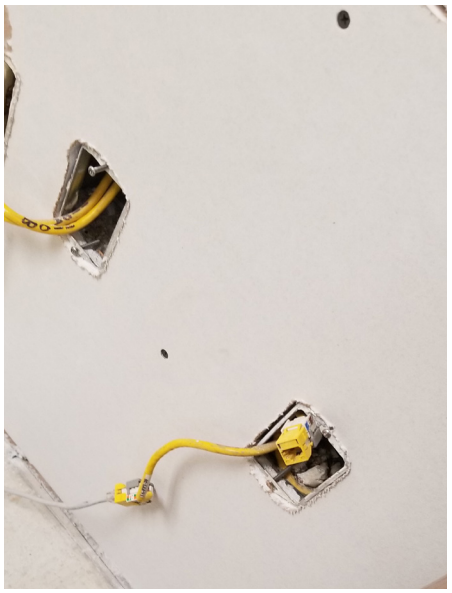
Existing Interbuilding Backbone Cabling.

Existing Fiber Backbone.

HORIZONTAL CABLING

CATEGORY CABLE COMPARISON				
Category	Max. Data Rate	Bandwidth	Max. Distance	Usage
Category 1	1 Mbps	0.4 MHz		Telephone and modem lines
Category 2	4 Mbps	4 MHz		LocalTalk & Telephone
Category 3	10 Mbps	16 MHz	100 m (328 ft.)	Telephone & 10BaseT Ethernet
Category 4	16 Mbps	20 MHz	100 m (328 ft.)	Token Ring
Category 5	100 Mbps	100 MHz	100 m (328 ft.)	100BaseT Ethernet
Category 5e	1 Gbps	100 MHz	100 m (328 ft.)	100BaseT Ethernet, Residential Homes
Category 6	1 Gbps	250 MHz	100 m (328 ft.) 10 Gb at 37 m (121 ft.)	Gigabit Ethernet, Commercial Buildings
Category 6A	10 Gbps	500 MHz	100 m (328 ft.)	Gigabit Ethernet in Data Centers & Commercial Buildings
Category 7	10 Gbps	600 MHz	100 m (328 ft.)	10 Gbps Core Infrastructure
Category 7A	10 Gbps	1000 MHz	100 m (328 ft.) 40 Gb at 50 m (164 ft.)	10 Gbps Core Infrastructure
Category 8	25 Gbps (Cat8.1) 40 Gbps (Cat8.2)	2000 MHz	30 m (98ft.)	25 Gbps/40 Gbps Core Infrastructure

Source: https://tripplite.eaton.com/products/ethernet-cable-types



Existing Data Ports Without Cover Plates.

Existing Category 5e Cabling.

Existing Category 6a Cabling.

Existing Voice & Data Outlet.

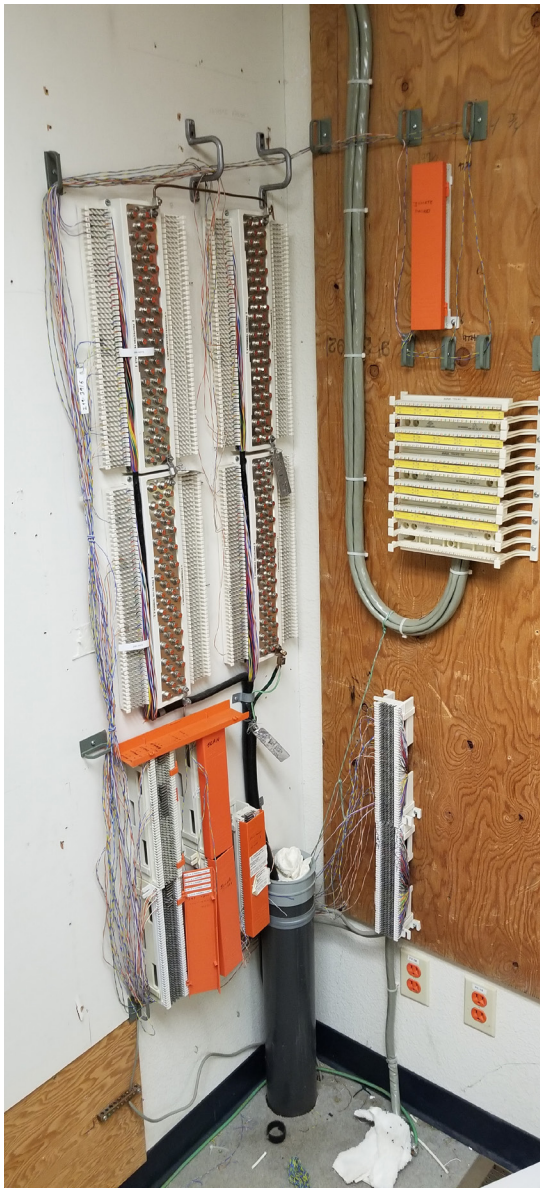
VOICE HORIZONTAL CABLING

Pine Lodge utilizes a common infrastructure for the data and voice cabling. The IP phone system horizontal cabling infrastructure is comprised of Category 5e and Category 6 cabling depending on the respective building.

Category 3 cabling does not meet TIA-1179 standards for horizontal cabling. Industry wide, its use has been on a rapid decline for years as it is not manufactured to meet current bandwidth or data rate standards. The existing voice cabling is in such poor condition that it is barely supporting the existing phone system. After years of modifications and multiple generations of cabling it is nearly impossible to maintain. It is recommended that all Category 3 cabling be removed, and the voice network be collapsed onto a converged network infrastructure utilizing standards compliant Category 6A cabling.

MICROSOFT TEAMS BANDWIDTH REQUIREMENTS PER ENDPOINT						
	MINIMUM		RECOMMENDED		BEST PERFORMANCE	
	Download	*Upload*	*Download*	*Upload*	*Download*	*Upload*
AUDIO						
One-to-One	10 kbps	10 kbps	58 kbps	58 kbps	76 kbps	76 kbps
Meetings	10 kbps	10 kbps	58 kbps	58 kbps	76 kbps	76 kbps
VIDEO						
One-to-One	150 kbps	150 kbps	1.5 Mbps	1.5 Mbps	4 Mbps	4 Mbps
Meetings	150 kbps	200 kbps	2.5 Mbps	4 Mbps	4 Mbps	4 Mbps
SCREEN SHARING						
One-to-One	200 kbps	200 kbps	1.5 Mbps	1.5 Mbps	4 Mbps	4 Mbps
Meetings	250 kbps	250 kbps	2.5 Mbps	2.5 Mbps	4 Mbps	4 Mbps
TOGETHER MODE						
Meetings	1 Mbps	1.5 Mbps	1.5 Mbps	2.5 Mbps	2.5 Mbps	4 Mbps

Source: https://learn.microsoft.com/en-us/microsoftteams/prepare-network



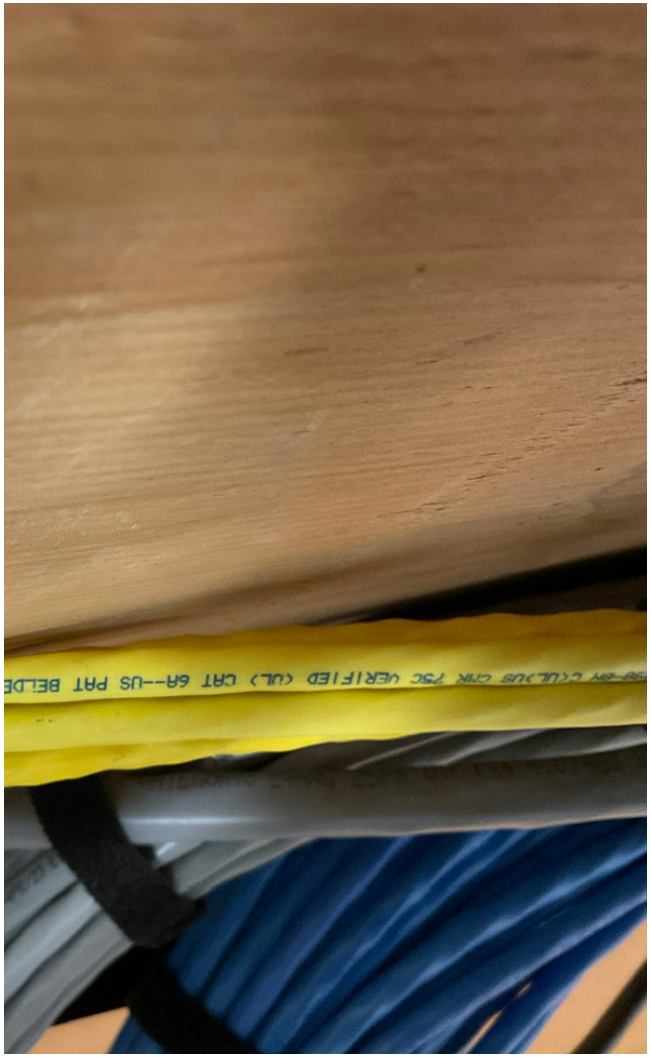
Existing Voice Patching.

ETHERNET HORIZONTAL CABLING

The existing ethernet network is comprised of Category 5e and Category 6 cabling. We could not ascertain the exact age of the existing horizontal cabling, but it appeared that most of it had been upgraded or recently installed. The existing patch panels, connectors, met Category 5e and Category 6 standards respective of the Category of the cabling installed in each building. While the existing cabling is sufficient to support the existing bandwidth and data speeds required by current network demands, it does not technically meet the TIA-1179 standards for healthcare facilities, therefore, our recommendation is to upgrade to Category 6A horizontal infrastructure.

Category 6A infrastructure supporting the Silas time clocks and wireless access points (WAPs) has been installed more recently. This existing infrastructure is in compliance with standards and should remain in place.

Meeting TIA-1179 standards requires the entire channel to be Category 6A certified, which requires all new patch panels, modular jacks, and wall outlets comprising a replacement of the entire infrastructure. Existing Category 5e, and Category 6 patch panels will be removed in favor of the Category 6A infrastructure. See sequencing and recommendations for sequencing of the project to minimize down time while the infrastructure is replaced.

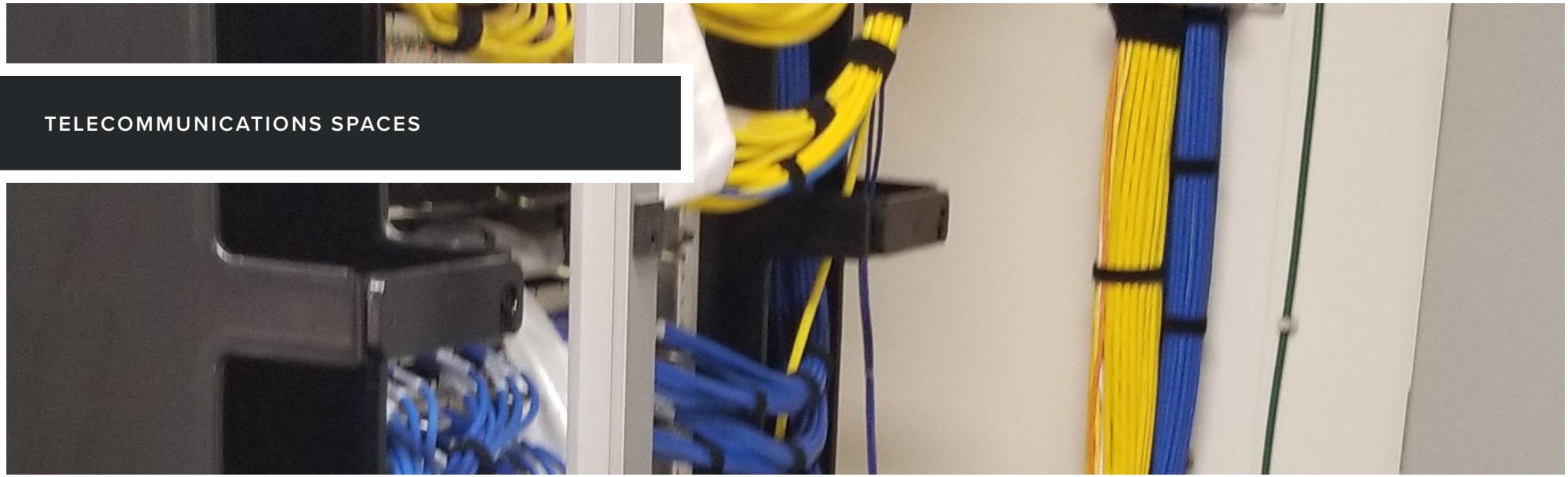


Existing Category 6A Cabling.

CAMPUS MAP

HARGIS

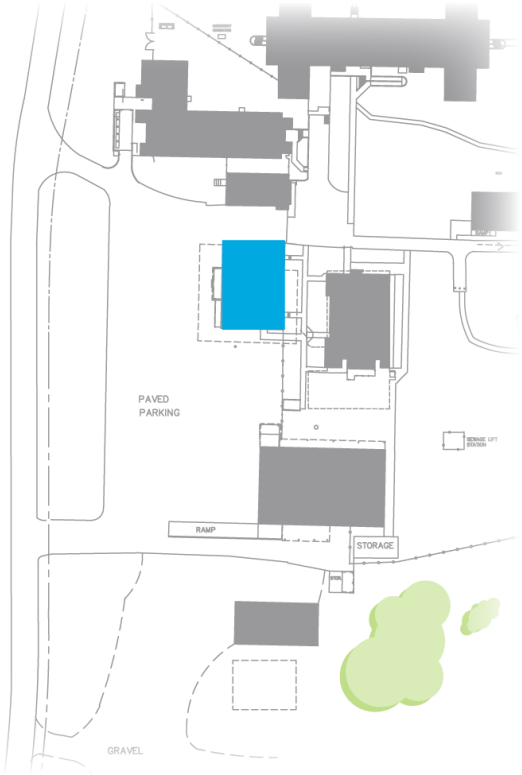
EVALUATION CRITERIA FOR TELECOMMUNICATIONS ROOMS	
Room/Space	» Quantity, Location, and Size of Telecommunications Room. » Available space to install and terminate new cabling and rack space to mount new equipment » Adequate working clearances to access and maintain additional equipment and cabling » Space is dedicated to telecommunications » Space is secured to prevent unauthorized access.
Racks	» Equipment racks with available space for new rack mounted network equipment required to support programs housed in building or area
Grounding & Bonding	» Grounding bus bar bonded to NEC recognized grounding systems » Equipment and cabling bonded to ground
UPS	» Uninterruptable Power Supply (UPS) in place and operational to provide backup power in case of power failure » UPS sized to provide adequate run time to support new network equipment
Cooling	» Dedicated cooling equipment for equipment housed in space » Expected life span of existing equipment » Adequate capacity to support new equipment
Backbone Cabling	» Existing fiber backbone with bandwidth and capacity to support current and future applications » Minimum of 12 single-mode and 12 multi-mode optical fiber cables.
Cable Management	» Cable trays and wall mounted support systems » Rack-mounted vertical and horizontal cable management systems
Pathway	» Dedicated telecommunications standard compliant pathways » Spare conduits available with capacity for new cabling



TELECOMMUNICATIONS SPACES

Pine Lodge has a wide range of existing telecommunications spaces. Some spaces are dedicated rooms meeting most standards while falling short on a few. Some of the spaces are shared spaces with mechanical equipment or in automotive shops. When evaluating these spaces, it is important to consider the existing building and use, and to factor in the extent of the telecommunications systems in that building. Where there are wall mounted racks in sharded spaces, it may not be feasible to build a dedicated telecommunications room, based on the existing architecture of the building and the limited telecommunications needs. Adding dedicated equipment power, telecommunications grounding, and a ventilated rack for cooling may be sufficient in those areas to support the desired equipment. Evaluating the existing power infrastructure, cooling, cable management, rack space, grounding, and UPS power for each space, while considering the building and its telecommunications needs, led to the recommendations listed in the room summaries.

To support future expanded infrastructure and meet industry standards, it is recommended to improve existing telecommunications rooms or build new telecommunications rooms as needed. New telecommunications rooms will require power upgrades to provide convenience receptacles and dedicated equipment receptacles. Uninterruptible Power Supplies (UPS) should be provided to provide clean power, protect equipment from transients, and provide backup power. Dedicated cooling should be provided to maintain equipment temperature and humidity levels. Network support equipment will have to be provided: racks, grounding, ladder rack, Category 6A patch panels. To comply with the Health Insurance Portability and Accountability Act (HIPAA) and meet telecommunications standards, access to the space will need to be provided to limit access to authorized staff. Access control can be accomplished using different methods, including, keys and locks or an electronic access control system. Per HIPAA security requirements, the entity must "Implement procedures to control and validate a person's access to facilities based on their role or function…" Electronic access control systems have this capability built in. This capability can be accomplished for keys and locks using third-party key control systems like Keywatcher or other manual processes of controlling the physical keys, which allows keys to be checked out after entering a code or some other means of identifying information to validate a person's access to the telecommunications spaces. See room summaries later in this document.



STANDARDS COMPLIANCE

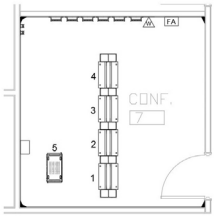
COMPLIANT — NON-COMPLIANT

SCOPE PRIORITIZATION

LOW PRIORITY — HIGH PRIORITY

ADMIN BUILDING

Administration is a single story building central to the Pine Lodge facility. This building provides office and meeting space along with the facility MER. This MER provides connectivity to the buildings at this facility and connection to the Eastern State Hospital (ESH) and Lakeland Village (LV) facilities via optical fiber backbone.



MAIN EQUIPMENT ROOM – MER-07

MER-07 is the Main Equipment Room for the facility along with acting as the telecommunications room for the building. It occupies a space that was formerly a conference room. This room includes multiple floor mounted racks with cable tray routed around the room. One rack supports multiple rack mounted fiber cabinets. The second rack includes a rack mount fiber cabinet at the top, a PLC and associated equipment, network switch, and some optical fiber media converters. The third rack contains a phone, some media converters, and a UPS. The fourth rack contains copper patch panels and network switches. Connectivity to ESH and LV is provided through single-mode optical fiber backbone cables, 1 12-strand to LV and 72-strand to ESH. 12-strand single-mode and 12-strand OM3 multi-mode optical fiber backbone cables provide connectivity to the other Pine Lodge buildings and terminate on rack mount fiber cabinets. Twisted-pair copper cables are provided to each building for analog phone service.

Existing horizontal cabling is Category 6, and it is utilized for both data and voice cabling. It was observed that some of the OM3 optical fiber cabling was patched with an OM1 patch cord. This size mismatch (50 µm to 62.5 µm) creates light reflectivity and introduces noise and signal degradation.

The existing backbone and horizontal cabling are sufficient to meet current facility needs, however, they do not technically meet current TIA standards for healthcare facilities. To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports should be provided as required to meet standards. Dedicated cooling, cable management, and dedicated equipment receptacles are required to meet standards. The addition of card-based access control is recommended to control and track access to the space.

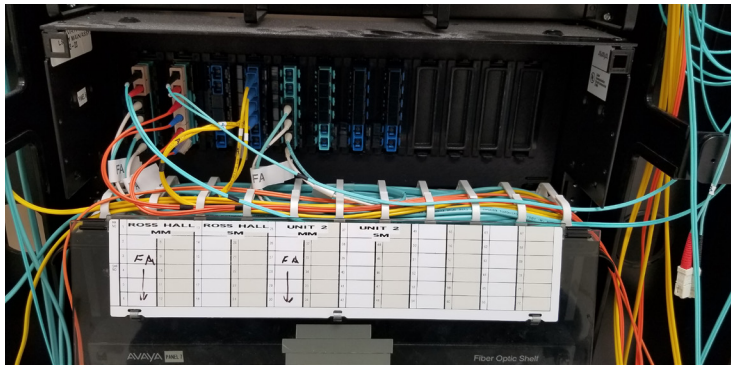
MAIN EQUIPMENT ROOM – MER-07

Deficiencies:

- Backbone Cabling infrastructure does not meet TIA-1179.
- Horizontal Cabling is sufficient but does not meet TIA-1179.
- Electrical infrastructure does not meet minimum requirements per standards.
- Uncontrolled access to space with no identity verification.

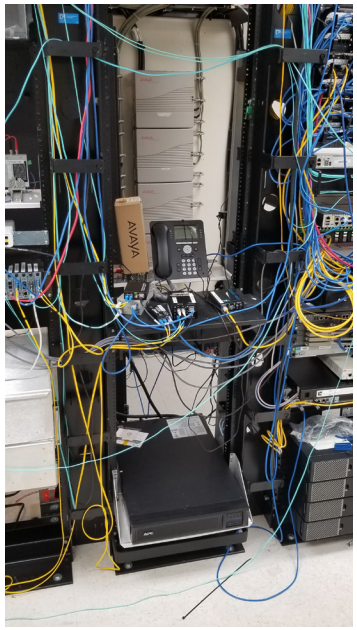
Recommendations:

- Upgrade existing port locations to Category 6A.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide labels for all new cabling and existing cables to remain.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.

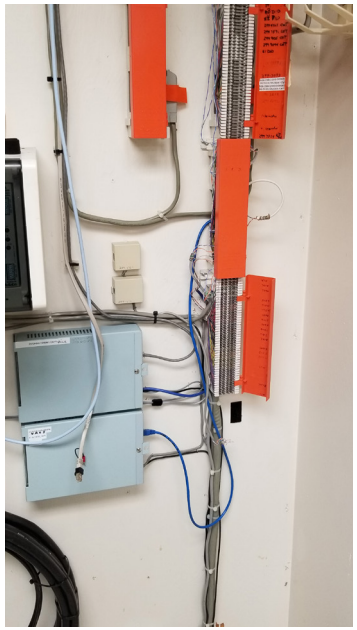


Existing Fiber Mismatch.

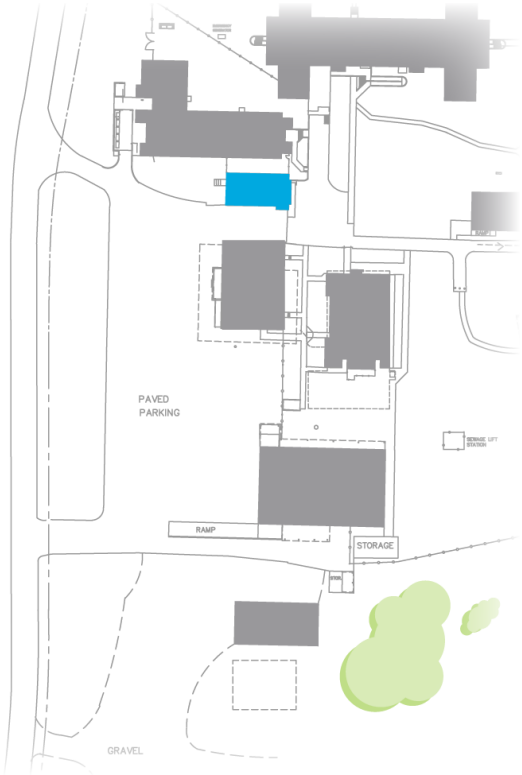
Existing Server Rack.



Existing Telecom Racks.



Existing Voice Patching.



STANDARDS COMPLIANCE

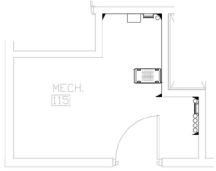
COMPLIANT — NON-COMPLIANT

SCOPE PRIORITIZATION

LOW PRIORITY — HIGH PRIORITY

SECURE HOUSING UNIT

Originally utilized as secure short-term housing this building is currently inactive.



TELECOMMUNICATIONS ROOM – TR-115

TR-115 is the telecommunications room supporting the building. It is in a shared mechanical space. The telecommunications space includes a wall mounted half rack cabinet and pathway. The cabinet includes a rack mount fiber cabinet and copper patch panels. 110 blocks for patching and other telephone equipment are wall mounted near the rack. Connectivity is provided via 12-strand single-mode and 12-strand multi-mode fiber optical backbone cables to the MER. Existing horizontal cabling is Category 5e for both data and voice cabling.

The existing telecommunications space is not standards compliant. However, due to the small size of the building, the lack of other more suitable spaces, and the fact that the building is inactive, we recommend maintaining the space as the telecommunications room. The existing backbone and horizontal cabling are sufficient to meet current facility needs, however, they do not technically meet current TIA standards for healthcare facilities. To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports should be provided as required to meet standards. Dedicated cooling, cable management, and dedicated equipment receptacles are required to meet standards. The addition of card-based access control is recommended to control and track access to the space.

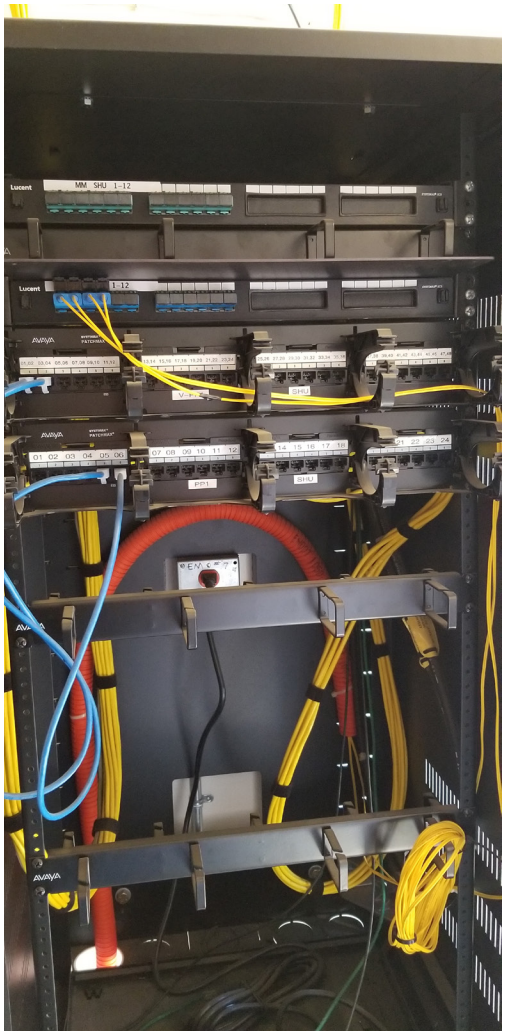
Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- No dedicated cooling system to maintain temperature of equipment.
- Electrical infrastructure does not meet minimum requirements per standards.
- Uncontrolled access to space with no identity verification.

Recommendations:

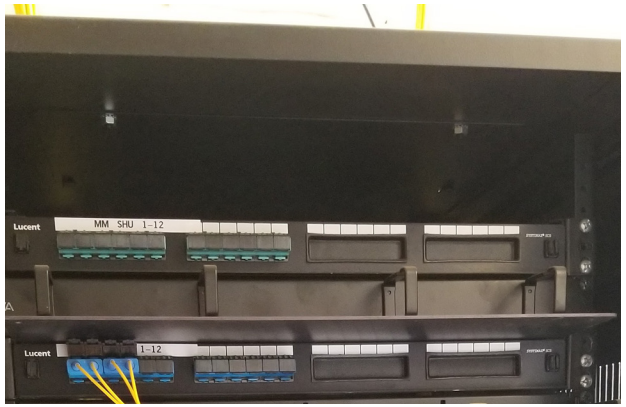
- Upgrade existing port locations to Category 6A.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide labels for all new cabling and existing cables to remain.
- Provide 12-strand OM4 multi-mode optical fiber backbone from MER in the Admin Building.
- Add dedicated cooling system.
- Add power circuits and receptacles as needed.
- A properly sized UPS should be installed.

TELECOMMUNICATIONS ROOM – TR-115

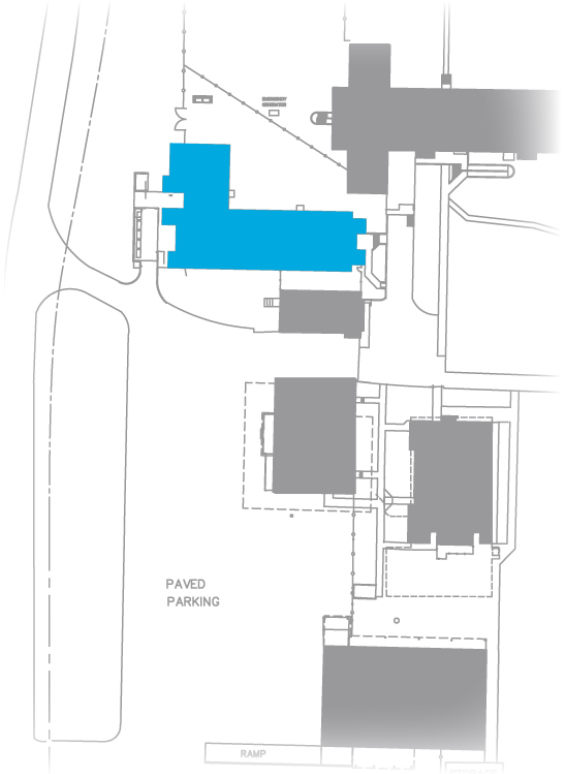


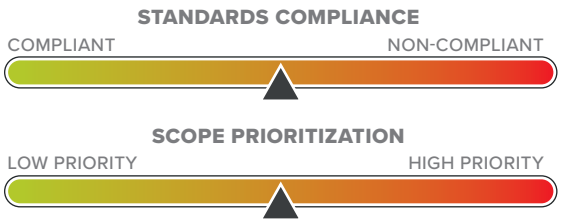
Existing Telecom Cabinet.

Existing Voice Patching.

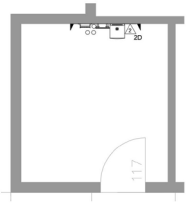


Existing Fiber Patching.





KITCHEN/DINING



Originally utilized as a kitchen facility this building has been repurposed primarily as a wood shop and other support tasks.

TELECOMMUNICATIONS ROOM – TR-117

TR-117 is the telecommunications room supporting the building. It is in a shared electrical space. The telecommunications space includes a wall mounted half rack cabinet and pathway. The cabinet includes a rack mount fiber cabinet, copper patch panels, and network switches. 110 blocks for patching and other telephone equipment are wall mounted near the rack. Connectivity is provided via 12-strand single-mode and 12-strand multi-mode fiber optical backbone cables to the MER. The optical fiber backbone connection to Lakeland Village connects here. Existing horizontal cabling is Category 5e for both data and voice cabling. No UPS was observed.

The existing telecommunications space is not standards compliant. However, due to the small size of the building, the lack of other more suitable spaces, and the fact that the building is inactive, we recommend maintaining the space as the telecommunications room. The existing backbone and horizontal cabling are sufficient to meet current facility needs, however, it does not technically meet current TIA standards for healthcare facilities. To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports should be provided as required to meet standards. Dedicated cooling, cable management, and dedicated equipment receptacles are required to meet standards. The addition of card-based access control is recommended to control and track access to the space.

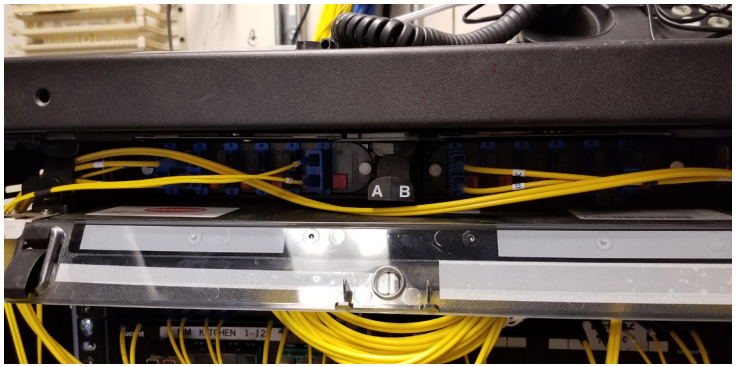
Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal overhead ladder tray for cable support, leading to cables being draped or placed directly on equipment.
- No dedicated cooling system to maintain temperature of equipment.
- Electrical infrastructure does not meet minimum requirements per standards.
- Uncontrolled access to space with no identity verification.

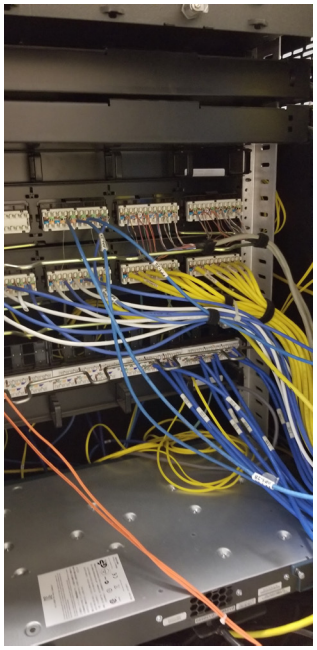
Recommendations:

- Upgrade existing port locations to Category 6A.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide labels for all new cabling and existing cables to remain.
- Provide 12-strand OM4 multi-mode optical fiber backbone from MER in the Admin Building.
- Add ladder tray and cable management as needed.
- Add dedicated cooling system.
- Add power circuits and receptacles as needed.
- A properly sized UPS should be installed.

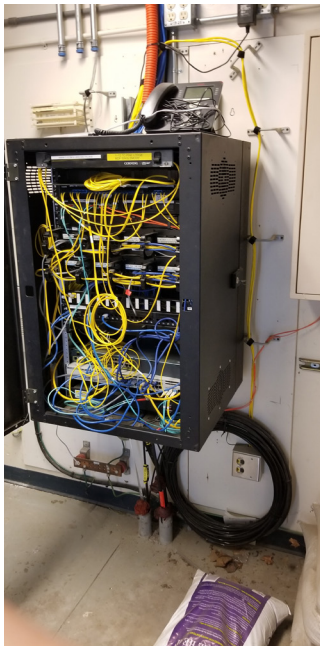
TELECOMMUNICATIONS ROOM – TR-117



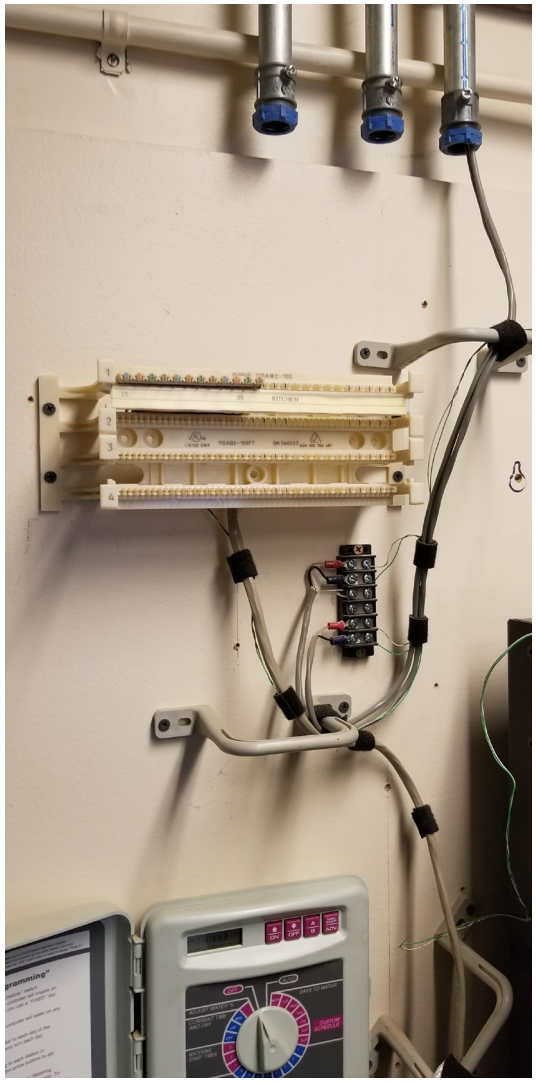
Existing Fiber Patching.



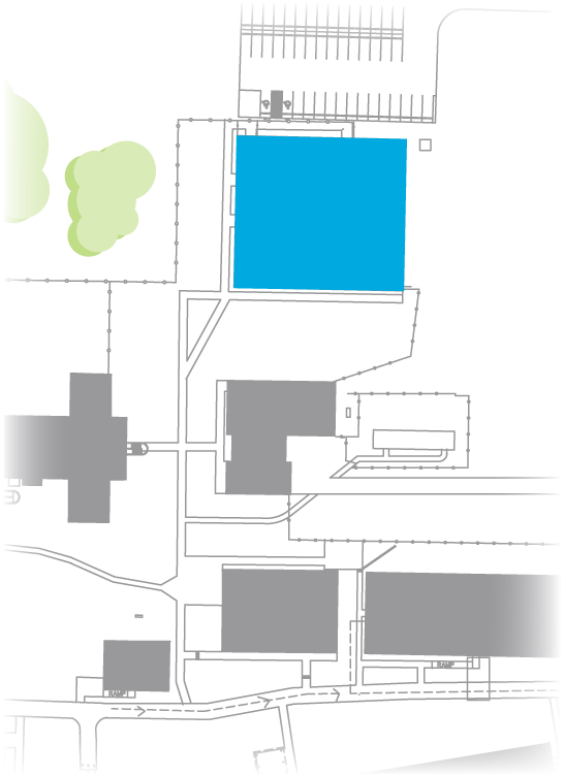
Existing Data Patching.



Existing Telecom Cabinet.



Existing Voice Patching.



STANDARDS COMPLIANCE

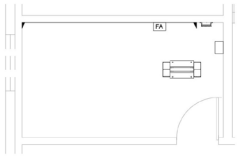
COMPLIANT — NON-COMPLIANT

SCOPE PRIORITIZATION

LOW PRIORITY — HIGH PRIORITY

SERVICE CENTER

The Service Center includes a two-story section with storage and office space, computer lab, and a main gym section.



EQUIPMENT PLAN

TELECOMMUNICATIONS ROOM – TR-MECH

Telecommunications Room TR-MECH is a shared space containing mechanical and telecommunications equipment. The telecommunications room includes a full height rack and ladder rack to support cabling. The rack includes a rack mount fiber cabinet, copper patch panels, network switches, media converters, and a UPS. Telephone equipment and mechanical controls are wall mounted near the rack. Connectivity is provided via 12-strand single-mode and 12-strand OM3 multi-mode optical fiber backbone cables, and a 100-pair twisted-pair Category 3 copper backbone cable to the MER within the Admin building. One of the optical fiber patch cords being utilized is an OM1 multi-mode patch cord patched to OM3 fiber. The size mismatch (62.5 µm to 50 µm) creates light reflectivity and introduces noise and signal degradation. Existing horizontal cabling is Category 5e for both data and voice cabling.

The existing backbone and horizontal cabling are sufficient to meet current facility needs, however, it does not technically meet current TIA standards for healthcare facilities. To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports should be provided as required to meet standards. Dedicated cooling, cable management, and dedicated equipment receptacles are required to meet standards. The addition of card-based access control is recommended to control and track access to the space.

Deficiencies:

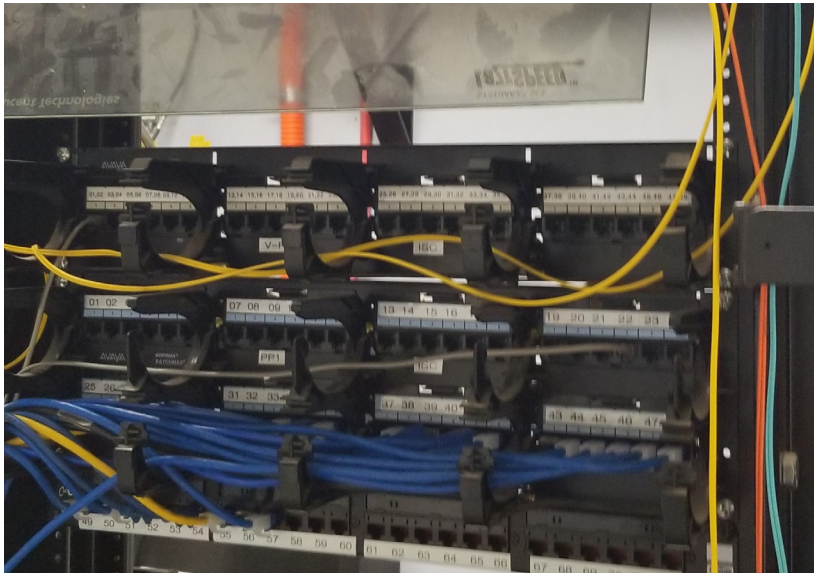
- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- No dedicated cooling system to maintain temperature of equipment.
- Electrical infrastructure does not meet minimum requirements per standards.
- Uncontrolled access to space with no identity verification.

Recommendations:

- Upgrade existing port locations to Category 6A.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide labels for all new cabling and existing cables to remain.
- Provide 12-strand OM4 multi-mode optical fiber backbone from MER in the Admin Building.
- Add dedicated cooling system.
- Add power circuits and receptacles as needed.

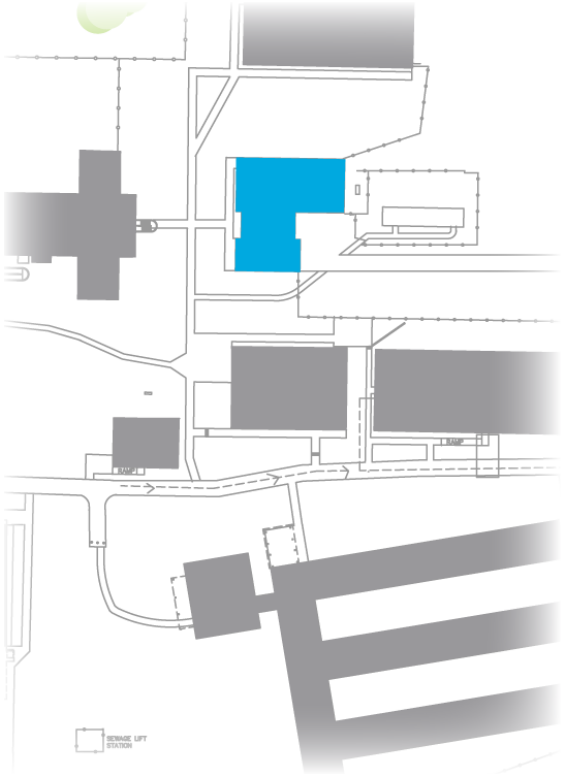
TELECOMMUNICATIONS ROOM – TR-MECH

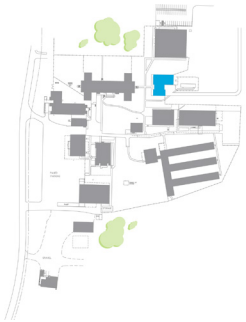
Existing Fiber Mismatch.



Existing Data Patching.

Existing Telecom Rack.





STANDARDS COMPLIANCE

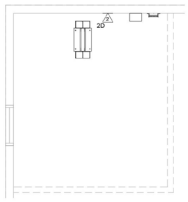
COMPLIANT — NON-COMPLIANT

SCOPE PRIORITIZATION

LOW PRIORITY — HIGH PRIORITY

PROPERTY/LAUNDRY

Originally utilized as a laundry facility this building has been repurposed primarily for other support tasks.



TELECOMMUNICATIONS ROOM – TR-101

Telecommunications Room TR-101 is a shared space containing mechanical and telecommunications equipment. The telecommunications room includes a floor mounted rack and ladder rack to support cabling. The rack contains a rack mount fiber cabinet, copper patch panels, network switches, and a UPS. Telephone equipment and mechanical controls are mounted near the rack. Connectivity is provided via 12-strand single-mode and 12-strand OM3 multi-mode optical fiber backbone cables to the MER. Existing horizontal cabling is Category 5e for both data and voice cabling.

The existing backbone and horizontal cabling are sufficient to meet current facility needs, however, it does not technically meet current TIA standards for healthcare facilities. To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports should be provided as required to meet standards. Dedicated cooling, cable management, and dedicated equipment receptacles are required to meet standards. The addition of card-based access control is recommended to control and track access to the space.

Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- No dedicated cooling system to maintain temperature of equipment.
- Electrical infrastructure does not meet minimum requirements per standards.
- Uncontrolled access to space with no identity verification.

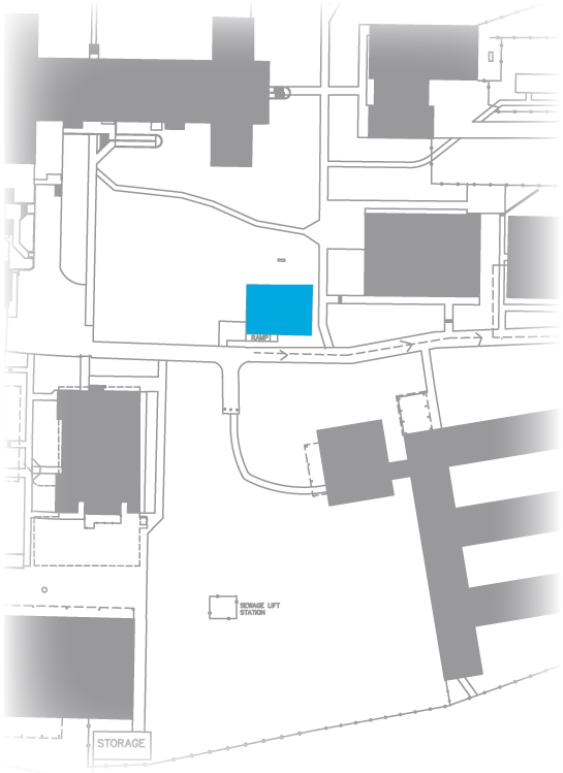
Recommendations:

- Upgrade existing port locations to Category 6A.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide labels for all new cabling and existing cables to remain.
- Provide 12-strand OM4 multi-mode optical fiber backbone from MER in the Admin Building.
- Add dedicated cooling system.
- Add power circuits and receptacles as needed.

TELECOMMUNICATIONS ROOM – TR-101

Existing Voice Patching.

Existing Data Patching.



STANDARDS COMPLIANCE

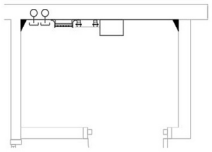
COMPLIANT — NON-COMPLIANT

SCOPE PRIORITIZATION

LOW PRIORITY — HIGH PRIORITY

CHAPEL

Originally utilized as a chapel this building was at the time of the survey being refitted to allow for wood shop equipment.



TELECOMMUNICATIONS ROOM – TR-A105

At the time of the survey, the building was under construction and a purpose-built telecommunications room was being constructed. All equipment was wall mounted and included, at the time of the survey, a rack mount fiber cabinet and a copper patch panel. A network switch and UPS were planned for the telecommunications room as well. Connectivity is provided via 12-strand single-mode and a 12-strand OM3 multi-mode optical fiber backbone cables to the MER within the Admin building. Existing horizontal cabling is Category 5e for both data and voice cabling.

The existing backbone and horizontal cabling are sufficient to meet current facility needs, however, it does not technically meet current TIA standards for healthcare facilities. To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports should be provided as required to meet standards. The telecommunications room was still under construction but should include dedicated cooling, ladder rack, cable management, and dedicated equipment receptacles to meet standards. The addition of card-based access control is recommended to control and track access to the space.

Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal overhead ladder tray for cable support, leading to cables being draped or placed directly on equipment.
- No dedicated cooling system to maintain temperature of equipment.
- Electrical infrastructure does not meet minimum requirements per standards.
- No UPS for backup power.
- Uncontrolled access to space with no identity verification.

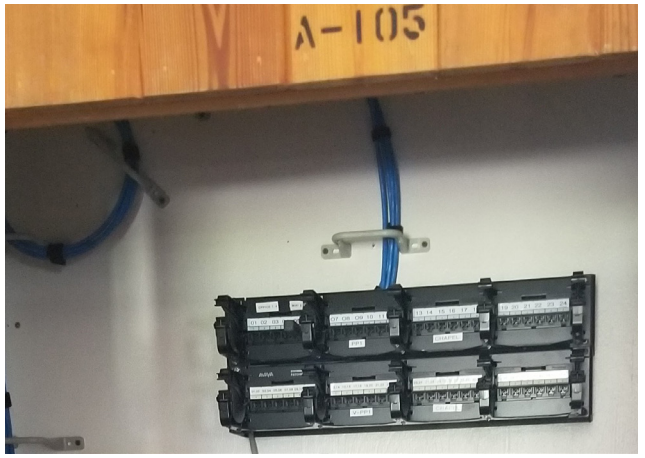
Recommendations:

- Upgrade existing port locations to Category 6A.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide labels for all new cabling and existing cables to remain.
- Provide 12-strand OM4 multi-mode optical fiber backbone from MER in the Admin Building.
- Add ladder tray and cable management as needed.
- Add dedicated cooling system.
- Add power circuits and receptacles as needed.
- A properly sized UPS should be installed.
- Control access to authorized individuals.

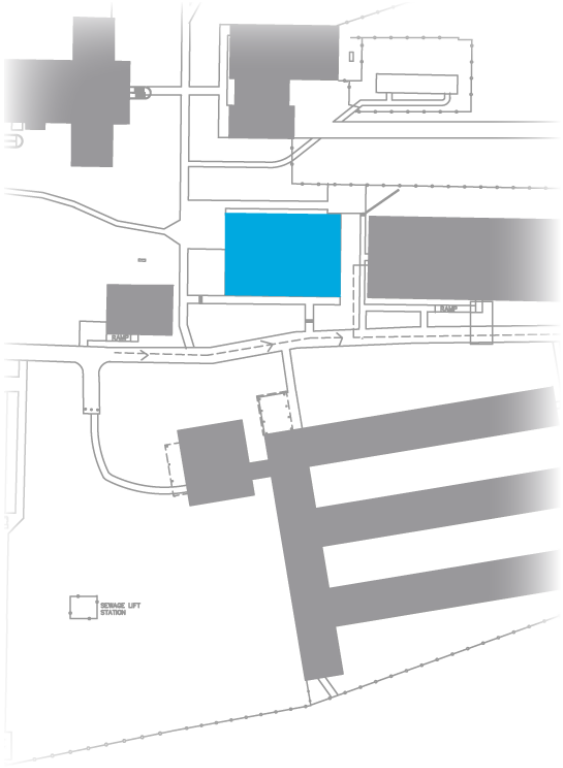
TELECOMMUNICATIONS ROOM – TR-A105

Existing Voice Patching.

Existing Fiber Cabinet.



Existing Patch Panel.



STANDARDS COMPLIANCE

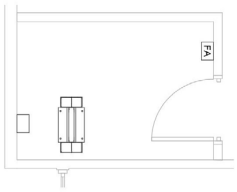
COMPLIANT — NON-COMPLIANT

SCOPE PRIORITIZATION

LOW PRIORITY — HIGH PRIORITY

WALKER HALL

Walker Hall is a small building central to the facility that provided office space. A portion of the building has been refitted to allow for paint shop functions.



TELECOMMUNICATIONS ROOM – TR-OFFICE

Telecommunications Room TR-OFFICE is a dedicated telecommunications room for the building. It includes a floor mounted rack and ladder rack to support cabling. The rack contains a rack mount fiber cabinet, copper patch panels, and a network switch. Telephone equipment is wall mounted behind the rack. Connectivity is provided via 12-strand single-mode and 12-strand OM3 multi-mode optical fiber backbone cables to the MER within the Admin building. Existing horizontal cabling is Category 5e for both data and voice cabling. No UPS was observed.

The existing backbone and horizontal cabling are sufficient to meet current facility needs, however, it does not technically meet current TIA standards for healthcare facilities. To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports should be provided as required to meet standards. Dedicated cooling, cable management, and dedicated equipment receptacles are required to meet standards. The addition of card-based access control is recommended to control and track access to the space.

Deficiencies:

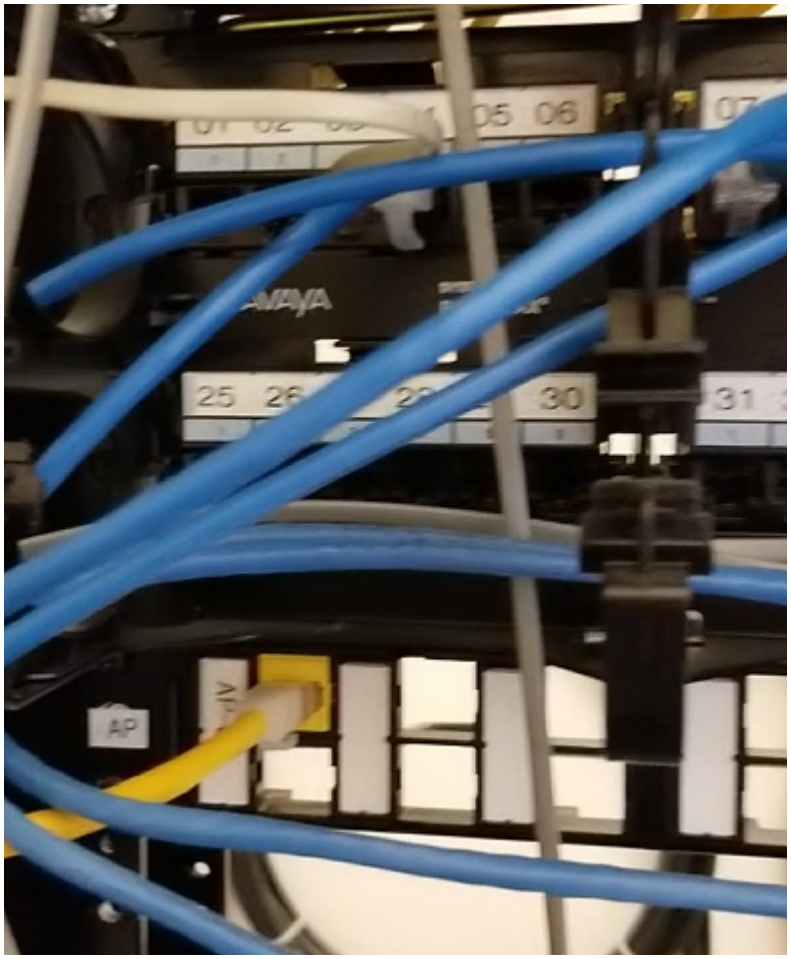
- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Electrical infrastructure does not meet minimum requirements per standards.
- Uncontrolled access to space with no identity verification.
- No UPS installed.

Recommendations:

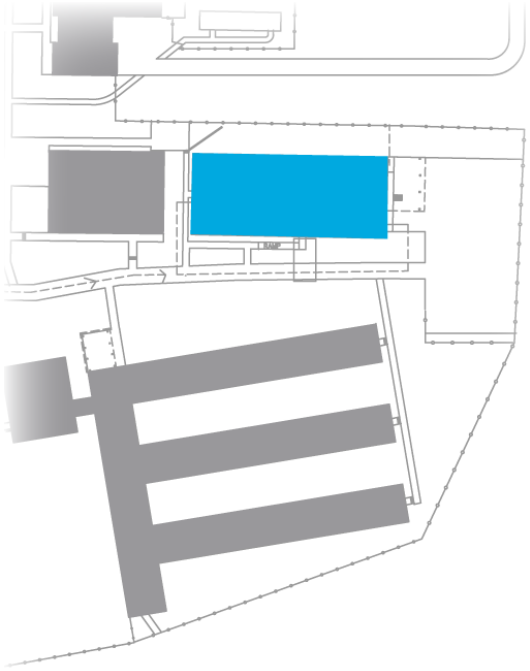
- Upgrade existing port locations to Category 6A.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide labels for all new cabling and existing cables to remain.
- Provide 12-strand OM4 multi-mode optical fiber backbone from MER in the Admin Building.
- Add power circuits and receptacles as needed.
- A properly sized UPS should be installed.

TELECOMMUNICATIONS ROOM – TR-OFFICE

Existing Voice Patching.

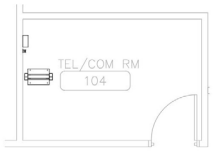


Existing Data Patching.



EDUCATION

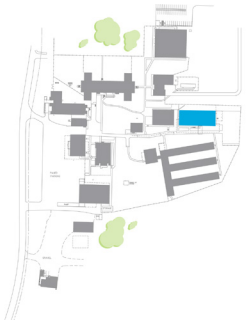
This building provides classroom, office, and support space.

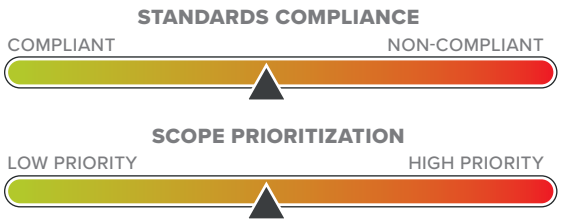


TELECOMMUNICATIONS ROOM – TR-104

Telecommunications Room TR-104 is a dedicated telecommunications room for the building. It includes a floor mounted rack and ladder rack to support cabling. The rack contains a rack mount fiber cabinet, copper patch panels, and a network switch. Telephone equipment is wall mounted behind the rack. Connectivity is provided via 12-strand single-mode and 12-strand OM3 multi-mode optical fiber backbone cables to the MER within the Admin building. Existing horizontal cabling is Category 6 for both data and voice cabling. No UPS was observed.

The existing backbone and horizontal cabling are sufficient to meet current facility needs, however, it does not technically meet current TIA standards for healthcare facilities. To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports should be provided as required to meet standards. Dedicated cooling, cable management, and dedicated equipment receptacles are required to meet standards. The addition of card-based access control is recommended to control and track access to the space.





Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Electrical infrastructure does not meet minimum requirements per standards.
- Uncontrolled access to space with no identity verification.
- No UPS installed.

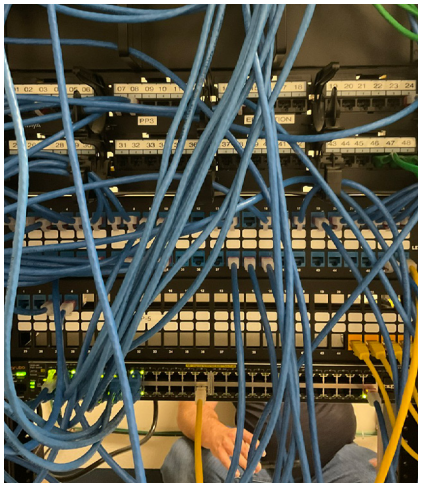
Recommendations:

- Upgrade existing port locations to Category 6A.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide labels for all new cabling and existing cables to remain.
- Provide 12-strand OM4 multi-mode optical fiber backbone from MER in the Admin Building.
- Add power circuits and receptacles as needed.
- A properly sized UPS should be installed.

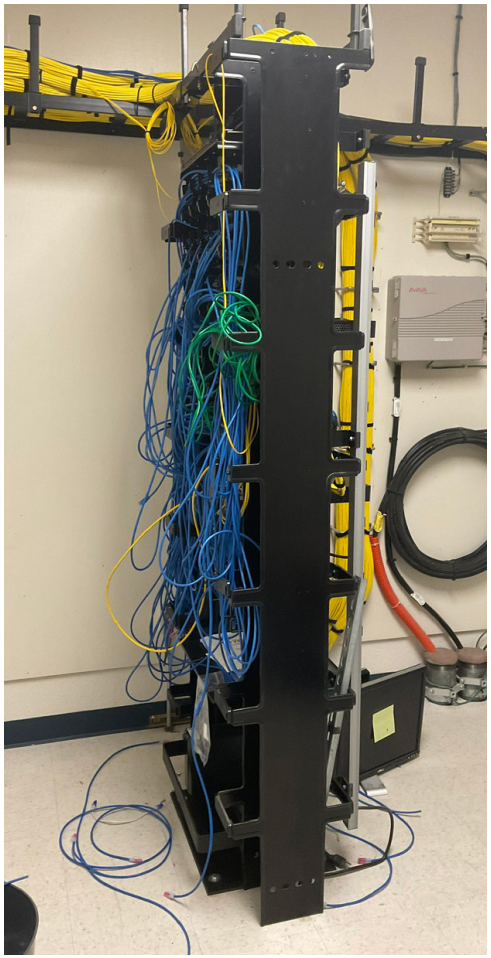
TELECOMMUNICATIONS ROOM – TR-104

Existing Voice Patching.

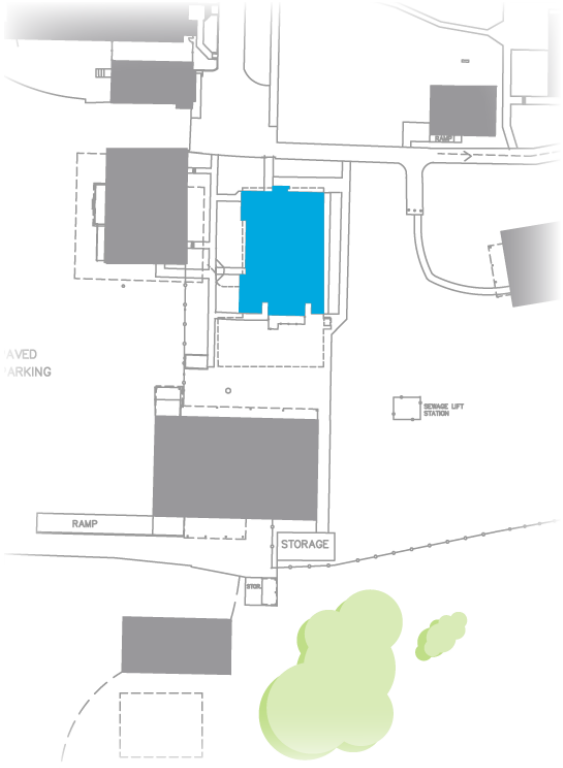
Existing Fiber Patching.

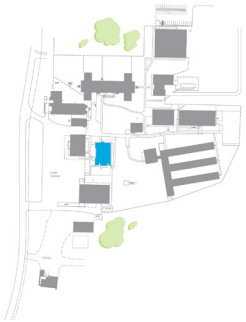


Existing Data Patching.



Existing Telecom Rack.





STANDARDS COMPLIANCE

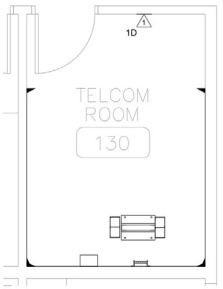
COMPLIANT — NON-COMPLIANT

SCOPE PRIORITIZATION

LOW PRIORITY — HIGH PRIORITY

MEDICAL

This building was primarily utilized for medical office space but has since been refitted to accommodate office space to support CSS functions and provide meeting space.



TELECOMMUNICATIONS ROOM – TR-130

Telecommunications Room TR-130 is a dedicated telecommunications room for the building. It includes a floor mounted rack and ladder rack to support cabling. The rack contains a rack mount fiber cabinet, copper patch panels, and a network switch. Telephone equipment is wall mounted behind the rack. Connectivity is provided via 12-strand single-mode and 12-strand OM3 multi-mode optical fiber backbone cables to the MER within the Admin building. Existing horizontal cabling is Category 6 for both data and voice cabling. No UPS was observed.

The existing backbone and horizontal cabling are sufficient to meet current facility needs, however, it does not technically meet current TIA standards for healthcare facilities. To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports should be provided as required to meet standards. Dedicated cooling, cable management, and dedicated equipment receptacles are required to meet standards. The addition of card-based access control is recommended to control and track access to the space.

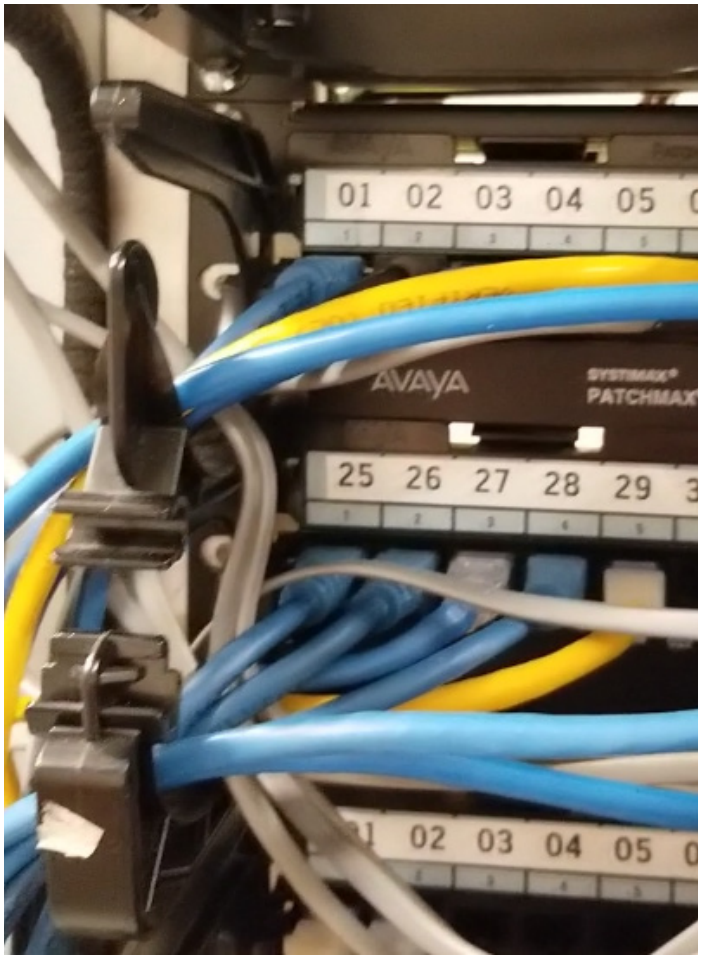
Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Electrical infrastructure does not meet minimum requirements per standards.
- Uncontrolled access to space with no identity verification.

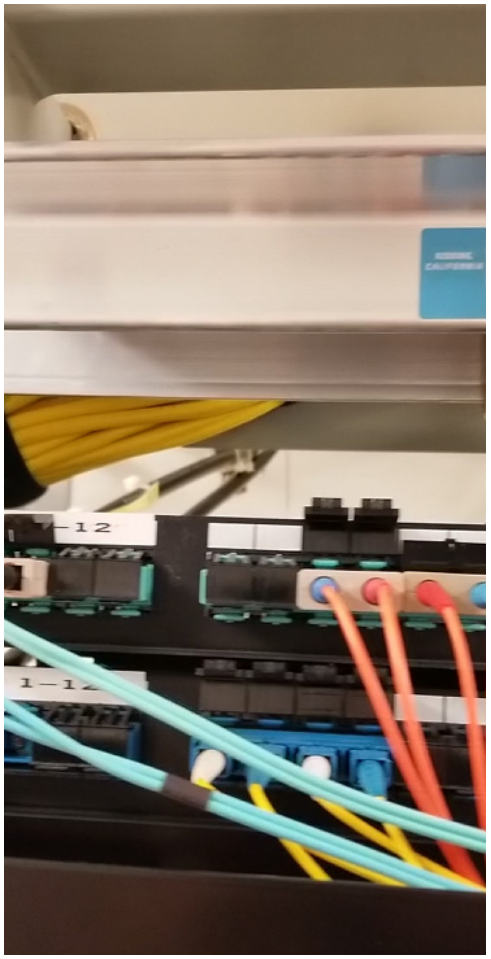
Recommendations:

- Upgrade existing port locations to Category 6A.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide labels for all new cabling and existing cables to remain.
- Provide 12-strand OM4 multi-mode optical fiber backbone from MER in the Admin Building.
- Add power circuits and receptacles as needed.

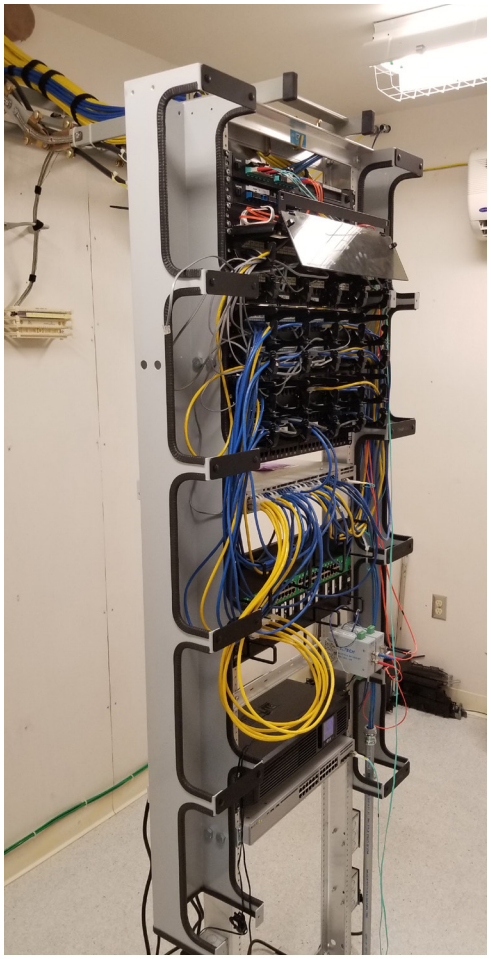
TELECOMMUNICATIONS ROOM – TR-130



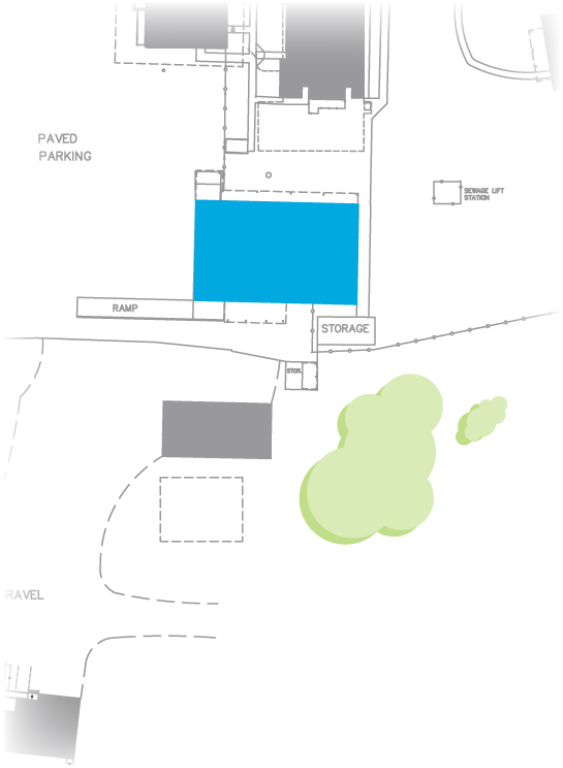
Existing Data Patching.

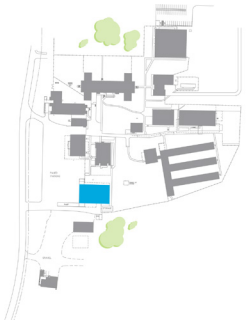


Existing Fiber Patching.



Existing Telecom Rack.





STANDARDS COMPLIANCE

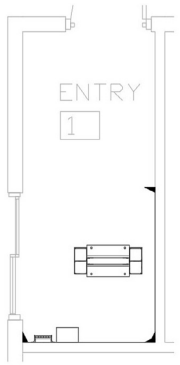
COMPLIANT — NON-COMPLIANT

SCOPE PRIORITIZATION

LOW PRIORITY — HIGH PRIORITY

WAREHOUSE/SHOPS

This building provides shop space for various maintenance departments.



TELECOMMUNICATIONS ROOM – TR-1

Telecommunications Room TR-1 is a dedicated telecommunications room for the building. It includes a floor mounted rack and ladder rack to support cabling. The rack contains a rack mount fiber cabinet, copper patch panels, and a network switch. Telephone equipment is wall mounted behind the rack. Connectivity is provided via 12-strand single-mode and 12-strand OM3 multi-mode optical fiber backbone cables to the MER within the Admin building. Existing horizontal cabling is Category 5e for both data and voice cabling.

The existing backbone and horizontal cabling are sufficient to meet current facility needs, however, it does not technically meet current TIA standards for healthcare facilities. To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports should be provided as required to meet standards. Dedicated cooling, cable management, and dedicated equipment receptacles are required to meet standards. The addition of card-based access control is recommended to control and track access to the space.

Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Electrical infrastructure does not meet minimum requirements per standards.
- Uncontrolled access to space with no identity verification.

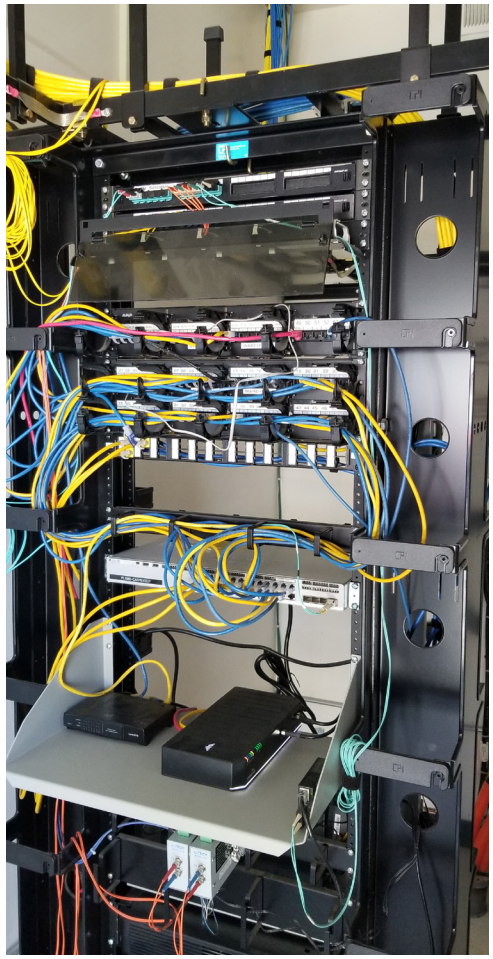
Recommendations:

- Upgrade existing port locations to Category 6A.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide labels for all new cabling and existing cables to remain.
- Provide 12-strand OM4 multi-mode optical fiber backbone from MER in the Admin Building.
- Add power circuits and receptacles as needed.

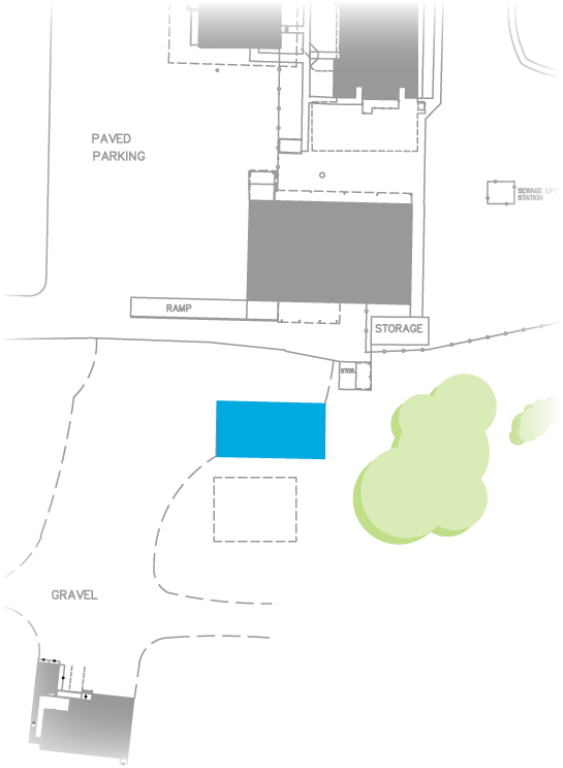
TELECOMMUNICATIONS ROOM – TR-1

Existing Voice Patching.

Existing Fiber Patching.



Existing Telecom Rack.



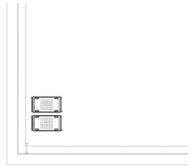
STANDARDS COMPLIANCE

COMPLIANT — NON-COMPLIANT

SCOPE PRIORITIZATION

LOW PRIORITY — HIGH PRIORITY

STORAGE BUILDING (VEHICLE MAINTENANCE)



This building provides high bay garage space for vehicle maintenance.

TELECOMMUNICATIONS ROOM – TR-101

Telecommunications Enclosure TR-101 is two wall mounted enclosures in the southeast corner of the open vehicle bay. Two wall mounted racks support the networking and voice infrastructure. One enclosure contains a rack mount fiber cabinet, copper patch panels, and a network switch. The second enclosure contains the telephone equipment, such as building entrance protection and 110 blocks for patching. Connectivity is provided via 12-strand single-mode and 12-strand OM3 multi-mode optical fiber backbone cables to the MER within the Admin building. Existing horizontal cabling is Category 5e for both data and voice cabling. The enclosures do not have a telecommunications grounding busbar, dedicated cooling, or UPS power.

The existing telecommunications space is not standards compliant. However, due to the small size of the building and the lack of other more suitable spaces, we recommend maintaining the space as the telecommunications room. The existing backbone and horizontal cabling are sufficient to meet current facility needs, however, it does not technically meet current TIA standards for healthcare facilities. To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports should be provided as required to meet standards. Dedicated cooling, cable management, and dedicated equipment receptacles are required to meet standards. The addition of card-based access control is recommended to control and track access to the space.

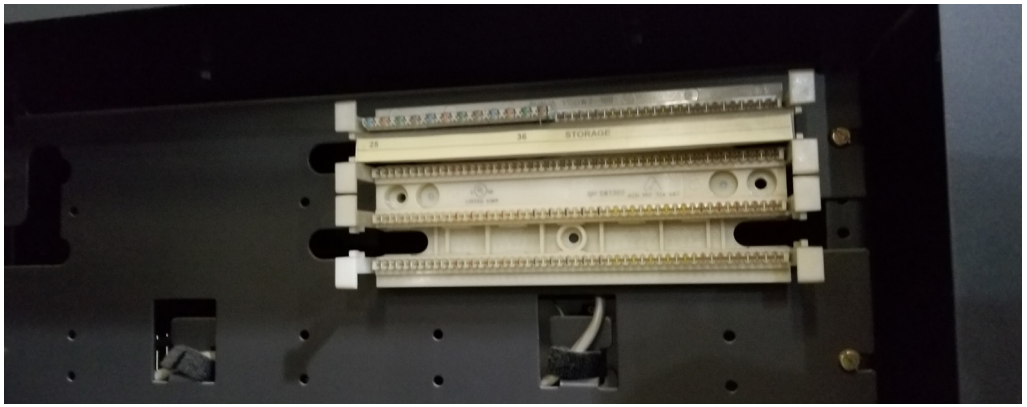
Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal overhead ladder tray for cable support, leading to cables being draped or placed directly on equipment.
- No grounding busbar for the telecommunications equipment.
- No dedicated cooling system to maintain temperature of equipment.
- Electrical infrastructure does not meet minimum requirements per standards.
- Uncontrolled access to space with no identity verification.
- No UPS installed.

Recommendations:

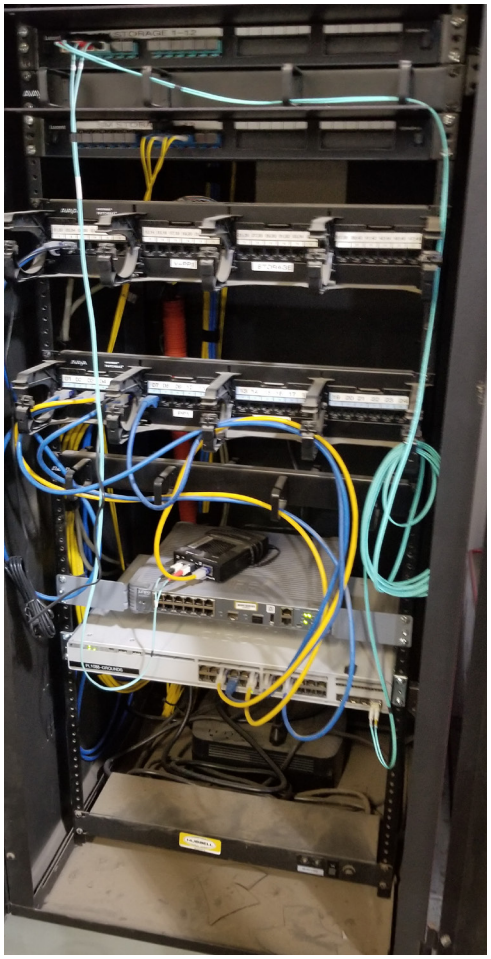
- Upgrade existing port locations to Category 6A.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide labels for all new cabling and existing cables to remain.
- Provide 12-strand OM4 multi-mode optical fiber backbone from MER in the Admin Building.
- Add cable management as needed.
- Add Telecommunications Grounding Busbar.
- Add dedicated cooling system.
- Add power circuits and dedicated receptacles as needed.
- A properly sized UPS should be installed.

TELECOMMUNICATIONS ROOM – TR-101

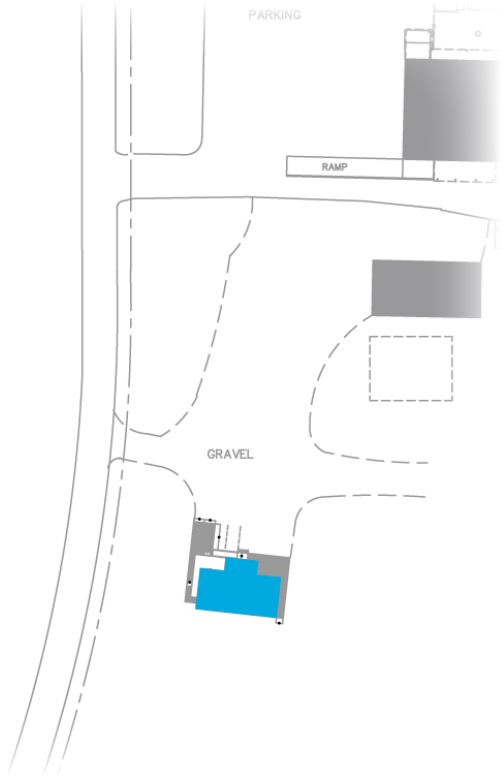


Existing 110-Block.

Existing Building Entrance Protection.



Existing Telecom Cabinet.



STANDARDS COMPLIANCE

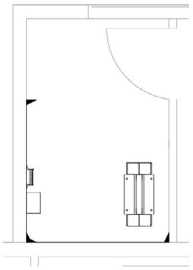
COMPLIANT — NON-COMPLIANT

SCOPE PRIORITIZATION

LOW PRIORITY — HIGH PRIORITY

ROSS HALL

This two-story building provides office space for support services.



TELECOMMUNICATIONS ROOM – TR-102

Telecommunications TR-102 is a dedicated telecommunications room on the lower level of the building. The room has ladder rack around its perimeter to cable support. There is a floor mounted rack containing a rack mount fiber cabinet, copper patch panels, and a network switch. Telephone equipment, such as building entrance protection and 110 blocks for patching are wall mounted opposite the rack. Connectivity is provided via 12-strand single-mode and 12-strand OM3 multi-mode optical fiber backbone cables to the MER within the Admin building. Existing horizontal cabling is Category 5e for both data and voice cabling. The enclosures do not have a telecommunications grounding busbar, dedicated cooling, or UPS power.

The existing backbone and horizontal cabling are sufficient to meet current facility needs, however, it does not technically meet current TIA standards for healthcare facilities. To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports should be provided as required to meet standards. Cable management and dedicated equipment receptacles are required to meet standards. The addition of card-based access control is recommended to control and track access to the space.

Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Electrical infrastructure does not meet minimum requirements per standards.
- Uncontrolled access to space with no identity verification.
- No UPS installed.

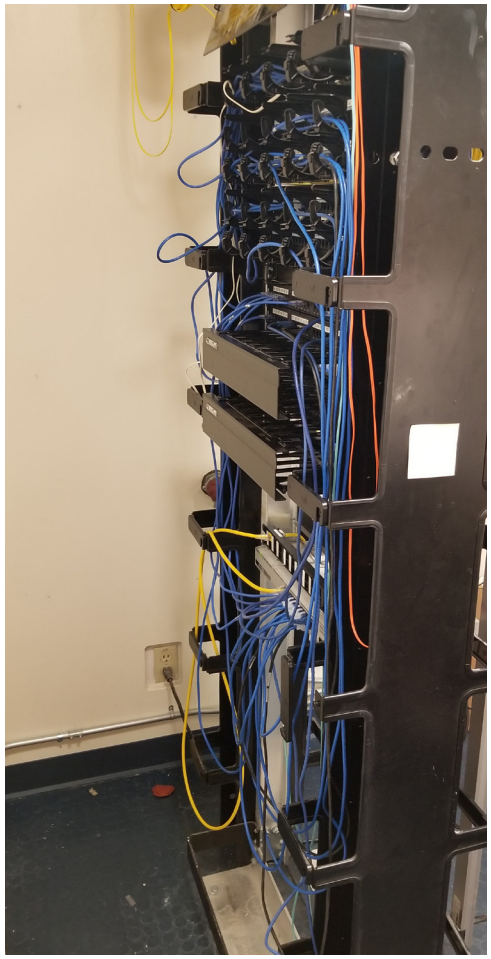
Recommendations:

- Upgrade existing port locations to Category 6A.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide labels for all new cabling and existing cables to remain.
- Provide 12-strand OM4 multi-mode optical fiber backbone from MER in the Admin Building.
- Add power circuits and receptacles as needed.
- A properly sized UPS should be installed.

TELECOMMUNICATIONS ROOM – TR-102

Existing Building Entrance Protection.

Existing Fiber Patching.



Existing Telecom Rack.

APPENDIX A: FULL COST OPINIONS

telecommunications **cost opinion**

HARGIS
1201 third avenue, ste 600
seattle, washington 98101
206.448.3376

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Telecommunications Infrastructure Assessment Recommendations
Pine Lodge

BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

telecommunications summary	subtotal	OH&P	total
Building A - Administration	$ 157,444	$ 23,617	$ 181,061
Building B - Secure Housing Unit	$ 81,482	$ 12,222	$ 93,704
Building C - Kitchen/Dining	$ 108,804	$ 16,321	$ 125,125
Building E - Service Center	$ 106,294	$ 15,944	$ 122,238
Building F - Property/Laundry	$ 346,171	$ 51,926	$ 398,096
Building H - Chapel	$ 83,768	$ 12,565	$ 96,333
Building J - Walker Hall	$ 175,221	$ 26,283	$ 201,505
Building K - Educational	$ 207,065	$ 31,060	$ 238,125
Building M - Medical Building	$ 165,690	$ 24,854	$ 190,544
Building N - Warehouse/Shops	$ 112,302	$ 16,845	$ 129,147
Building S - Storage	$ 80,656	$ 12,098	$ 92,754
Building T - Ross hall	$ 126,632	$ 18,995	$ 145,627
Sub-Total	$ 1,751,529	$ 262,729	$ 2,014,259
General Contractor OH&P **15%**			$ 302,139
Escalation **7%**			$ 162,148
Total			**$ 2,478,546**

EXCLUSIONS

1 - Design contingency

2 - Sales Tax

telecommunications **cost opinion**

Building A - Administration

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 27									
LOW-VOLTAGE SYSTEMS - DIVISIONS 27									
General Provisions (Submittals, Mobilization, Permits)	1	LS	2,318	2,318	4,636	4,636	6,953	1,043	7,997
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	4,354	4,354			4,354	653	5,007
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Telecommunication Room Demolition	1	EA			2,000	2,000	2,000	300	2,300
Demolish Defunct Infrastructure After System Cutover	1	LS			2,000	2,000	2,000	300	2,300
Telecommunications Device - 4-Port	29	EA	1,100	31,900	474	13,737	45,637	6,845	52,482
Telecommunications Device - 4-Port - Existing	18	EA	1,100	19,800	474	8,526	28,326	4,249	32,575
CAT 6A Quickport Connector	232	EA	36	8,388	25	5,800	14,188	2,128	16,316
CAT 6A Quickport Connector - Existing	144	EA	36	5,206	26	3,744	8,950	1,343	10,293
CAT 6A Patch Panel	4	EA	320	1,280	150	600	1,880	282	2,163
Copper 6-port Empty Cassette	32	EA	100	3,200	50	1,600	4,800	720	5,520
Telecom Room - Electrical Improvements	1	EA	4,000	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	29	EA	200	5,800	150	4,350	10,150	1,523	11,673
Subtotal Low-Voltage Systems (Divisions 27)							144,739	21,711	166,450

telecommunications **cost opinion**

Building A - Administration

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138	138	276	276	414	62	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280	280			280	42	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100	100	50	50	150	23	173
Card Reader	1	EA	325	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400	400	700	700	1,100	165	1,265
Programming	1	LS			1,402	1,402	1,402	210	1,612
Engineering	1	LS			701	701	701	105	806
Subtotal Life Safety and Security Systems (Divisions 28)							12,705	1,906	14,611

telecommunications **cost opinion**

Building B - Secure Housing Unit

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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seattle, washington 98101
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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 27									
LOW-VOLTAGE SYSTEMS - DIVISIONS 27									
General Provisions (Submittals, Mobilization, Permits)	1	LS	1,055	1,055	2,110	2,110	3,164	475	3,639
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	2,120	2,120			2,120	318	2,438
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Adaptor Plates - LC ACP	2	EA	150	300	50	100	400	60	460
Rack Mount Fiber Cabinet - 2RU	1	EA	300	300	110	110	410	62	472
Ladder Rack	60	LF	8	450	20	1,200	1,650	248	1,898
2000VA UPS	1	EA	3,000	3,000	110	110	3,110	467	3,577
Demolish Defunct Infrastructure After System Cutover	1	LS			2,000	2,000	2,000	300	2,300
12 Strand Multimode Outside Plant (OSP) OFC	150	LF	1	178	.05	8	186	28	214
Telecommunications Device - 4-Port	11	EA	1,100	12,100	474	5,210	17,310	2,597	19,907
Telecommunications Device - 4-Port - Existing	5	EA	1,100	5,500	474	2,368	7,868	1,180	9,049
CAT 6A Quickport Connector	88	EA	36	3,182	25	2,200	5,382	807	6,189

telecommunications **cost opinion**

Building B - Secure Housing Unit

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
CAT 6A Quickport Connector - Existing	40	EA	36	1,446	26	1,040	2,486	373	2,859
CAT 6A Patch Panel	2	EA	320	640	150	300	940	141	1,081
Copper 6-port Empty Cassette	16	EA	100	1,600	50	800	2,400	360	2,760
Telecom Room - Electrical Improvements	1	EA	4,000	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	11	EA	200	2,200	150	1,650	3,850	578	4,428
Subtotal Low-Voltage Systems (Divisions 27)							68,777	10,317	79,093
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138	138	276	276	414	62	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280	280			280	42	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200	200	200	200	400	60	460

telecommunications **cost opinion**

Building B - Secure Housing Unit

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100	100	50	50	150	23	173
Card Reader	1	EA	325	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400	400	700	700	1,100	165	1,265
Programming	1	LS			1,402	1,402	1,402	210	1,612
Engineering	1	LS			701	701	701	105	806
Subtotal Life Safety and Security Systems (Divisions 28)							12,705	1,906	14,611

telecommunications **cost opinion**

Building C - Kitchen/Dining

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 27									
LOW-VOLTAGE SYSTEMS - DIVISIONS 27									
General Provisions (Submittals, Mobilization, Permits)	1	LS	1,358	1,358	2,716	2,716	4,073	611	4,685
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	3,089	3,089			3,089	463	3,552
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Telecommunications Rooms - HC	1	EA	12,000	12,000	2,500	2,500	14,500	2,175	16,675
Adaptor Plates - LC ACP	2	EA	150	300	50	100	400	60	460
Rack Mount Fiber Cabinet - 2RU	1	EA	300	300	110	110	410	62	472
Ladder Rack	60	LF	8	450	20	1,200	1,650	248	1,898
2000VA UPS	1	EA	3,000	3,000	110	110	3,110	467	3,577
Demolish Defunct Infrastructure After System Cutover	1	LS			2,000	2,000	2,000	300	2,300
12 Strand Multimode Outside Plant (OSP) OFC	350	LF	1	416	.05	18	433	65	498
Telecommunications Device - 4-Port	12	EA	1,100	13,200	474	5,684	18,884	2,833	21,717
Telecommunications Device - 4-Port - Existing	9	EA	1,100	9,900	474	4,263	14,163	2,124	16,288

telecommunications **cost opinion**

Building C - Kitchen/Dining

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

HARGIS
1201 third avenue, ste 600
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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
CAT 6A Quickport Connector	96	EA	36	3,471	25	2,400	5,871	881	6,752
CAT 6A Quickport Connector - Existing	72	EA	36	2,603	26	1,872	4,475	671	5,147
CAT 6A Patch Panel	2	EA	320	640	150	300	940	141	1,081
Copper 6-port Empty Cassette	16	EA	100	1,600	50	800	2,400	360	2,760
Telecom Room - Electrical Improvements	1	EA	4,000	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	12	EA	200	2,400	150	1,800	4,200	630	4,830
Subtotal Low-Voltage Systems (Divisions 27)							96,099	14,415	110,514
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138	138	276	276	414	62	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280	280			280	42	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200	200	200	200	400	60	460

telecommunications **cost opinion**

Building C - Kitchen/Dining

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100	100	50	50	150	23	173
Card Reader	1	EA	325	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400	400	700	700	1,100	165	1,265
Programming	1	LS			1,402	1,402	1,402	210	1,612
Engineering	1	LS			701	701	701	105	806
Subtotal Life Safety and Security Systems (Divisions 28)							12,705	1,906	14,611

telecommunications **cost opinion**

Building E - Service Center

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 27									
LOW-VOLTAGE SYSTEMS - DIVISIONS 27									
General Provisions (Submittals, Mobilization, Permits)	1	LS	1,452	1,452	2,904	2,904	4,356	653	5,010
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	2,866	2,866			2,866	430	3,296
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Adaptor Plates - LC ACP	2	EA	150	300	50	100	400	60	460
Rack Mount Fiber Cabinet - 2RU	1	EA	300	300	110	110	410	62	472
Ladder Rack	30	LF	8	225	20	600	825	124	949
Demolish Defunct Infrastructure After System Cutover	1	LS			2,000	2,000	2,000	300	2,300
12 Strand Multimode Outside Plant (OSP) OFC	950	LF	1	1,129	.05	48	1,176	176	1,353
Telecommunications Device - 4-Port	15	EA	1,100	16,500	474	7,105	23,605	3,541	27,146
Telecommunications Device - 4-Port - Existing	12	EA	1,100	13,200	474	5,684	18,884	2,833	21,717
CAT 6A Quickport Connector	120	EA	36	4,339	25	3,000	7,339	1,101	8,440
CAT 6A Quickport Connector - Existing	96	EA	36	3,471	26	2,496	5,967	895	6,862
CAT 6A Patch Panel	3	EA	320	960	150	450	1,410	212	1,622
Copper 6-port Empty Cassette	24	EA	100	2,400	50	1,200	3,600	540	4,140
Telecom Room - Electrical Improvements	1	EA	4,000	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	15	EA	200	3,000	150	2,250	5,250	788	6,038
Subtotal Low-Voltage Systems (Divisions 27)							93,589	14,038	107,627

telecommunications **cost opinion**

Building E - Service Center

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138	138	276	276	414	62	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280	280			280	42	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100	100	50	50	150	23	173
Card Reader	1	EA	325	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400	400	700	700	1,100	165	1,265
Programming	1	LS			1,402	1,402	1,402	210	1,612
Engineering	1	LS			701	701	701	105	806
Subtotal Life Safety and Security Systems (Divisions 28)							12,705	1,906	14,611

telecommunications **cost opinion**

Building F - Property/Laundry

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 27									
LOW-VOLTAGE SYSTEMS - DIVISIONS 27									
General Provisions (Submittals, Mobilization, Permits)	1	LS	2,267	2,267	4,533	4,533	6,800	1,020	7,820
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	13,397	13,397			13,397	2,010	15,406
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Adaptor Plates - LC ACP	2	EA	150	300	50	100	400	60	460
Rack Mount Fiber Cabinet - 2RU	1	EA	300	300	110	110	410	62	472
Ventilated Rack	30	EA	7,500	225,000	800	24,000	249,000	37,350	286,350
Demolish Defunct Infrastructure After System Cutover	1	LS			2,000	2,000	2,000	300	2,300
12 Strand Multimode Outside Plant (OSP) OFC	1,000	LF	1	1,188	.05	50	1,238	186	1,424
Telecommunications Device - 4-Port	12	EA	1,100	13,200	474	5,684	18,884	2,833	21,717
Telecommunications Device - 4-Port - Existing	6	EA	1,100	6,600	474	2,842	9,442	1,416	10,858
CAT 6A Quickport Connector	96	EA	36	3,471	25	2,400	5,871	881	6,752
CAT 6A Quickport Connector - Existing	48	EA	36	1,735	26	1,248	2,983	448	3,431
CAT 6A Patch Panel	2	EA	320	640	150	300	940	141	1,081
Copper 6-port Empty Cassette	16	EA	100	1,600	50	800	2,400	360	2,760
Telecom Room - Electrical Improvements	1	EA	4,000	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	12	EA	200	2,400	150	1,800	4,200	630	4,830
Subtotal Low-Voltage Systems (Divisions 27)							333,466	50,020	383,486

telecommunications **cost opinion**

Building F - Property/Laundry

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138	138	276	276	414	62	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280	280			280	42	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100	100	50	50	150	23	173
Card Reader	1	EA	325	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400	400	700	700	1,100	165	1,265
Programming	1	LS			1,402	1,402	1,402	210	1,612
Engineering	1	LS			701	701	701	105	806
Subtotal Life Safety and Security Systems (Divisions 28)							12,705	1,906	14,611

telecommunications **cost opinion**

Building H - Chapel

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 27									
LOW-VOLTAGE SYSTEMS - DIVISIONS 27									
General Provisions (Submittals, Mobilization, Permits)	1	LS	1,035	1,035	2,069	2,069	3,104	466	3,569
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	2,251	2,251			2,251	338	2,588
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Telecommunications Rooms - HC	1	EA	12,000	12,000	2,500	2,500	14,500	2,175	16,675
Adaptor Plates - LC ACP	2	EA	150	300	50	100	400	60	460
Rack Mount Fiber Cabinet - 2RU	1	EA	300	300	110	110	410	62	472
Ladder Rack	60	LF	8	450	20	1,200	1,650	248	1,898
2000VA UPS	1	EA	3,000	3,000	110	110	3,110	467	3,577
Telecommunication Room Demolition	1	EA			2,000	2,000	2,000	300	2,300
Demolish Defunct Infrastructure After System Cutover	1	LS			2,000	2,000	2,000	300	2,300
12 Strand Multimode Outside Plant (OSP) OFC	550	LF	1	653	.05	28	681	102	783
Telecommunications Device - 4-Port	9	EA	1,100	9,900	474	4,263	14,163	2,124	16,288

telecommunications **cost opinion**

Building H - Chapel

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
Telecommunications Device - 4-Port - Existing	1	EA	1,100	1,100	474	474	1,574	236	1,810
CAT 6A Quickport Connector	72	EA	36	2,603	25	1,800	4,403	660	5,064
CAT 6A Quickport Connector - Existing	8	EA	36	289	26	208	497	75	572
CAT 6A Patch Panel	1	EA	320	320	150	150	470	71	541
Copper 6-port Empty Cassette	8	EA	100	800	50	400	1,200	180	1,380
Telecom Room - Electrical Improvements	1	EA	4,000	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	9	EA	200	1,800	150	1,350	3,150	473	3,623
Subtotal Low-Voltage Systems (Divisions 27)							71,063	10,659	81,722
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138	138	276	276	414	62	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280	280			280	42	322

telecommunications **cost opinion**

Building H - Chapel

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
Raceway, Cabling Supports and Outlet Boxes	1	EA	200	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100	100	50	50	150	23	173
Card Reader	1	EA	325	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400	400	700	700	1,100	165	1,265
Programming	1	LS			1,402	1,402	1,402	210	1,612
Engineering	1	LS			701	701	701	105	806
Subtotal Life Safety and Security Systems (Divisions 28)							12,705	1,906	14,611

telecommunications **cost opinion**

Building J - Walker Hall

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 27									
LOW-VOLTAGE SYSTEMS - DIVISIONS 27									
General Provisions (Submittals, Mobilization, Permits)	1	LS	2,478	2,478	4,956	4,956	7,433	1,115	8,548
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	5,025	5,025			5,025	754	5,779
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Adaptor Plates - LC ACP	2	EA	150	300	50	100	400	60	460
Rack Mount Fiber Cabinet - 2RU	1	EA	300	300	110	110	410	62	472
2000VA UPS	1	EA	3,000	3,000	110	110	3,110	467	3,577
Demolish Defunct Infrastructure After System Cutover	1	LS			2,000	2,000	2,000	300	2,300
12 Strand Multimode Outside Plant (OSP) OFC	800	LF	1	950	.05	40	990	149	1,139
Telecommunications Device - 4-Port	40	EA	1,100	44,000	474	18,947	62,947	9,442	72,389
Telecommunications Device - 4-Port - Existing	11	EA	1,100	12,100	474	5,210	17,310	2,597	19,907
CAT 6A Quickport Connector	320	EA	36	11,570	25	8,000	19,570	2,935	22,505
CAT 6A Quickport Connector - Existing	88	EA	36	3,182	26	2,288	5,470	820	6,290
CAT 6A Patch Panel	5	EA	320	1,601	150	750	2,351	353	2,703
Copper 6-port Empty Cassette	40	EA	100	4,000	50	2,000	6,000	900	6,900
Telecom Room - Electrical Improvements	1	EA	4,000	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	40	EA	200	8,000	150	6,000	14,000	2,100	16,100
Subtotal Low-Voltage Systems (Divisions 27)							162,516	24,377	186,894

telecommunications **cost opinion**

Building J - Walker Hall

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138	138	276	276	414	62	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280	280			280	42	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100	100	50	50	150	23	173
Card Reader	1	EA	325	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400	400	700	700	1,100	165	1,265
Programming	1	LS			1,402	1,402	1,402	210	1,612
Engineering	1	LS			701	701	701	105	806
Subtotal Life Safety and Security Systems (Divisions 28)							12,705	1,906	14,611

telecommunications **cost opinion**

Building K - Educational

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 27									
LOW-VOLTAGE SYSTEMS - DIVISIONS 27									
General Provisions (Submittals, Mobilization, Permits)	1	LS	2,960	2,960	5,921	5,921	8,881	1,332	10,213
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	6,013	6,013			6,013	902	6,915
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Adaptor Plates - LC ACP	2	EA	150	300	50	100	400	60	460
Rack Mount Fiber Cabinet - 2RU	1	EA	300	300	110	110	410	62	472
Ladder Rack	20	LF	8	150	20	400	550	83	633
2000VA UPS	1	EA	3,000	3,000	110	110	3,110	467	3,577
Demolish Defunct Infrastructure After System Cutover	1	LS			2,000	2,000	2,000	300	2,300
12 Strand Multimode Outside Plant (OSP) OFC	1,000	LF	1	1,188	.05	50	1,238	186	1,424
Telecommunications Device - 4-Port	34	EA	1,100	37,400	474	16,105	53,505	8,026	61,531
Telecommunications Device - 4-Port - Existing	31	EA	1,100	34,100	474	14,684	48,784	7,318	56,101
CAT 6A Quickport Connector	272	EA	36	9,834	25	6,800	16,634	2,495	19,130
CAT 6A Quickport Connector - Existing	248	EA	36	8,967	26	6,448	15,415	2,312	17,727
CAT 6A Patch Panel	6	EA	320	1,921	150	900	2,821	423	3,244
Copper 6-port Empty Cassette	48	EA	100	4,800	50	2,400	7,200	1,080	8,280
Telecom Room - Electrical Improvements	1	EA	4,000	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	34	EA	200	6,800	150	5,100	11,900	1,785	13,685

telecommunications **cost opinion**

Building K - Educational

Telecommunications Infrastructure Assessment Recommendations

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
Subtotal Low-Voltage Systems (Divisions 27)							194,361	29,154	223,515
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138	138	276	276	414	62	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280	280			280	42	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100	100	50	50	150	23	173
Card Reader	1	EA	325	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400	400	700	700	1,100	165	1,265
Programming	1	LS			1,402	1,402	1,402	210	1,612
Engineering	1	LS			701	701	701	105	806
Subtotal Life Safety and Security Systems (Divisions 28)							12,705	1,906	14,611

telecommunications **cost opinion**

Building M - Medical Building

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

HARGIS
1201 third avenue, ste 600
seattle, washington 98101
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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 27									
LOW-VOLTAGE SYSTEMS - DIVISIONS 27									
General Provisions (Submittals, Mobilization, Permits)	1	LS	2,373	2,373	4,746	4,746	7,119	1,068	8,187
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	4,686	4,686			4,686	703	5,389
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Adaptor Plates - LC ACP	2	EA	150	300	50	100	400	60	460
Rack Mount Fiber Cabinet - 2RU	1	EA	300	300	110	110	410	62	472
Demolish Defunct Infrastructure After System Cutover	1	LS			2,000	2,000	2,000	300	2,300
12 Strand Multimode Outside Plant (OSP) OFC	300	LF	1	356	.05	15	371	56	427
Telecommunications Device - 4-Port	31	EA	1,100	34,100	474	14,684	48,784	7,318	56,101
Telecommunications Device - 4-Port - Existing	19	EA	1,100	20,900	474	9,000	29,900	4,485	34,385
CAT 6A Quickport Connector	248	EA	36	8,967	25	6,200	15,167	2,275	17,442
CAT 6A Quickport Connector - Existing	152	EA	36	5,496	26	3,952	9,448	1,417	10,865
CAT 6A Patch Panel	5	EA	320	1,601	150	750	2,351	353	2,703
Copper 6-port Empty Cassette	40	EA	100	4,000	50	2,000	6,000	900	6,900
Telecom Room - Electrical Improvements	1	EA	4,000	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	31	EA	200	6,200	150	4,650	10,850	1,628	12,478
Subtotal Low-Voltage Systems (Divisions 27)							152,985	22,948	175,933

telecommunications **cost opinion**

Building M - Medical Building

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description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138	138	276	276	414	62	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280	280			280	42	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100	100	50	50	150	23	173
Card Reader	1	EA	325	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400	400	700	700	1,100	165	1,265
Programming	1	LS			1,402	1,402	1,402	210	1,612
Engineering	1	LS			701	701	701	105	806
Subtotal Life Safety and Security Systems (Divisions 28)							12,705	1,906	14,611

telecommunications **cost opinion**

Building N - Warehouse/Shops

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 27									
LOW-VOLTAGE SYSTEMS - DIVISIONS 27									
General Provisions (Submittals, Mobilization, Permits)	1	LS	1,544	1,544	3,088	3,088	4,632	695	5,327
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	3,052	3,052			3,052	458	3,509
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Adaptor Plates - LC ACP	2	EA	150	300	50	100	400	60	460
Rack Mount Fiber Cabinet - 2RU	1	EA	300	300	110	110	410	62	472
Demolish Defunct Infrastructure After System Cutover	1	LS			2,000	2,000	2,000	300	2,300
12 Strand Multimode Outside Plant (OSP) OFC	250	LF	1	297	.05	13	310	46	356
Telecommunications Device - 4-Port	18	EA	1,100	19,800	474	8,526	28,326	4,249	32,575
Telecommunications Device - 4-Port - Existing	12	EA	1,100	13,200	474	5,684	18,884	2,833	21,717
CAT 6A Quickport Connector	144	EA	36	5,206	25	3,600	8,806	1,321	10,127
CAT 6A Quickport Connector - Existing	96	EA	36	3,471	26	2,496	5,967	895	6,862
CAT 6A Patch Panel	3	EA	320	960	150	450	1,410	212	1,622
Copper 6-port Empty Cassette	24	EA	100	2,400	50	1,200	3,600	540	4,140
Telecom Room - Electrical Improvements	1	EA	4,000	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	18	EA	200	3,600	150	2,700	6,300	945	7,245
Subtotal Low-Voltage Systems (Divisions 27)							99,597	14,940	114,537

telecommunications **cost opinion**

Building N - Warehouse/Shops

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138	138	276	276	414	62	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280	280			280	42	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100	100	50	50	150	23	173
Card Reader	1	EA	325	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400	400	700	700	1,100	165	1,265
Programming	1	LS			1,402	1,402	1,402	210	1,612
Engineering	1	LS			701	701	701	105	806
Subtotal Life Safety and Security Systems (Divisions 28)							12,705	1,906	14,611

telecommunications **cost opinion**

Building S - Storage

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 27									
LOW-VOLTAGE SYSTEMS - DIVISIONS 27									
General Provisions (Submittals, Mobilization, Permits)	1	LS	920	920	1,841	1,841	2,761	414	3,175
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	2,228	2,228			2,228	334	2,562
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Telecommunications Rooms - HC	1	EA	12,000	12,000	2,500	2,500	14,500	2,175	16,675
Adaptor Plates - LC ACP	2	EA	150	300	50	100	400	60	460
Rack Mount Fiber Cabinet - 2RU	1	EA	300	300	110	110	410	62	472
Ladder Rack	60	LF	8	450	20	1,200	1,650	248	1,898
2000VA UPS	1	EA	3,000	3,000	110	110	3,110	467	3,577
Demolish Defunct Infrastructure After System Cutover	1	LS			2,000	2,000	2,000	300	2,300
12 Strand Multimode Outside Plant (OSP) OFC	500	LF	1	594	.05	25	619	93	712
Telecommunications Device - 4-Port	7	EA	1,100	7,700	474	3,316	11,016	1,652	12,668
Telecommunications Device - 4-Port - Existing	3	EA	1,100	3,300	474	1,421	4,721	708	5,429
CAT 6A Quickport Connector	56	EA	36	2,025	25	1,400	3,425	514	3,938
CAT 6A Quickport Connector - Existing	24	EA	36	868	26	624	1,492	224	1,716
CAT 6A Patch Panel	1	EA	320	320	150	150	470	71	541
Copper 6-port Empty Cassette	8	EA	100	800	50	400	1,200	180	1,380
Telecom Room - Electrical Improvements	1	EA	4,000	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	7	EA	200	1,400	150	1,050	2,450	368	2,818

telecommunications **cost opinion**

Building S - Storage

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
Subtotal Low-Voltage Systems (Divisions 27)							67,951	10,193	78,144
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138	138	276	276	414	62	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280	280			280	42	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100	100	50	50	150	23	173
Card Reader	1	EA	325	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400	400	700	700	1,100	165	1,265
Programming	1	LS			1,402	1,402	1,402	210	1,612
Engineering	1	LS			701	701	701	105	806
Subtotal Life Safety and Security Systems (Divisions 28)							12,705	1,906	14,611

telecommunications **cost opinion**

Building T - Ross hall

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 14, 2024

JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 27									
LOW-VOLTAGE SYSTEMS - DIVISIONS 27									
General Provisions (Submittals, Mobilization, Permits)	1	LS	1,707	1,707	3,414	3,414	5,120	768	5,888
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	3,556	3,556			3,556	533	4,089
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Adaptor Plates - LC ACP	2	EA	150	300	50	100	400	60	460
Rack Mount Fiber Cabinet - 2RU	1	EA	300	300	110	110	410	62	472
2000VA UPS	1	EA	3,000	3,000	110	110	3,110	467	3,577
Demolish Defunct Infrastructure After System Cutover	1	LS			2,000	2,000	2,000	300	2,300
12 Strand Multimode Outside Plant (OSP) OFC	700	LF	1	832	.05	35	867	130	997
Telecommunications Device - 4-Port	16	EA	1,100	17,600	474	7,579	25,179	3,777	28,956
Telecommunications Device - 4-Port - Existing	19	EA	1,100	20,900	474	9,000	29,900	4,485	34,385
CAT 6A Quickport Connector	128	EA	36	4,628	25	3,200	7,828	1,174	9,002
CAT 6A Quickport Connector - Existing	152	EA	36	5,496	26	3,952	9,448	1,417	10,865
CAT 6A Patch Panel	3	EA	320	960	150	450	1,410	212	1,622
Copper 6-port Empty Cassette	24	EA	100	2,400	50	1,200	3,600	540	4,140
Telecom Room - Electrical Improvements	1	EA	4,000	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	16	EA	200	3,200	150	2,400	5,600	840	6,440
Subtotal Low-Voltage Systems (Divisions 27)							113,927	17,089	131,016

telecommunications **cost opinion**

Building T - Ross hall

Telecommunications Infrastructure Assessment Recommendations

Pine Lodge

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JOB NUMBER 24046 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 15%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138	138	276	276	414	62	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280	280			280	42	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100	100	50	50	150	23	173
Card Reader	1	EA	325	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400	400	700	700	1,100	165	1,265
Programming	1	LS			1,402	1,402	1,402	210	1,612
Engineering	1	LS			701	701	701	105	806
Subtotal Life Safety and Security Systems (Divisions 28)							12,705	1,906	14,611