HARGIS TELECOMMUNICATIONS ASSESSMENT

DSHS

MAPLE LANE SCHOOL

WA STATE PROJECT NUMBER: 2024-429 A (1)

EXECUTIVE SUMMARY

OVERVIEW

Maple Lane School, established in 1914, is Washington state's sole state-operated and funded psychiatric hospital for children and youth that cannot be met in their communities. The facility is in Grand Mound, WA, south of Olympia. It is operated by the Behavioral Health Administration (BHA) of the Department of Social and Health Services (DSHS). The facility provides a variety of different mental health care. The campus has been operated by WA DOC but is transitioning over to DSHS. The new Oak Unit was built to be a community based mental health care facility, providing secure therapeutic treatment. The Columbia Unit was just remodeled, its mission is to treat people in need of inpatient psychiatric care who have been found not guilty by reason of insanity and have made substantial progress in their treatment. Columbia Unit helps provide a therapeutic pathway for residents to further progress in their treatment.

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

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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.

The existing campus telecommunications cabling backbone infrastructure includes inter-building optical fiber cabling and twisted-pair copper backbone cabling installed between the Administration Building, the Multi-purpose Building, and other buildings on campus. In most areas, the backbone cabling is antiquated and is not able to support the deployment of new technologies, nor does it comply with current industry standards. The twisted-pair copper backbone is rated for traditional telephony service. The existing backbone cabling does not meet current industry standards and needs to be replaced with new standards compliant backbone cabling.

The existing horizontal cabling within buildings includes unshielded twisted-pair copper cabling to provide connectivity to computers, telephones, printers, and other devices. Like the backbone cabling, the horizontal cabling has been installed over time and the condition of the cabling varies. The horizontal cabling is a blend of non-category rated cabling, Category 3 cabling and Category 5e cabling, which does not meet current industry infrastructure standards.

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 OM1 62.5-micron multi-mode optical fiber cable. Improving the IP backbone connectivity will be a fundamental component to creating an environment that will permit CSTC and DSHS to identify, adapt, and implement new technologies that contribute to safety and operational improvements.

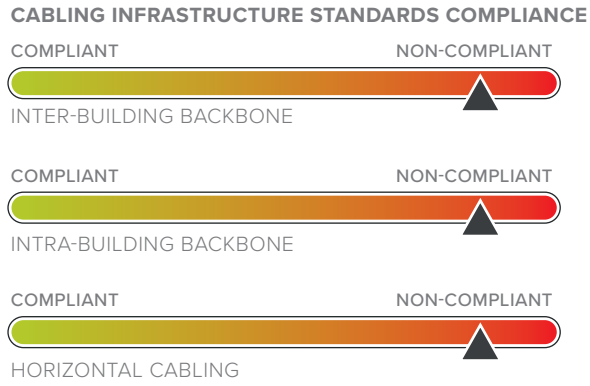
Existing horizontal cabling is not compliant with current TIA standards for this facility type. Upgrading category cabling requires a replacement of the complete channel to include horizontal cabling, patch cords, patch panels, and work area outlets. At Maple Lane, this upgrade also requires installation 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 space 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 Maple Lane and DSHS 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

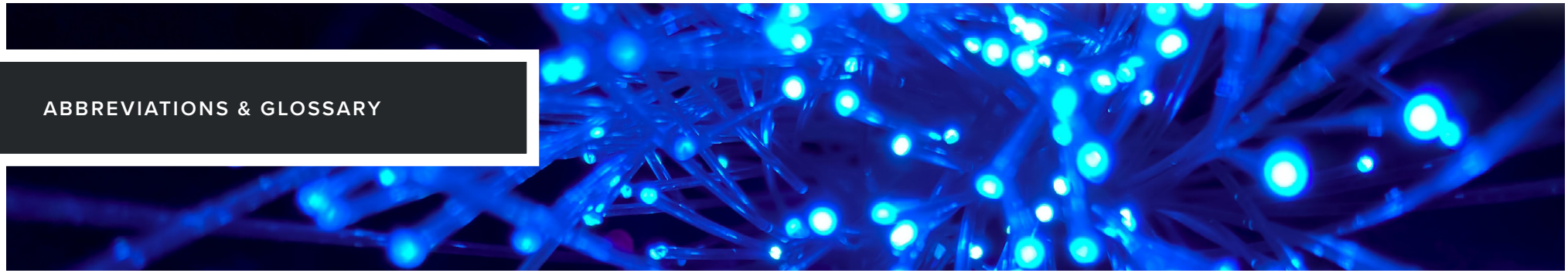
Review, assess and evaluate systems in each building

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 9, 10, 11, 15, 16, 18, 29, 30, 31, 32, 33, 37, 38, 39, 39A, 40, & 40A. - 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 a dedicated cooling unit for TRs. - Expand existing 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.)	$1,332,000
INSTALL BACKBONE OFC TO NEW TELECOM SPACES			
2	N/A	» Pull 12 st OS2 and 12 st OM4 OFC from MER in Building 10 to each telecom room in Buildings 1, 9, 11, 15, 16, 18, 29, 30, 31, 32, 33, 37, 38, 39, 39A, 40, & 40A. - Terminate OFC Cabling if RMFC is installed.	$1,852,000
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.	$2,537,000
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.	$850,000
DEMOLISH DEFUNCT INFRASTRUCTURE			
6	1-5	» Demolish OSP cable. - Demolish OM1 Multi-mode OSP OFC to from Building 10 to Buildings 1, 9, 10, 11, 15, 16, 18, 29, 30, 31, 32, 33, 37, 38, 39, 40, & 40A - Demolish OM1 Multi-mode OSP OFC to from Building 40A to Buildings 39, 39A, & 40 - Demolish OM1 Multi-mode OSP OFC to from Building 15 to Buildings 11 & 37 - Demolish Copper twisted pair OSP Backbone cabling between Building 10 and Buildings 39, 40, & 49A - Demolish Copper twisted pair OSP Backbone cabling between Building 11 and Buildings 1, 7, 9, 10, 15, 18, 29, 30, 31, & 32 - Demolish Copper twisted pair OSP Backbone cabling between Building 15 and Building 37 » Demolish Building 15 backbone cabling - Demolish OM1 Multi-mode OFC between TR-114 & TR-145 - Demolish Copper twisted pair backbone between TR-114 & TR-145 » Demolish Building 39 backbone cabling - Demolish OM1 Multi-mode OFC between TR-143 & TR-151 - Demolish Copper twisted pair backbone between TR-143 & TR-151 » Demolish Defunct telecommmunications rooms. - Remove any salvageable equipment from TR's. - Remove the remaining equipment and dispose of it.	$92,000

BACKBONE CABLING

Service Provider Connections

Service provider connections are provided through Lumen. The campus is served by a 24-strand SM OFC from Lumen for internet service. Staff indicated there was a backup internet service in place but could not recall the provider at the time of the survey.

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/CAMPUS BACKBONE CABLING

The existing communications infrastructure providing connectivity across the Maple Lane School campus is a mix of 62.5-micron OM1 multi-mode outside plant optical fiber cable, 50-micron OM3 multi-mode outside plant optical fiber cable, single-mode outside plant optical fiber cable, and twisted-pair copper cable for voice applications.

The fiber has been installed and expanded over time as the facility has changed agencies. The initial telecommunications backbone infrastructure was the twisted-pair copper backbone cabling installed for the phones. OM1 multi-mode optical fiber backbone was added later, followed by the OM3 multi-mode and single-mode optical fiber backbones. The OM3 multi-mode optical fiber cable while sufficient to meet the bandwidth and data speed needs of the campus, does not comply with current TIA standards for health care facilities.

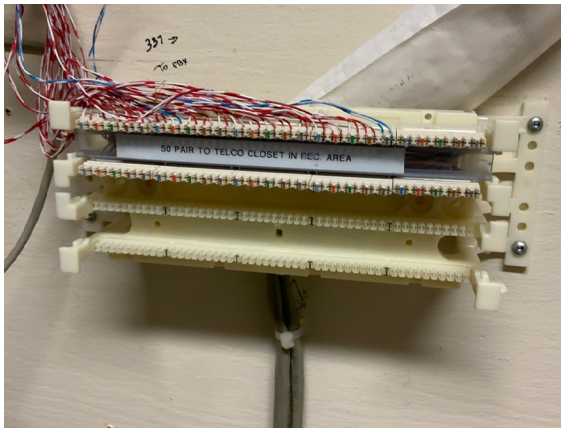
For the twisted-pair copper backbone infrastructure, the demarcation point is telecommunications room TR-105 in the Multi-Purpose Building. The main phone service from the service provider enters this room, terminates on building entrance protection, and is patched to campus backbone cabling providing phone service to other buildings on campus.

The Administration Building is the Main Equipment Room and optical fiber hub of the campus. It is connected to other campus buildings through multi-mode and single-mode optical fiber backbone connections. Most of the connections consist of OM1 multi-mode optical fiber. When the Dept. of Corrections built their new centralized pharmacy on campus, it was connected to the admin building through an OS2 single-mode optical fiber backbone. When DSHS took over the Cascade and Columbia units and built the portable buildings, OM3 multi-mode optical fiber backbone was added to connect Cascade, Columbia, each portable, and Administration. Single-mode fiber from the Administration Building to Baker and Chelan has been added to support the detention systems in those units.

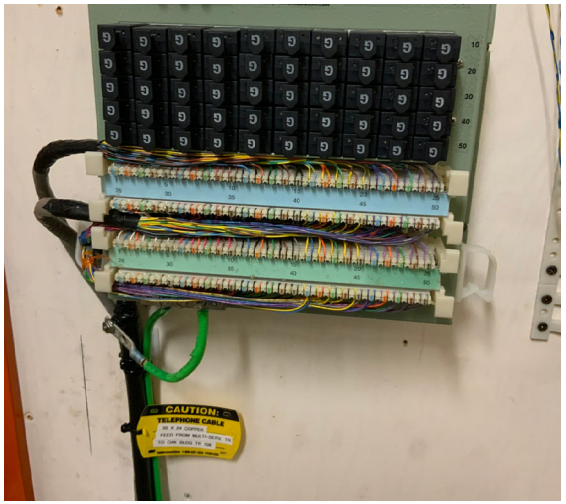
The current OM1 fiber backbone is extremely limited in bandwidth and data speeds. OM1 fiber is obsolete, is not readily available through distribution, and is not being manufactured in great quantity. TIA standards for healthcare facilities also dictate the use of single-mode optical fiber or a minimum of OM4 rated multi-mode fiber. To allow future network expansion, technology growth, and to meet current standards, it is recommended that the existing OM1 optical fiber backbone be replaced with an optical fiber backbone utilizing 12-strands of OS2 single-mode outside plant optical fiber cable and 12-strands of OM4 multi-mode outside plant optical fiber cable supporting each building. The existing OM1 optical fiber backbone cabling should be demolished.

All Buildings are served by Category 3 twisted-pair copper cabling for voice applications. Due to the limited backbone cabling going to each Cottage, it is recommended that the existing Category 3 twisted-pair copper backbone be replaced and/or augmented with industry standard compliant backbone cabling consisting of a hybrid of single-mode and multi-mode optical fiber cabling.

Existing Interbuilding Fiber Backbone.



Existing Voice Patching.



Existing Copper Backbone.

INTRA-BUILDING BACKBONE CABLING

Due to the sizes of the Maple Lane School buildings, there is limited intra-building backbone cabling on the campus. Columbia Unit was just remodeled, and as part of the remodel, a new telecommunications room was created. An OM3 multi-mode optical fiber was provided from the new telecommunications room to the existing telecommunications room to extend the DSHS network and support the new space. The School/Gym Building has an OM1 multi-mode backbone optical fiber cable from TR-114 to TR-145. The Baker and Chelan telecom rooms have a single-mode optical fiber backbone connecting them.

Category 3 voice OSP backbone cabling in installed in several buildings. There is a 25-pair twisted-pair copper backbone cable between TR-114 and TR-145 in the School/Gym Building, and between the old telecommunications room and the new. The voice network should be collapsed to a single converged IP based network, and the existing Category 3 cabling should be demolished to align with current standards.

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 OS2 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 Interbuilding Backbone Cabling.

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 Category 3 Cabling.

Existing Telecom Wall Plate.

Existing Furniture Feed.

VOICE HORIZONTAL CABLING

Upon review of the voice infrastructure, it was found to be inadequate to serve the current and future needs of Maple Lane School. The current phone system utilizes Category 3 cabling, patched at multiple points to provide phone service to the user. 66 and 110 blocks are used to patch the cable. 66 and 110 blocks are types of cable termination blocks used to interconnect runs of on-premises wiring in a structured cabling system. The service demarks in the Multi-Purpose Building and is patched to backbone cables that distribute service across the campus. The twisted-pair copper cable patches on building entrance protectors, then patches to 66 blocks, then to the workstation cabling.

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. 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 horizontal network infrastructure is comprised of a mix of Category 5, 5e, 6, and 6A cabling. Category 5 cabling is limited to 100 Mbps and is no longer recognized by the standards bodies as a viable infrastructure. The existing patch panels, connectors, and patch panels meet different standards, from Category 5 to 6A, varying by building. Most of the existing buildings have Category 5 and 5e infrastructure, with the recently constructed Oak Building having Category 6A infrastructure.

The existing infrastructure is not adequate to meet the current and future needs of Maple Lane School. The Category 5, 5e, and 6 cabling is not in compliance with TIA standards for healthcare infrastructure. It is recommended that the existing cabling infrastructure be replaced with a new Category 6A cabling infrastructure.

Meeting TIA-1179 standards will require the entire channel to be Category 6A certified. Meeting this requirement will require all new patch panels, modular jacks, and wall outlets comprising a replacement of the entire infrastructure. Existing Category 5, 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

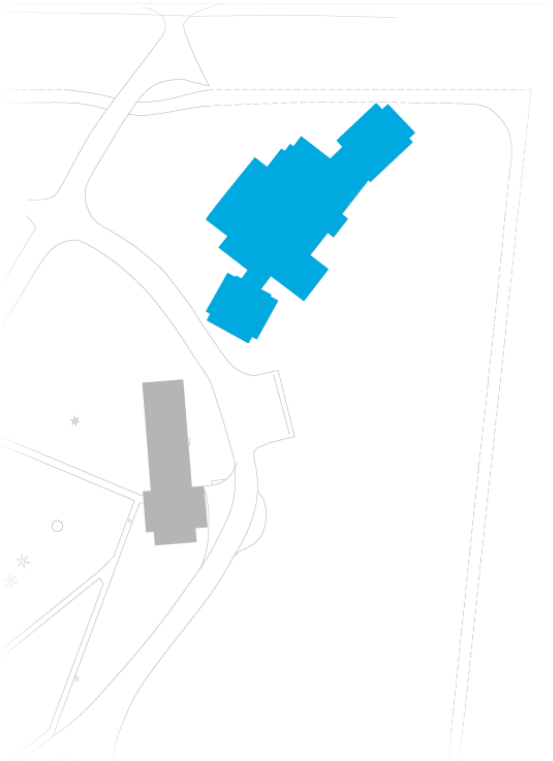
EVALUATION CRITERIA FOR TELECOMMUNICATIONS ROOMS		
Room/Space	»	Quantity, Location, and Size of Telecommunications Room.
	»	Available space to install and terminate new cabling and rack space to mount new equipment
	»	Adequate working clearances to access and maintain additional equipment and cabling
	»	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

The existing telecommunications spaces are not compliant with current standards. Currently, there is not a telecommunications space on every floor as standards dictate. The existing spaces do not have an environmental control system to maintain required temperature and humidity. Inconsistent grounding was observed during the walkthrough, increasing the risk of damage to equipment from transient voltages.

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

OAK BUILDING

Oak Building is a treatment building. It is located outside the secure perimeter fence.

TELECOMMUNICATIONS ROOM – TR-A164

Telecommunications Room TR-A164 serves the Oak Building. It provides a dedicated telecommunications space. The building is served by a 24-strand OM3 multi-mode optical fiber cable and a 50-pair twisted-pair Category 3 copper backbone cable. While the OM3 multi-mode optical fiber cable meets current required bandwidth and data speeds required by the current network load, it technically does not meet current TIA standards for health care facilities. The recommendation to upgrade to OM4 is based purely on standards compliance. There are four floor mounted racks containing a rack mount fiber cabinet, copper patch panels, cable management, network switches, and a UPS. Existing horizontal cabling is Category 6A for data, and Category 3 for voice applications. 110 blocks and building entrance protection are located on the wall. There are also wall mounted access control panels. A telecommunications grounding busbar is installed and all racks, ladder rack, and building components are bonded. Dedicated cooling provides temperature and humidity control. Electrical infrastructure includes convenience and dedicated equipment receptacles.

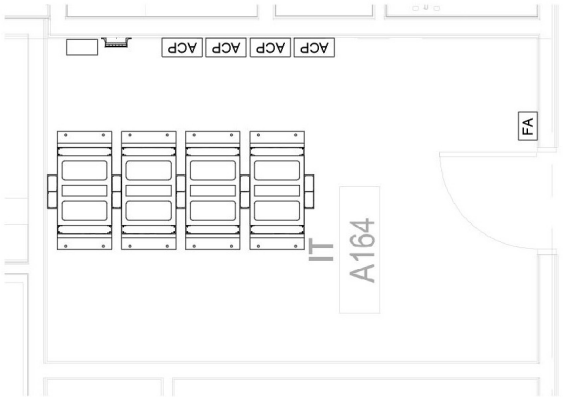
To meet industry standards, it is recommended to upgrade the existing backbone cabling.

Deficiencies:

» Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.

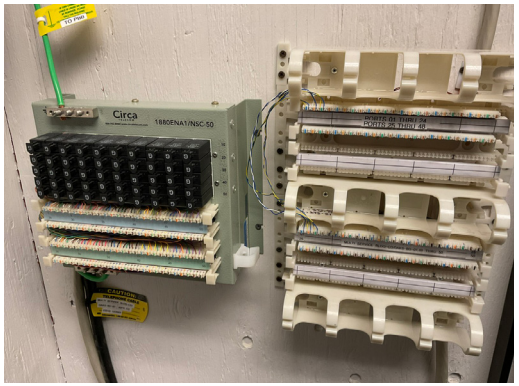
Recommendations:

» Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.



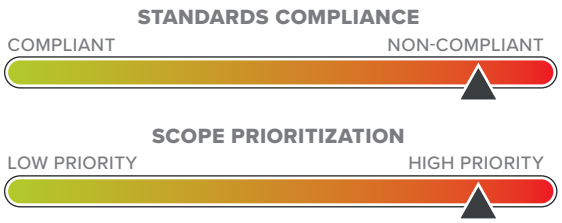
TELECOMMUNICATIONS ROOM – TR-A164

Existing Data Patching.



Existing Voice Patching.

Existing Patch Panel.



LAUREL

Laurel Building is a living unit. It was unoccupied during the survey and was being used for storage. A remodel is likely needed for re-occupation.

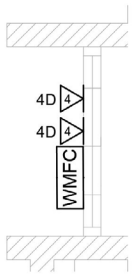
TELECOMMUNICATIONS ROOM – TR-108

The telecommunications space TR-108 serves the Laurel Building. It is a space on the wall in Security Office 108. There is no dedicated telecommunications space. The building is served by a 12-strand OM1 multi-mode optical fiber cable and a 25-pair twisted-pair Category 3 copper backbone cable. There are no racks in the space. There is a wall mount fiber cabinet and 66 blocks for backbone termination. The existing horizontal cabling is Category 5 for data and Category 3 for voice applications. No telecommunications grounding busbar is present, there is no dedicated cooling system for temperature and humidity control, and no sufficient electrical infrastructure.

To meet industry standards, it is recommended to provide a new dedicated telecommunications room. The new telecommunications room should be provided with standards compliant backbone and horizontal cabling. Category 6A data ports meeting port density specified in standards are recommended. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. Dedicated cooling, ladder rack, 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:

- No telecommunications room.
- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.|



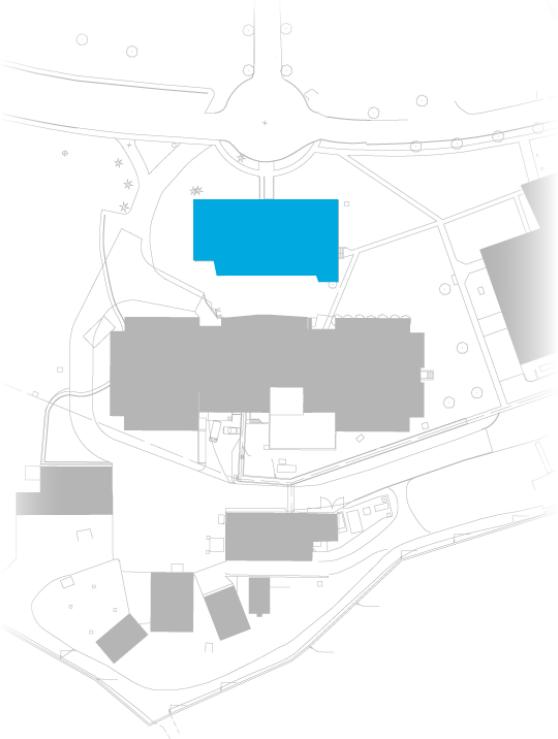
Recommendations:

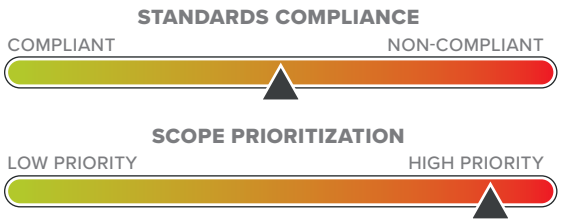
- Provide a dedicated telecommunications room.
- Upgrade existing port locations to Category 6A.
- Provide labels for all new cabling and existing cables to remain.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Add ladder tray and cable management as needed.
- Add Telecommunications Grounding Busbar.
- Add ductless split-system cooling unit.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.

TELECOMMUNICATIONS ROOM – TR-108

Existing Fiber Patching.

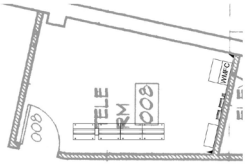
Existing Voice Patching.





ADMINISTRATION BUILDING

The Administration Building is the primary office building for the facility. The building was undergoing some renovations during the survey. The Administration Building is the main fiber hub for the campus.



MAIN EQUIPMENT ROOM – MER-008

Main Equipment Room MER-008 is in the basement of the Administration Building. It provides a dedicated telecommunications space. The building is served by OM1 multi-mode, OM3 multi-mode, and OS2 single-mode optical fiber cable connecting all buildings on campus. Voice service to the building is provided by a 50-pair twisted-pair Category 3 copper backbone cable. There are four floor mounted racks containing rack mount fiber cabinets, copper patch panels, cable management, network switches, and a UPS. Existing horizontal cabling is Category 5 for data, and Category 3 for voice applications. 110 and 66 blocks and building entrance protection are located on the wall. There are also rack mounted access control panels. No telecommunications grounding busbar was observed. No dedicated cooling was observed. Electrical infrastructure is not standards compliant.

To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports are required to meet standards. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. Dedicated cooling, ladder rack, 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.

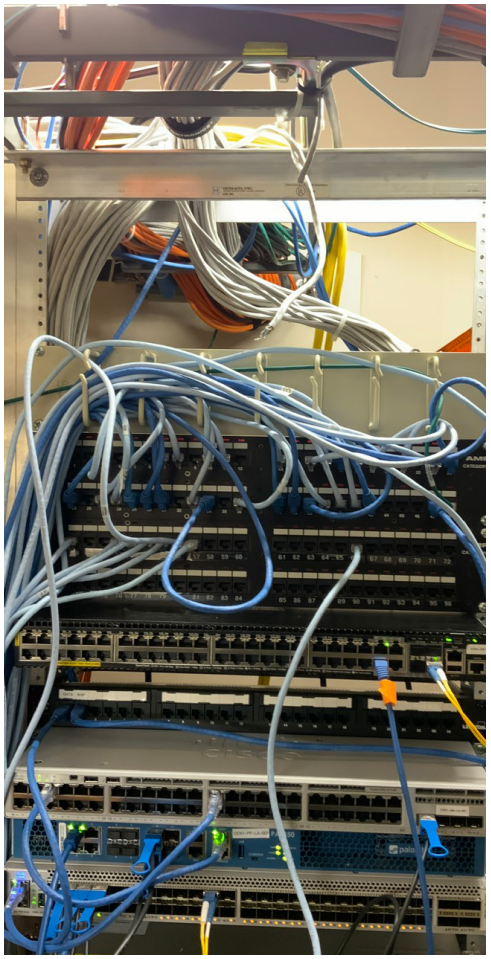
Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal 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.

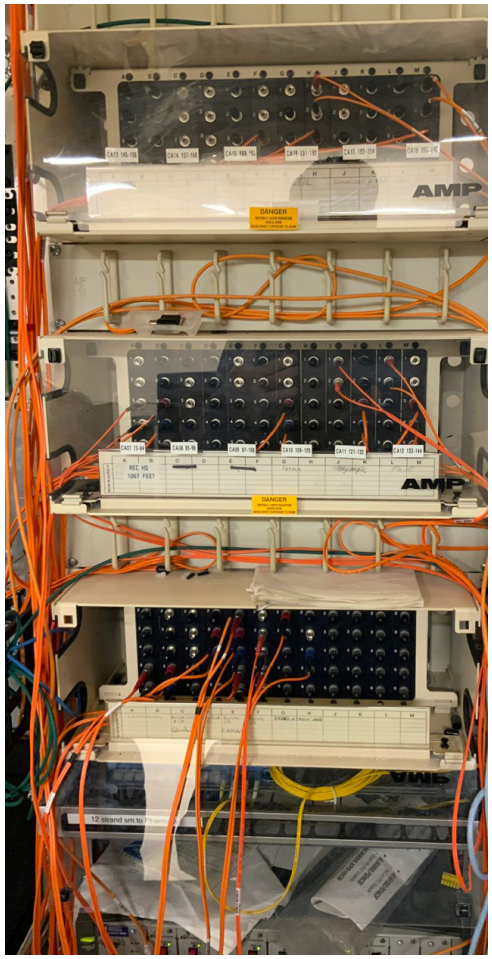
Recommendations:

- Upgrade existing port locations to Category 6A.
- Provide labels for all new cabling and existing cables to remain.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Add ladder tray and cable management as needed.
- Add Telecommunications Grounding Busbar.
- Add ductless split-system cooling unit.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.

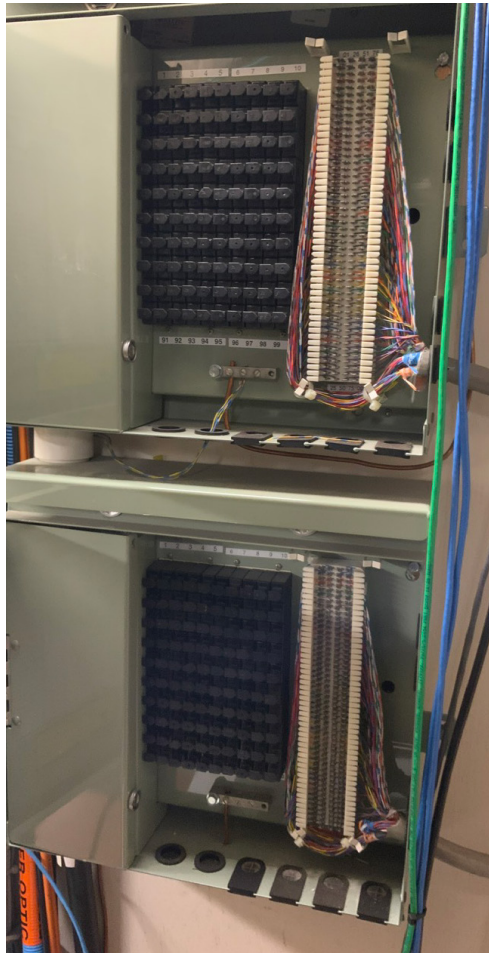
MAIN EQUIPMENT ROOM – MER-008



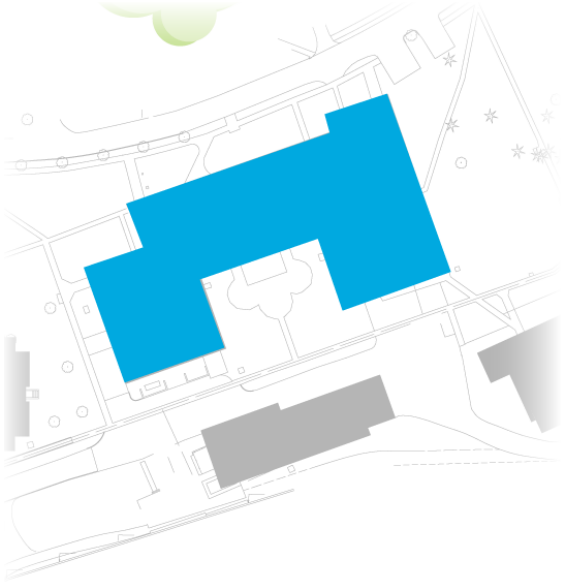
Existing Data Patching.



Existing Fiber Patching.

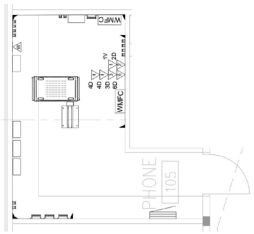


Existing Building Entrance Protection.



MULTI-PURPOSE

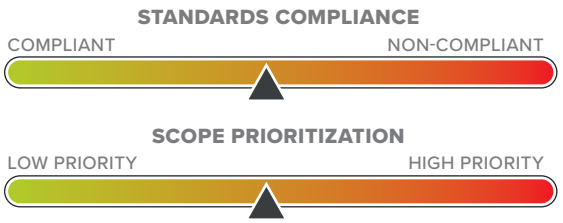
The Multi-purpose Building contains the kitchen and dining areas, the training area, and the clinic. The building was undergoing some renovations during the survey. The Administration Building is the main fiber hub for the campus.



TELECOMMUNICATIONS ROOM – TR-105

Telecommunications Room TR-105 serves as the only telecommunications space in the Multi-purpose Building. The building is served by OM1 multi-mode, OM3 multi-mode, and OS2 single-mode optical fiber cable connecting to the Administration Building and OM1 multi-mode fiber connecting to the School and Gym Building. The building is the main demarcation point for the voice service. Category 3 twisted-pair copper backbone cable connects from TR-105 to all other campus buildings. There are two floor mounted racks containing rack mount fiber cabinets, copper patch panels, cable management, network switches, and a UPS. Existing horizontal cabling is Category 5 for data, and Category 3 for voice applications. 110 and 66 blocks and building entrance protection are located on the wall. A telecommunications grounding busbar was observed. Dedicated cooling provides temperature and humidity control. Electrical infrastructure is not standards compliant.

To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports are required to meet standards. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. Dedicated cooling, ladder rack, 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:

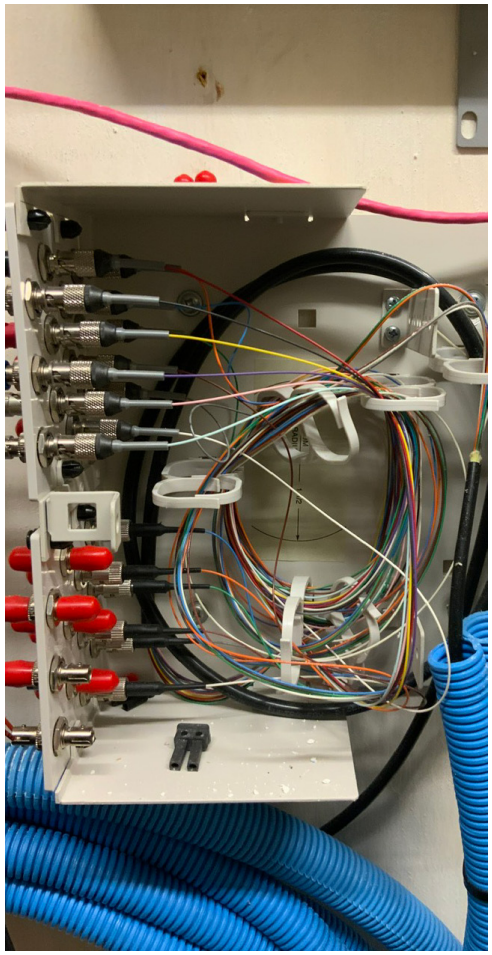
- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal cable support, leading to cables being draped or placed directly on equipment.
- Electrical infrastructure does not meet minimum requirements per standards.

Recommendations:

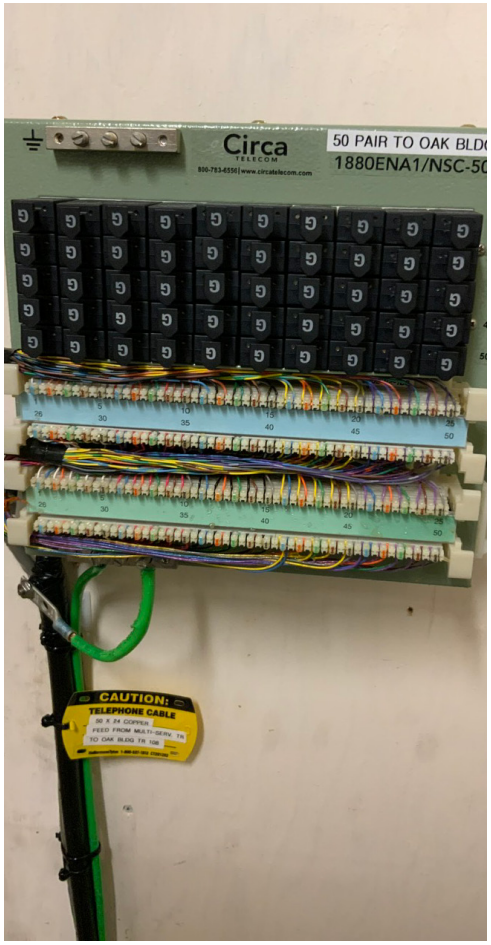
- Upgrade existing port locations to Category 6A.
- Provide labels for all new cabling and existing cables to remain.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.

TELECOMMUNICATIONS ROOM – TR-105

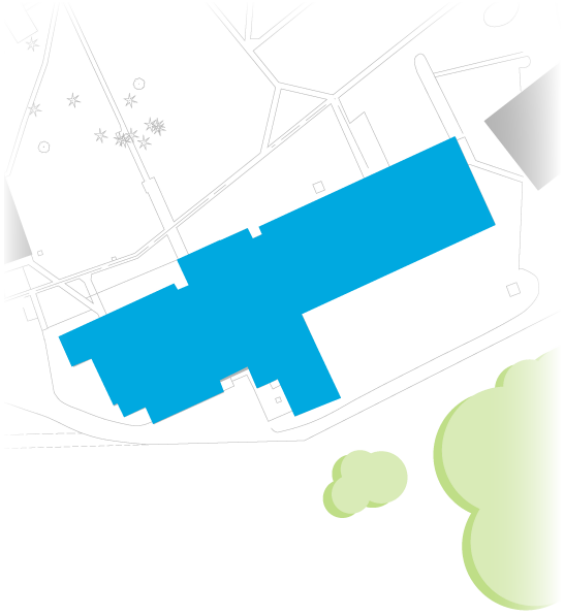
Existing Voice Patching.



Existing Fiber Patching.



Existing Building Entrance Protection.



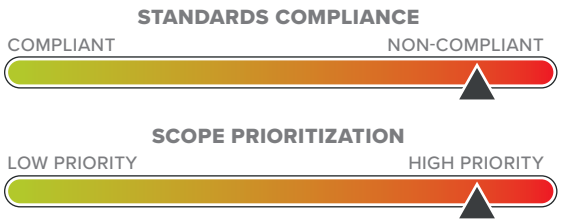
GYM & SCHOOL

The Gym & School Building contains classrooms, an administration area, the swimming pool, weight room, and a gymnasium. There are two telecommunications spaces in the building.

TELECOMMUNICATIONS ROOM – TR-114

Telecommunications Room TR-114 is a small closet with wall mounted equipment. The room has multiple wall mount fiber cabinets, 66 blocks, and building entrance protectors. Connectivity is provided by 5 OM1 multi-mode backbone optical fiber cables: a 12-strand and 6-strand to TR-105 in the Multi-purpose Building, a 12-strand to the TR-113 in the Pharmacy, a 12-strand to TR-145 in the School & Gym Building OM3 multi-mode, and OS2 single-mode optical fiber cable connecting to the Administration Building and OM1 multi-mode fiber connecting to the School and Gym Building. The building is the main demarcation point for the voice service. Category 3 twisted-pair copper backbone cable connects from TR-105 to all other campus buildings. There are two floor mounted racks containing rack mount fiber cabinets, copper patch panels, cable management, network switches, and a UPS. Existing horizontal cabling is Category 5 for data, and Category 3 for voice applications. 110 and 66 blocks and building entrance protection are located on the wall. A telecommunications grounding busbar was observed. Dedicated cooling provides temperature and humidity control. Electrical infrastructure is not standards compliant.

To meet industry standards, it is recommended to provide a new dedicated telecommunications room. The new telecommunications room should be provided with standards compliant backbone and horizontal cabling. Category 6A data ports meeting port density specified in standards are recommended. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. Dedicated cooling, ladder rack, 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.



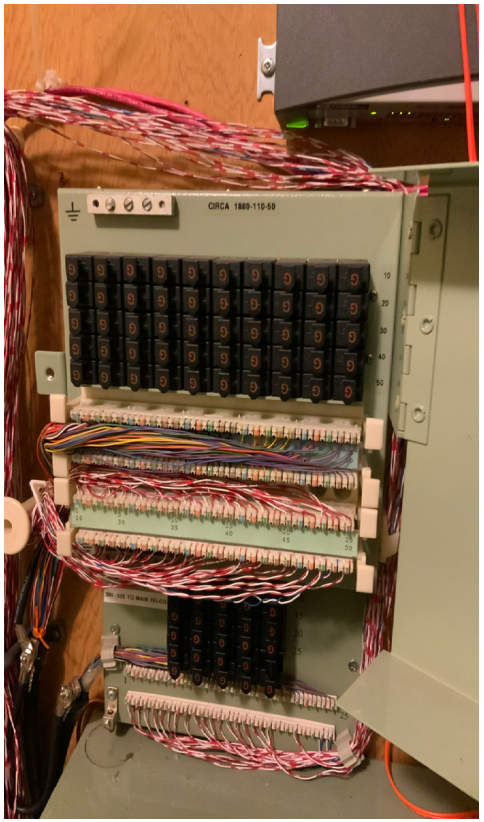
Deficiencies:

- Telecommunications room is insufficient.
- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal cable support, leading to cables being draped or placed directly on equipment.
- Electrical infrastructure does not meet minimum requirements per standards.

Recommendations:

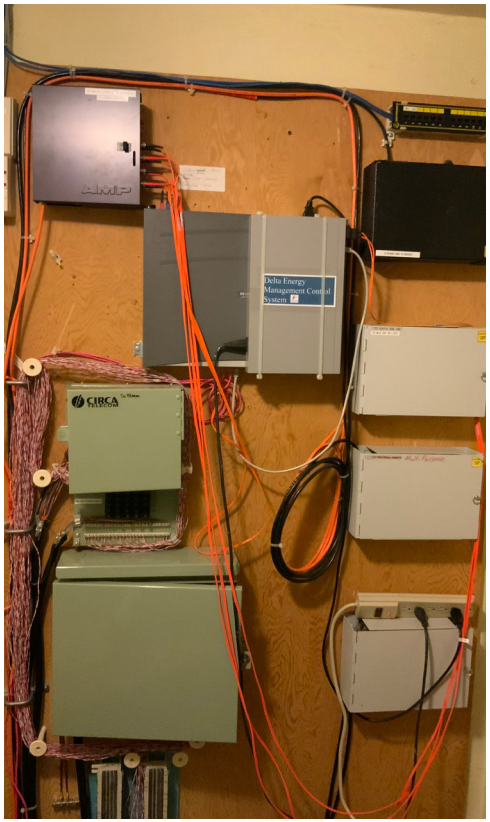
- Provide new, dedicated telecommunications room.
- Upgrade existing port locations to Category 6A.
- Provide labels for all new cabling and existing cables to remain.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.

TELECOMMUNICATIONS ROOM – TR-114

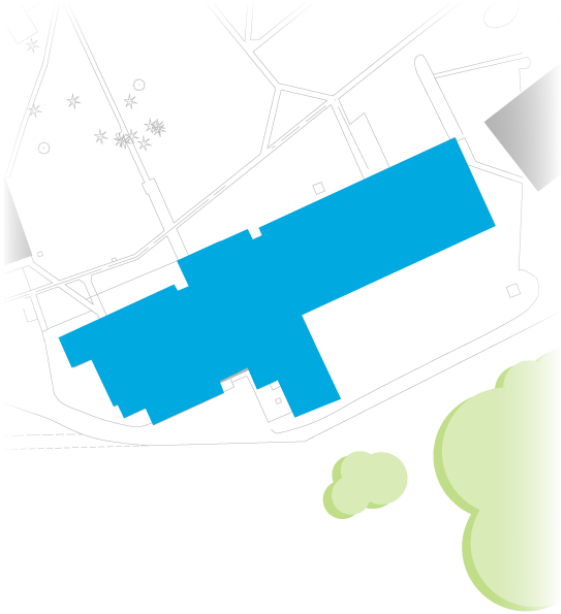


Existing Voice Patching.

Existing Cabling Routed in Cabinets.

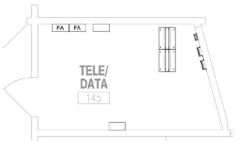


Existing Telecom Wall Elevation.



GYM & SCHOOL

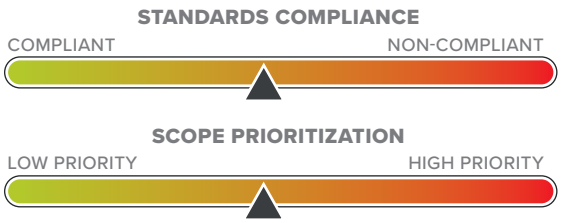
The Gym & School Building contains classrooms, an administration area, the swimming pool, weight room, and a gymnasium. There are two telecommunications spaces in the building.



TELECOMMUNICATIONS ROOM – TR-145

Telecommunications Room TR-145 is located serves the school part of the Gym & School Building. There are two racks containing a rack mount fiber cabinet, copper patch panels, network switches, access control panels, and a UPS. The room has cable management and ladder rack for cable support. There are 66 and 110 blocks for voice cable patching. Backbone connectivity is provided by 1 12-strand OM1 multi-mode optical fiber backbone cable from TR-114 and a 50-pair Category 3 twisted-pair copper backbone cable. There is no dedicated cooling, and the electrical infrastructure does not meet industry standards.

To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports are required to meet standards. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. Dedicated cooling, ladder rack, 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.



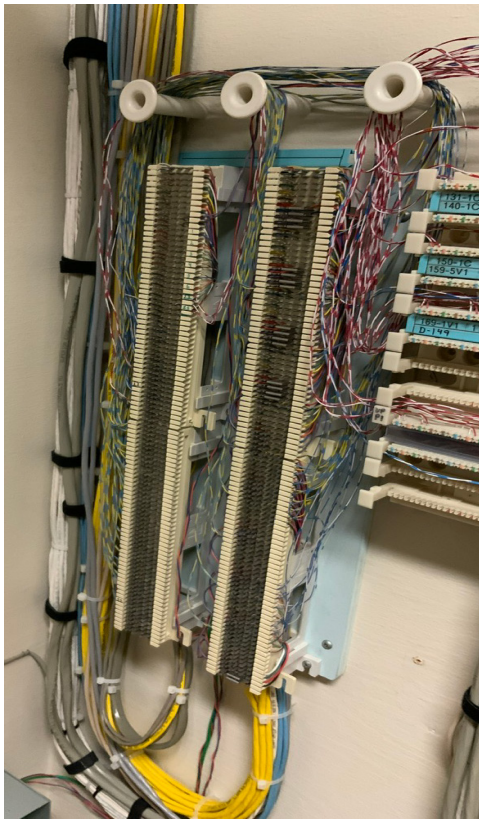
Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- No grounding busbar for the telecommunications equipment.
- No dedicated cooling system to maintain temperature of equipment.
- Electrical infrastructure does not meet minimum requirements per standards.

Recommendations:

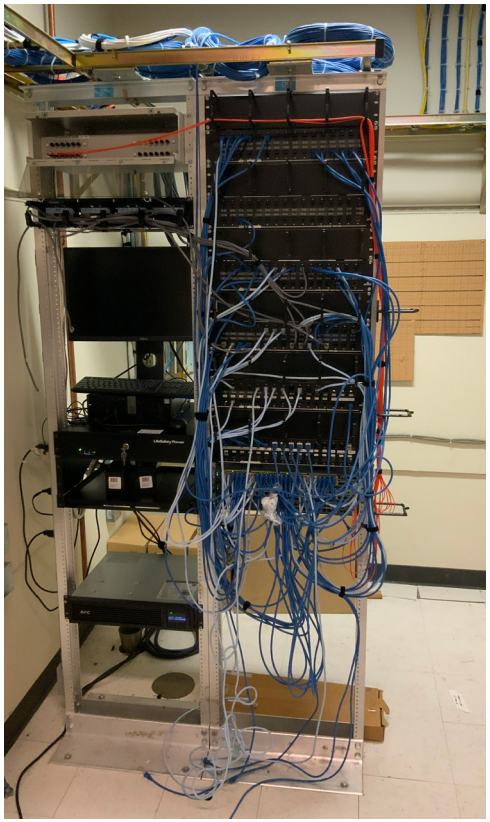
- Upgrade existing port locations to Category 6A.
- Provide labels for all new cabling and existing cables to remain.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Add Telecommunications Grounding Busbar.
- Add ductless split-system cooling unit.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.

TELECOMMUNICATIONS ROOM – TR-145

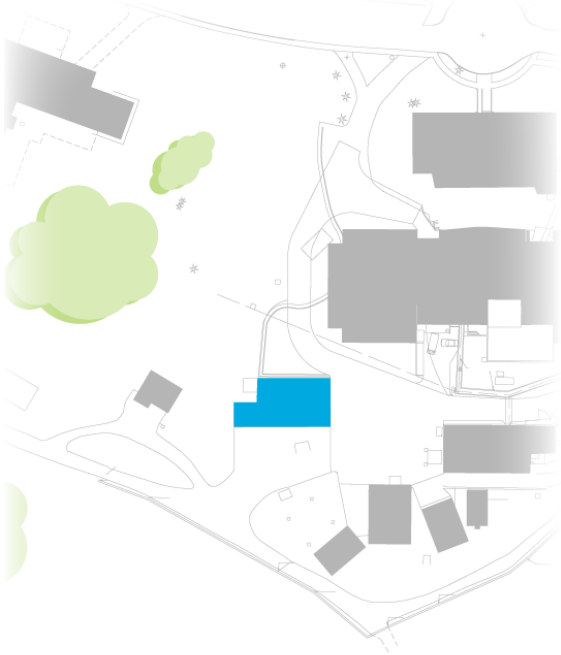


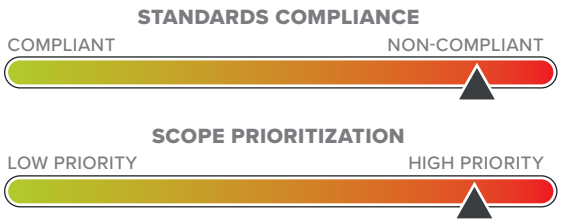
Existing Voice Patching.

Existing Fiber Patching.



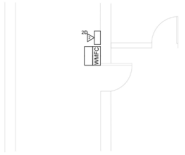
Existing Telecom Racks.





POWER PLANT

The Power plant Building contains the large, campus wide systems for hot water, heating, and cooling. There is limited telecommunications scope in the building.



TELECOMMUNICATIONS ROOM – TR-POWER PLANT

Telecommunications Room TR-Power Plant is a space on the wall in a room containing mechanical equipment. The space consists of a wall mount fiber cabinet, building entrance protectors, and a shelf holding a network switch. Connectivity is provided by a 12-strand OM1 multi-mode backbone optical fiber cable connecting to the Administration Building. A 100-pair Category 3 twisted-pair copper backbone cable connects to TR-105 in the Multi-purpose Building. Existing horizontal cabling is Category 5 for data, and Category 3 for voice applications. A telecommunications grounding busbar was not present. There is no dedicated cooling for temperature and humidity control. Electrical infrastructure is not standards compliant. There is no telecommunications room. Space is extremely limited for future expansion of telecommunication systems.

To meet industry standards, it is recommended to provide a new dedicated telecommunications room. The new telecommunications room should be provided with standards compliant backbone and horizontal cabling. Category 6A data ports meeting port density specified in standards are recommended. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. Dedicated cooling, ladder rack, 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:

- No Telecommunications Room
- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal cable support, leading to cables being draped or placed directly on equipment.
- Electrical infrastructure does not meet minimum requirements per standards.

Recommendations:

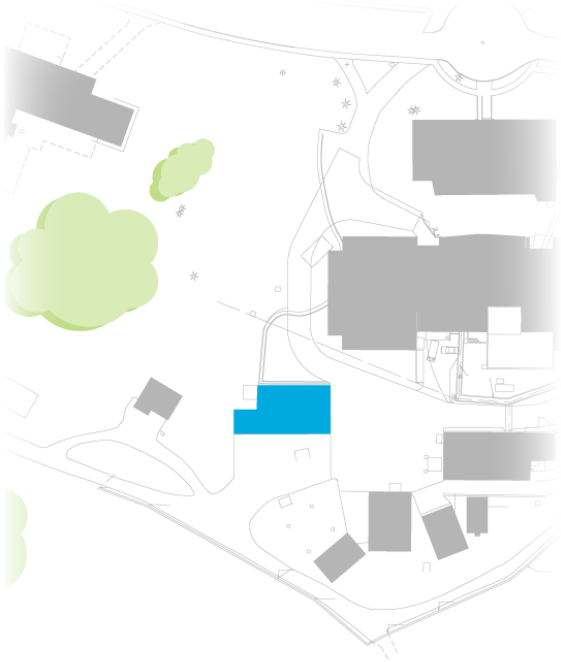
- Provide a dedicated telecommunications room.
- Upgrade existing port locations to Category 6A.
- Provide labels for all new cabling and existing cables to remain.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.

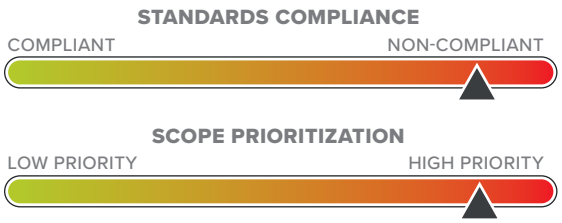
TELECOMMUNICATIONS ROOM – TR-POWER PLANT

Existing Fiber Patching Mismatch.

Existing Fiber Patching.

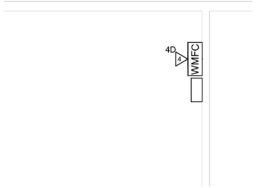
Existing Telecom Wall Elevation.





OLD COMMISSARY

The Power plant Building contains the large, campus wide systems for hot water, heating, and cooling. There is limited telecommunications scope in the building.



TELECOMMUNICATIONS ROOM – TR-OLD COMMISSARY

Telecommunications Room TR-Old Commissary is a space on the wall in one of the room Old Commissary rooms. The space consists of a wall mount fiber cabinet and building entrance protectors. Connectivity is provided by a 12-strand OM1 multi-mode backbone optical fiber cable connecting to the Administration Building. A 50-pair Category 3 twisted-pair copper backbone cable connects to TR-105 in the Multi-purpose Building. Existing horizontal cabling is Category 5 for data, and Category 3 for voice applications. A telecommunications grounding busbar was not present. There is no dedicated cooling for temperature and humidity control. Electrical infrastructure is not standards compliant. There is no telecommunications room. The existing room containing the telecommunications equipment has sufficient space to be converted to a telecommunications room.

To meet industry standards, it is recommended to relocate the telecommunications room to a dedicated room. The new telecommunications room should be provided with upgraded backbone and horizontal cabling. Additional Category 6A data ports are required to meet standards. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. Dedicated cooling, ladder rack, 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:

- No Telecommunications Room
- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal cable support, leading to cables being draped or placed directly on equipment.
- Electrical infrastructure does not meet minimum requirements per standards.

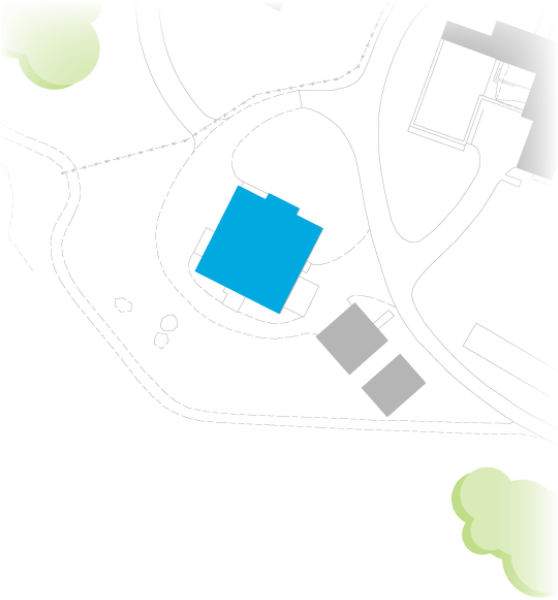
Recommendations:

- Provide a dedicated telecommunications room.
- Upgrade existing port locations to Category 6A.
- Provide labels for all new cabling and existing cables to remain.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.

TELECOMMUNICATIONS ROOM – TR-OLD COMMISSARY

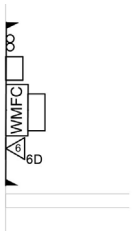
Existing Fiber Patching.

Existing Telecom Wall Elevation.



MAINTENANCE SHOP

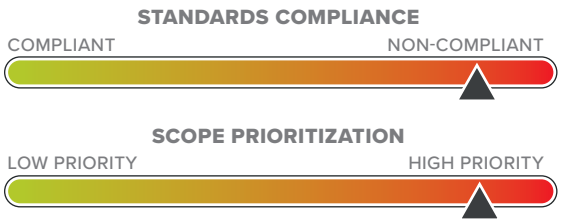
The Maintenance Shop Building is a two-story small metal building that contains the Buildings and Grounds offices and workspace. There is limited telecommunications scope in the building.



TELECOMMUNICATIONS ROOM – TR-201

The telecommunication space is situated in the upper level along the west wall in the office area. The telecommunication space is served by a 12-strand OM1 multimode optical fiber backbone cable from the Administration Building, and two 25-pair twisted-pair copper backbone cables from the Multi-purpose Building. The space is equipped with building entrance protection, 66 blocks, a wall mounted fiber cabinet, and two eight-port network switches, one supporting the Energy Management Control System and another supporting the Department of Corrections.

To meet industry standards, it is recommended to provide a new dedicated telecommunications room. The new telecommunications room should be provided with standards compliant backbone and horizontal cabling. Category 6A data ports meeting port density specified in standards are recommended. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. Dedicated cooling, ladder rack, 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.



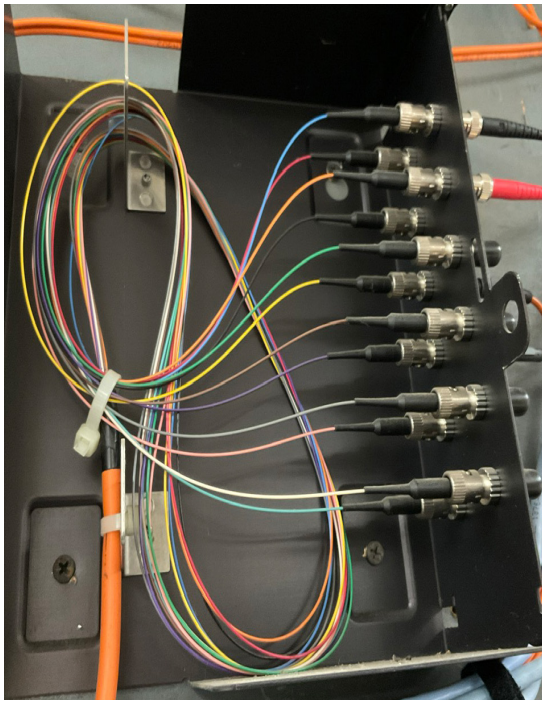
Deficiencies:

- No telecommunications room.
- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal 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.
- No identity verification.

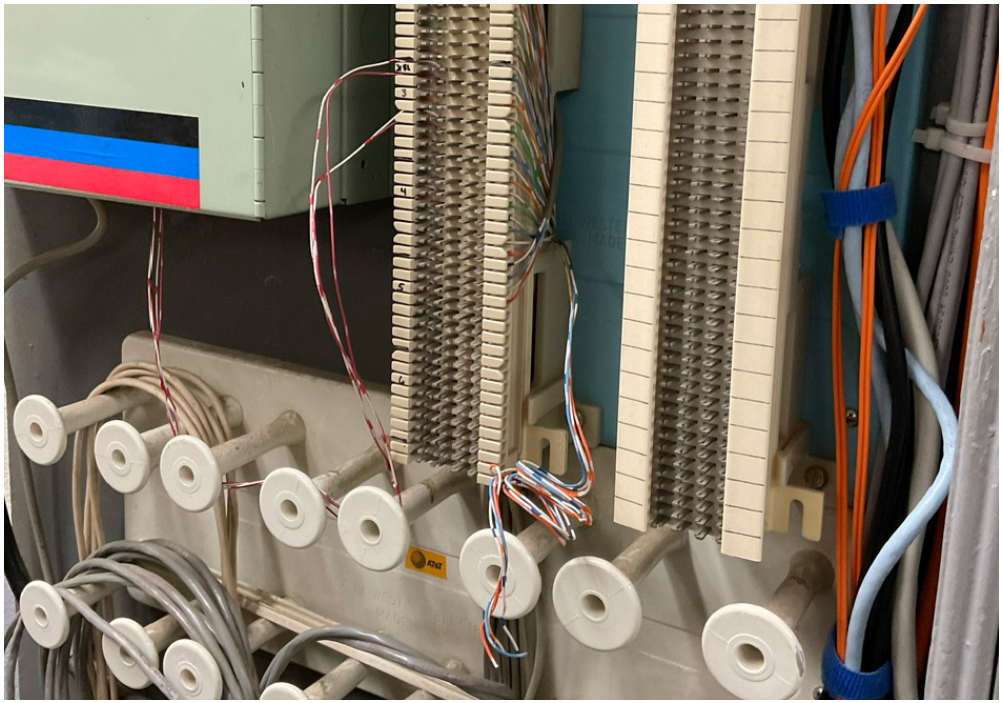
Recommendations:

- Provide a dedicated telecommunications room.
- Upgrade existing port locations to Category 6A.
- Provide labels for all new cabling and existing cables to remain.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Add ladder tray and cable management as needed.
- Add Telecommunications Grounding Busbar.
- Add ductless split-system cooling unit.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.

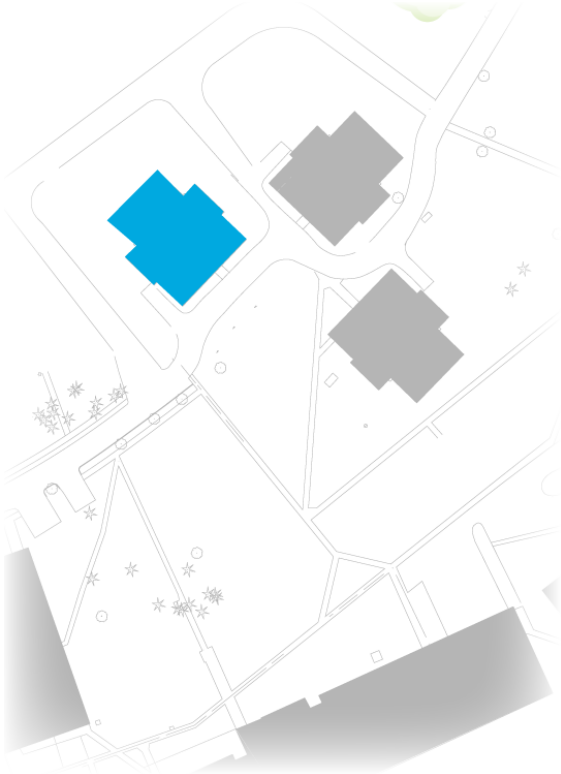
TELECOMMUNICATIONS ROOM – TR-201

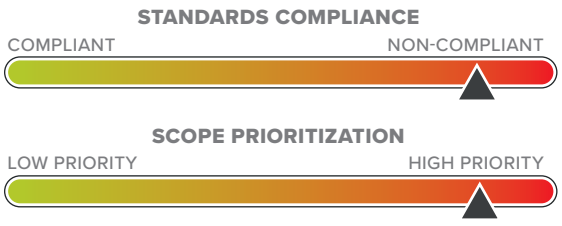


Existing Fiber Patching.



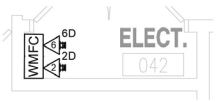
Existing Voice Patching.





OLYMPIC

The Olympic Housing Unit is a two-story housing unit for youth. There is limited telecommunications scope in the building.



TELECOMMUNICATIONS ROOM – TR-042

The telecommunications space is in the northeast staff hallway on level one inside the closet adjacent to the mechanical room. Access to the telecommunications space is controlled through key management. The telecommunication space is served by a 12-strand OM1 multimode optical fiber backbone cable from the Administration Building and a 50-pair twisted-pair copper backbone cable from the Multi-purpose Building. The space is equipped with a wall mounted fiber cabinet, building entrance protection, two 66 blocks, and eight and twenty-four-port network switches. Notably, the eight-port network switch is not secured to the wall or rack but is instead resting on top of the cable gutter. Similarly, the 24-port network switch is also not secured to a rack or wall; instead, it is resting on the floor.

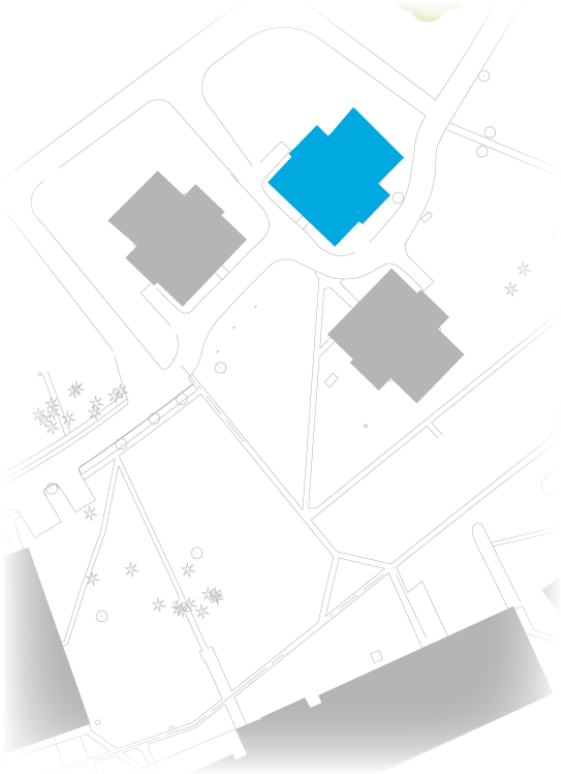
To meet industry standards, it is recommended to relocate the telecommunications room to a dedicated room. The new telecommunications room should be provided with upgraded backbone and horizontal cabling. Additional Category 6A data ports are required to meet standards. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. Dedicated cooling, ladder rack, 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.

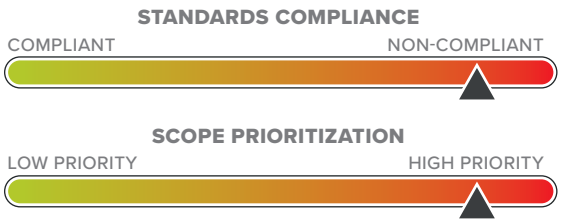
Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal 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.
- No identity verification.

Recommendations:

- Relocate TR to a dedicated room.
- Upgrade existing port locations to Category 6A.
- Provide labels for all new cabling and existing cables to remain.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Add ladder tray and cable management as needed.
- Add Telecommunications Grounding Busbar.
- Add ductless split-system cooling unit.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.





RAINIER

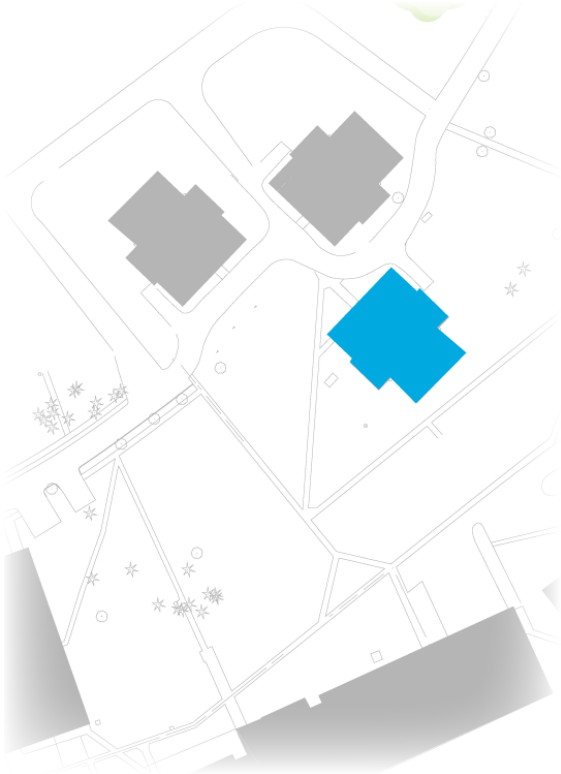
The Rainier Housing Unit is a two-story housing unit for youth. There is limited telecommunications scope in the building.

TELECOMMUNICATIONS ROOM – TR-042

The telecommunications space is in the northeast staff hallway on level one inside the closet adjacent to the mechanical room. Access to the telecommunications space is controlled through key management. The telecommunication space is served by a 12-strand OM1 multimode optical fiber backbone cable from the Administration Building and a 50-pair twisted-pair copper backbone cable from the Multi-purpose Building. The space is equipped with a wall mounted fiber cabinet, building entrance protection, two 66 blocks, and eight and twenty-four-port network switches. Notably, the eight-port network switch is not secured to the wall or rack but is instead resting on top of the cable gutter. Similarly, the 24-port network switch is also not secured to a rack or wall; instead, it is resting on the floor.

To meet industry standards, it is recommended to relocate the telecommunications room to a dedicated room. The new telecommunications room should be provided with upgraded backbone and horizontal cabling. Additional Category 6A data ports are required to meet standards. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. Dedicated cooling, ladder rack, 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.

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal 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.
- No identity verification.
- Relocate TR to a dedicated room.
- Upgrade existing port locations to Category 6A.
- Provide labels for all new cabling and existing cables to remain.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Building 31.
- Add ladder tray and cable management as needed.
- Add Telecommunications Grounding Busbar.
- Add ductless split-system cooling unit.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.



STANDARDS COMPLIANCE

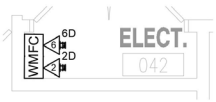
COMPLIANT — NON-COMPLIANT

SCOPE PRIORITIZATION

LOW PRIORITY — HIGH PRIORITY

PACIFIC

The Pacific Housing Unit is a two-story housing unit for youth.
There is limited telecommunications scope in the building.



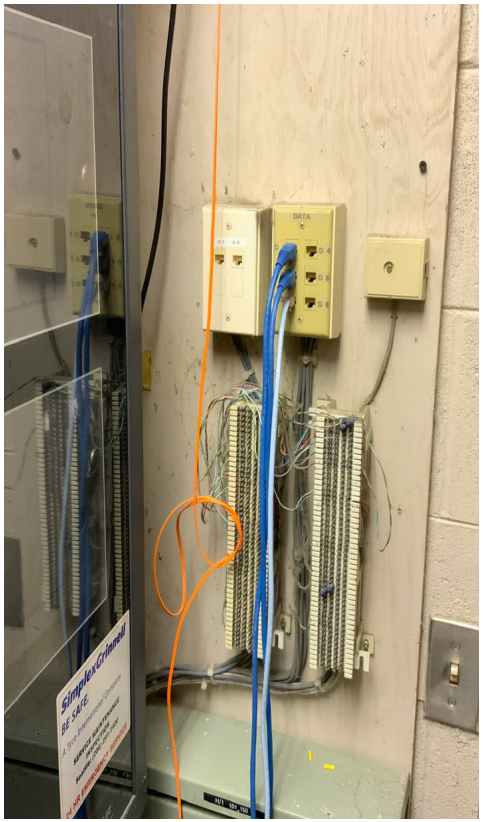
TELECOMMUNICATIONS ROOM – TR-042

The telecommunications space is in the northeast staff hallway on level one inside the closet adjacent to the mechanical room. Access to the telecommunications space is controlled through key management. The telecommunication space is served by a 12-strand OM1 multimode optical fiber backbone cable from the Administration Building and a 50-pair twisted-pair copper backbone cable from the Multi-purpose Building. The space is equipped with a wall mounted fiber cabinet, building entrance protection, two 66 blocks, and eight and twenty-four-port network switches. Notably, the eight-port network switch is not secured to the wall or rack but is instead resting on top of the cable gutter. Similarly, the 24-port network switch is also not secured to a rack or wall; instead, it is resting on the floor.

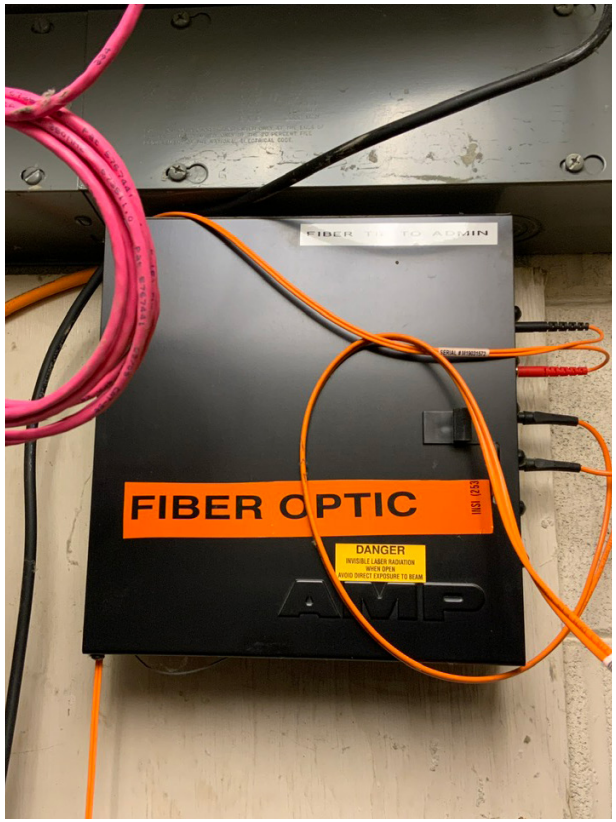
To meet industry standards, it is recommended to relocate the telecommunications room to a dedicated room. The new telecommunications room should be provided with upgraded backbone and horizontal cabling. Additional Category 6A data ports are required to meet standards. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. Dedicated cooling, ladder rack, 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.

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal 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.
- No identity verification.
- Relocate TR to a dedicated room.
- Upgrade existing port locations to Category 6A.
- Provide labels for all new cabling and existing cables to remain.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Building 31.
- Add ladder tray and cable management as needed.
- Add Telecommunications Grounding Busbar.
- Add ductless split-system cooling unit.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.

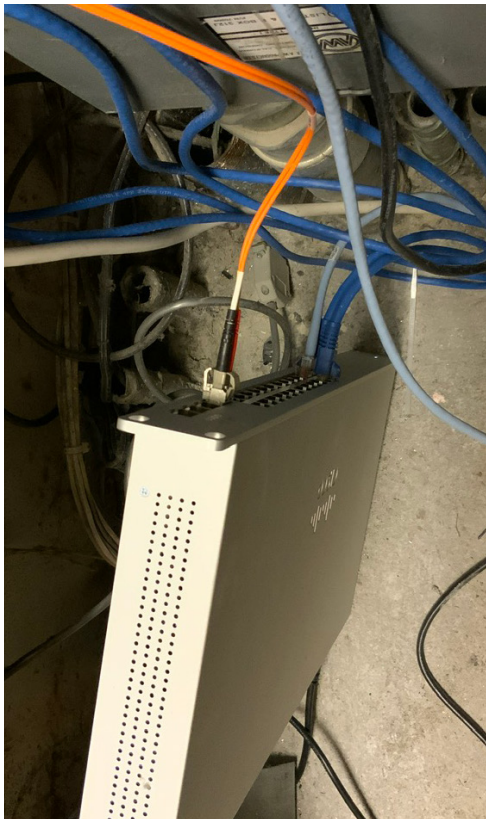
TELECOMMUNICATIONS ROOM – TR-042



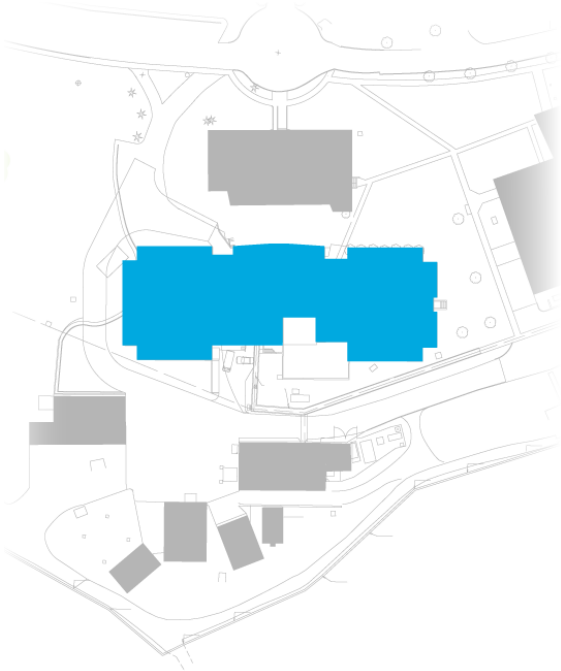
Existing Voice Patching.



Existing Fiber Cabinet.

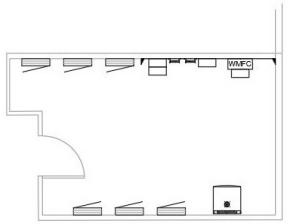


Existing Network Switch on Floor.



BAKER/CHELAN BUILDING

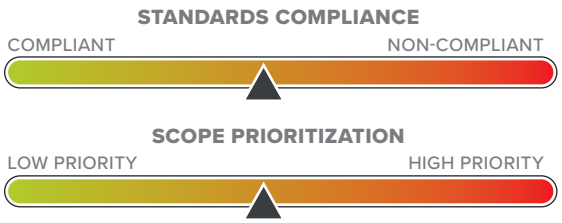
The Baker/Chelan Housing Unit is a two-story housing unit for youth.



TELECOMMUNICATIONS ROOM – TR-BAKER

Telecommunications room TR-Baker is in the attic space above the housing unit. The space is shared with electrical equipment. A wall mount rack is installed and includes a rack mount fiber cabinet, a copper patch panel, a network switch. Connectivity is provided by a 12-strand and a 6-strand single-mode optical fiber backbone cable. There is also a single-mode backbone connecting to TR-Chelan. On the wall there are building entrance protectors and 110 blocks mounted to plywood backboard. There is a wall mounted fiber cabinet and copper patch panel.

To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports are required to meet standards. Dedicated cooling, ladder rack, 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.

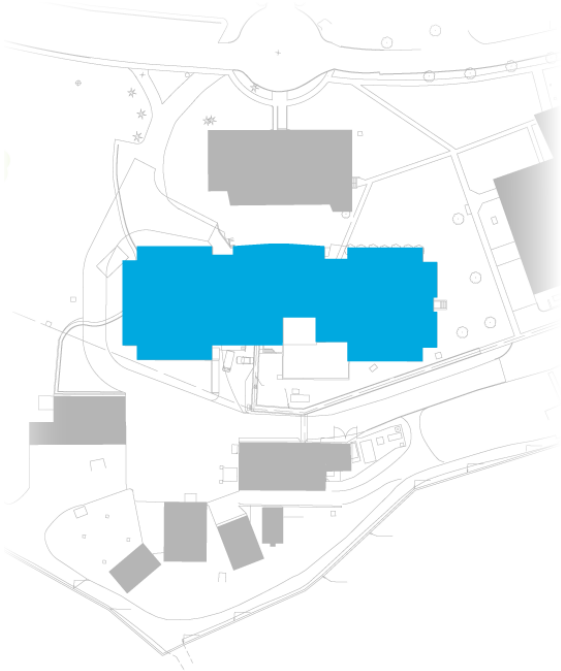


Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal 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.

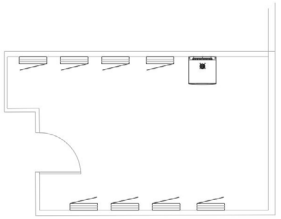
Recommendations:

- Upgrade existing port locations to Category 6A.
- Provide labels for all new cabling and existing cables to remain.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Add ladder tray and cable management as needed.
- Add Telecommunications Grounding Busbar.
- Add ductless split-system cooling unit.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.



BAKER/CHELAN BUILDING

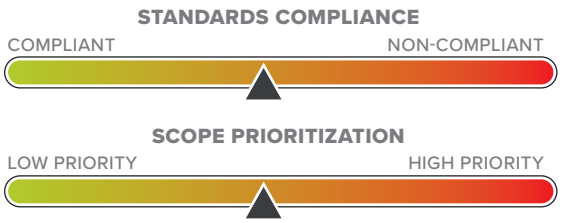
The Baker/Chelan Housing Unit is a two-story housing unit for youth.



TELECOMMUNICATIONS ROOM – TR-CHELAN

Telecommunications room TR-Baker is in the attic space above the housing unit. The space is shared with electrical equipment. A wall mount rack is installed and includes a rack mount fiber cabinet, a copper patch panel, a network switch. Connectivity is provided by a 12-strand and a 6-strand single-mode optical fiber backbone cable. There is also a single-mode backbone connecting to TR-Chelan. On the wall there are building entrance protectors and 110 blocks mounted to plywood backboard. There is a wall mounted fiber cabinet and copper patch panel.

To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports are required to meet standards. Dedicated cooling, ladder rack, 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.



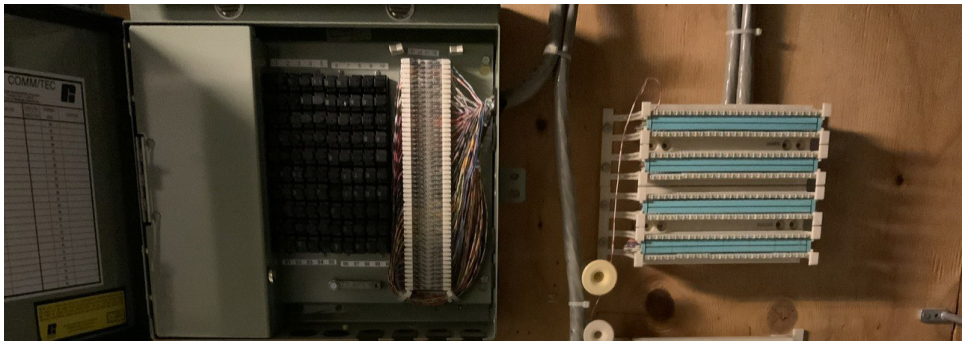
Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal 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.

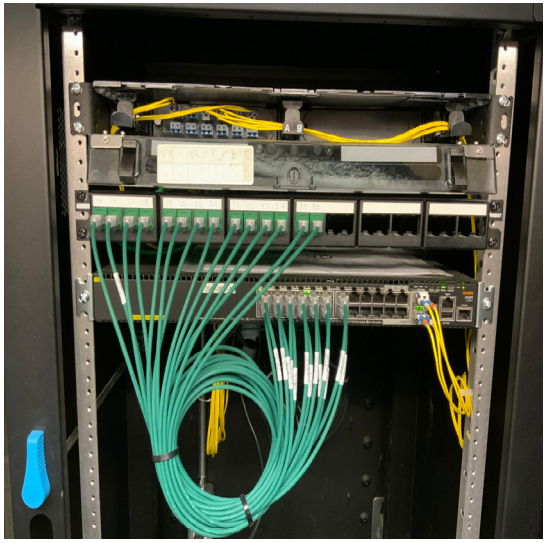
Recommendations:

- Upgrade existing port locations to Category 6A.
- Provide labels for all new cabling and existing cables to remain.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Add ladder tray and cable management as needed.
- Add Telecommunications Grounding Busbar.
- Add ductless split-system cooling unit.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.

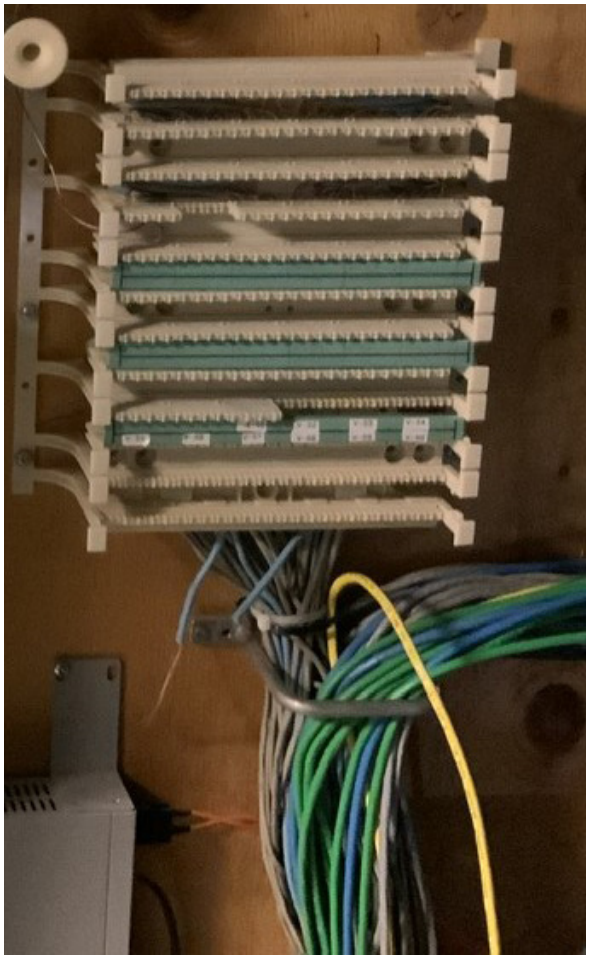
TELECOMMUNICATIONS ROOM – TR-BAKER/CHELAN



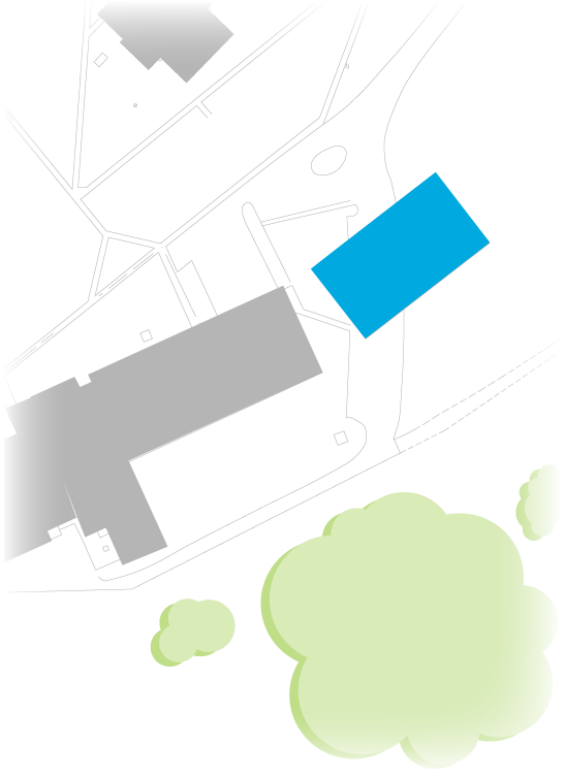
Existing Building Entrance Protection.

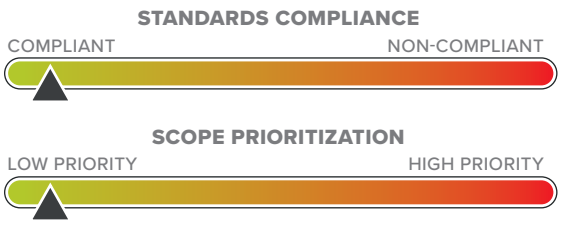


Existing Fiber & Data Patching.



Existing Voice Patching.





PHARMACY

The Pharmacy Building is the central pharmacy for all of DOC. All DOC inmates' prescriptions are prepared here and shipped to their respective prisons.

TELECOMMUNICATIONS ROOM – TR-113

Telecommunications Room 113 is positioned within the product processing area, and entry to the security office is controlled through key management. The telecommunication room is served by a 12-strand SM optical fiber cable and 50-pair 24 AWG copper cables. It is furnished with an equipment rack that supports a rack mount fiber cabinet eight-port network switch, two twenty-four port network switches, three forty-eight port patch panels, four twenty-four port patch panels, cable management, a rack-mounted fiber cabinet, and a rack mounted UPS. The 12-strand single-mode optical fiber backbone cable from the admin building terminates at the rack mounted fiber cabinet. The 25-pair twisted-pair copper backbone cable from the Administration Building connects to the building entrance protection, passes through a 110 block, and is routed to workstations.

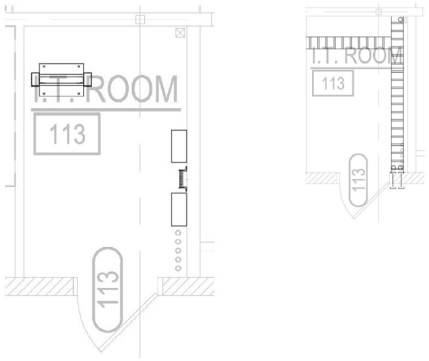
To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports are required to meet standards. The addition of card-based access control is recommended to control and track access to the space.

Deficiencies:

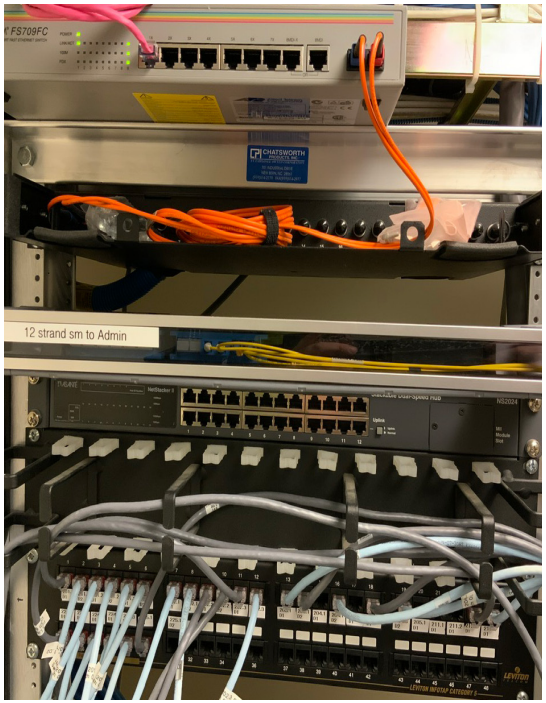
- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.

Recommendations:

- Upgrade existing port locations to Category 6A.
- Provide labels for all new cabling and existing cables to remain.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Control access to authorized individuals.

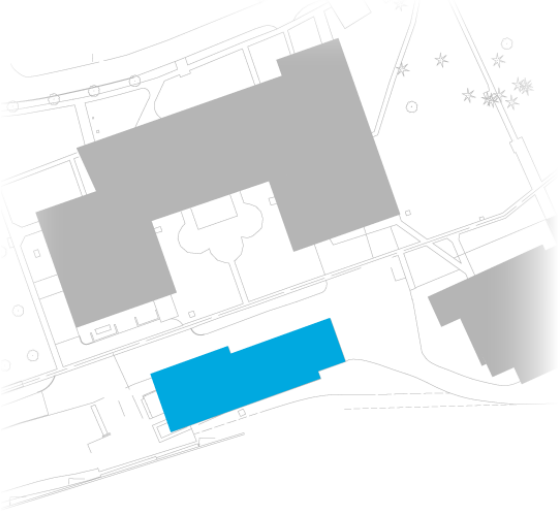


TELECOMMUNICATIONS ROOM – TR-113

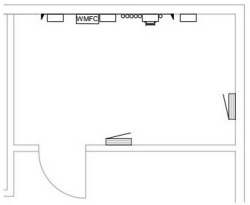


Existing Fiber & Data Patching.

Existing Voice Patching.



COMMISSARY



The Commissary Building is the receiving center for food and other goods on the campus. There is limited telecommunications scope in the building.

TELECOMMUNICATIONS ROOM – TR-COMMISSARY A

Telecommunications Room TR-Commissary A is a small wall space in a storage room in the Commissary Building. The space is shared with electrical equipment. A small horizontal wall mount rack is installed but is empty. There is a small 12 port copper patch panel mounted on the wall. A wall mount fiber cabinet with a 12-strand OM1 multi-mode optical fiber backbone cable to the Administration Building. A 25-pair twisted-pair copper backbone cable to the Multi-purpose Building connects to building entrance protection, then patches to 66 blocks.

To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. Additional Category 6A data ports are required to meet standards. Dedicated cooling, ladder rack, 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.

STANDARDS COMPLIANCE

COMPLIANT — NON-COMPLIANT

SCOPE PRIORITIZATION

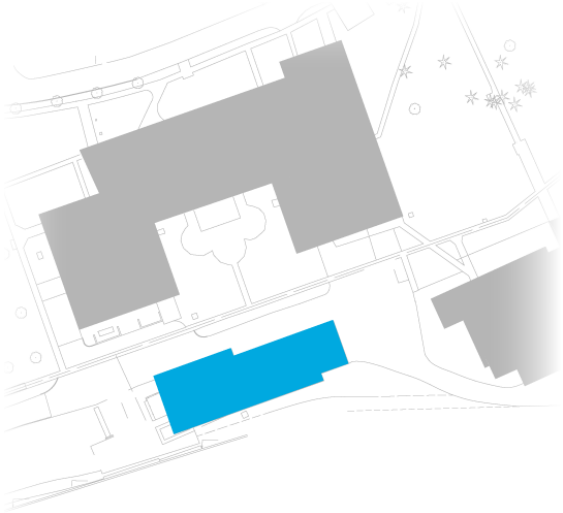
LOW PRIORITY — HIGH PRIORITY

Deficiencies:

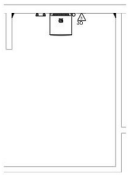
- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal cable support, leading to cables being draped or placed directly on equipment.
- No grounding busbar for the telecommunications equipment.
- No dedicated cooling system to maintain temperature of equipment.
- Electrical infrastructure does not meet minimum requirements per standards.

Recommendations:

- Upgrade existing port locations to Category 6A.
- Provide labels for all new cabling and existing cables to remain.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Add ladder tray and cable management as needed.
- Add Telecommunications Grounding Busbar.
- Add ductless split-system cooling unit.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.



COMMISSARY

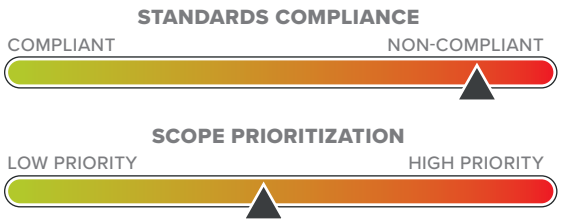


The Commissary Building is the receiving center for food and other goods on the campus. There is limited telecommunications scope in the building.

TELECOMMUNICATIONS ROOM – TR-COMMISSARY B

Telecommunications Room TR-Commissary B is a wall mount rack installed in the office space in the Commissary. Connectivity is provided by a 12-strand OM3 multi-mode optical fiber backbone cable. The rack includes a rack mount fiber cabinet, a copper patch panel, a network switch.

To meet industry standards, it is recommended to relocate the telecommunications room to a dedicated room. The new telecommunications room should be provided with upgraded backbone and horizontal cabling. Additional Category 6A data ports are required to meet standards. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. Dedicated cooling, ladder rack, 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:

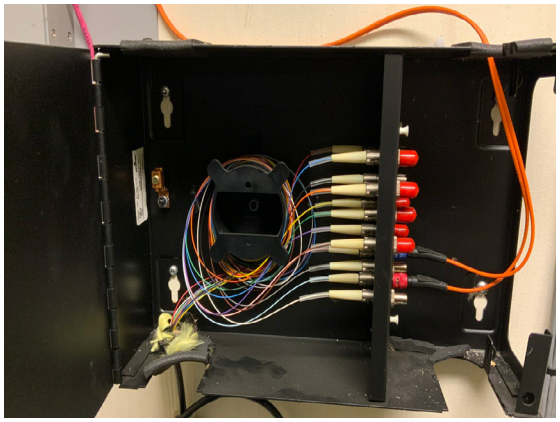
- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal cable support, leading to cables being draped or placed directly on equipment.
- No dedicated cooling system to maintain temperature of equipment.
- Electrical infrastructure does not meet minimum requirements per standards.

Recommendations:

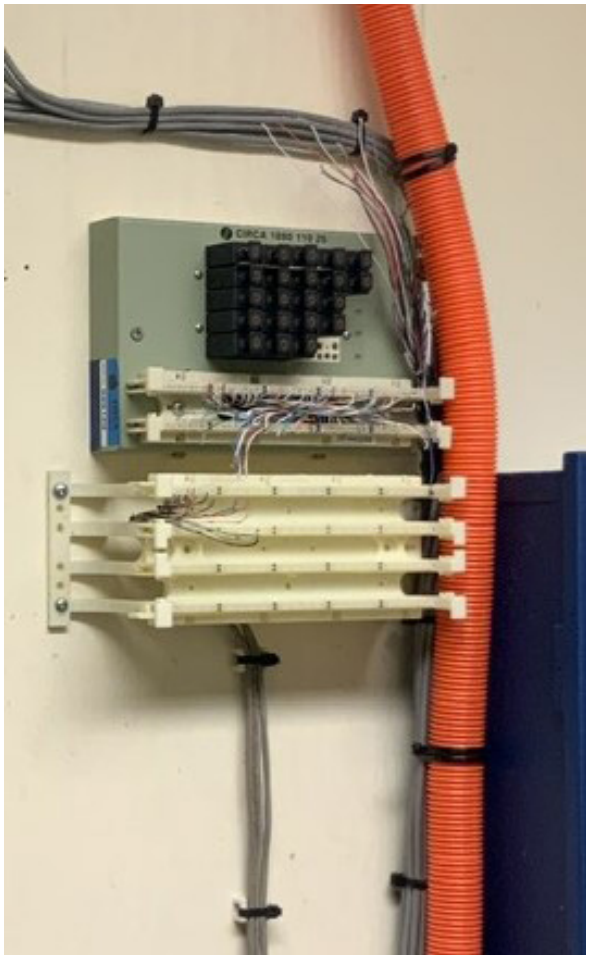
- Relocate the telecommunications space to a dedicated space.
- Upgrade existing port locations to Category 6A.
- Provide labels for all new cabling and existing cables to remain.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Add ladder tray and cable management as needed.
- Add ductless split-system cooling unit.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.

TELECOMMUNICATIONS ROOMS – COMMISSARY

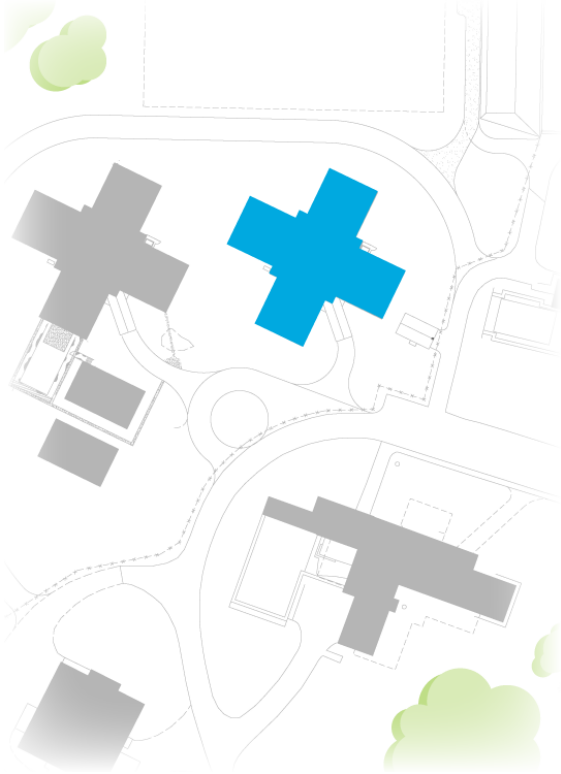
Existing Telecom Cabinet.



Existing Fiber Patching.



Existing Voice Patching.



STANDARDS COMPLIANCE

COMPLIANT — NON-COMPLIANT

SCOPE PRIORITIZATION

LOW PRIORITY — HIGH PRIORITY

COLUMBIA

The Columbia Housing Unit is one of the primary DSHS Housing Units. During the site survey, it was undergoing renovation and did not have any residents.

TELECOMMUNICATIONS ROOM – TR-143

Telecommunications Room TR-143 is the original telecommunications room for the building. It is in the Northwest side of the building and is accessed through the exterior of the building. All inter-building pathway connects to the campus through this room. The telecommunication room is served by one defunct 12-strand OM1 multi-mode optical fiber backbone cable, three 12-strand OM3 multi-mode optical fiber backbone cables, two 25-pair twisted-pair copper cables, and two coaxial cables. The defunct 12-strand OM1 multi-mode optical fiber cable, as well as one of the 25-pair twisted-pair copper cables and two coaxial cables, originate from the admin building. Two of the three 12-strand OM3 multi-mode optical fiber cables and the remaining 25-pair twisted-pair copper cables are routed to TR-151, on the interior of the building. The remaining 12-strand OM3 multi-mode optical fiber backbone cable connects Columbia to Modular Building 1.

To meet industry standards, it is recommended to maintain this telecommunications room as a passive patching point. The new TR-151 should be utilized as the primary telecommunications room with upgraded backbone cabling. The addition of card-based access control is recommended to control and track access to the space.

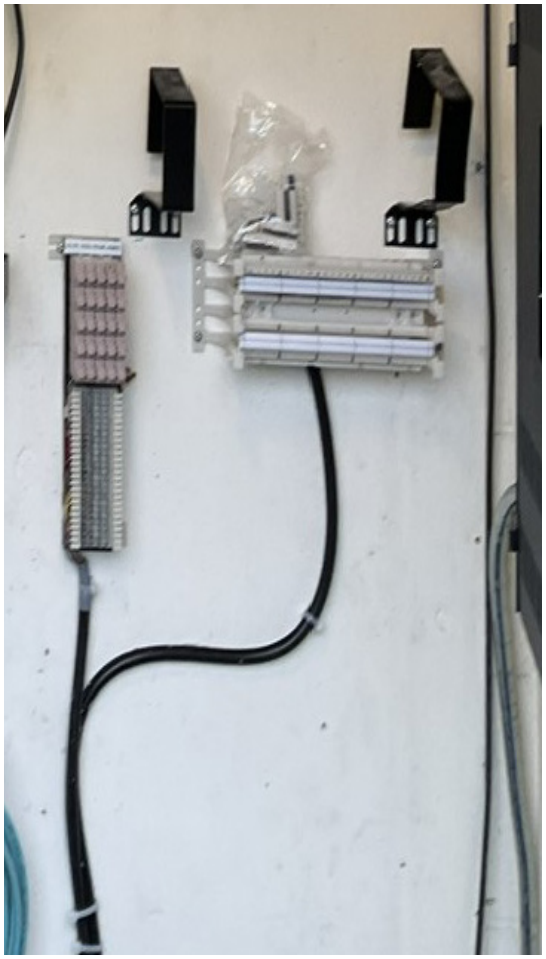
Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal cable support, leading to cables being draped or placed directly on equipment.

Recommendations:

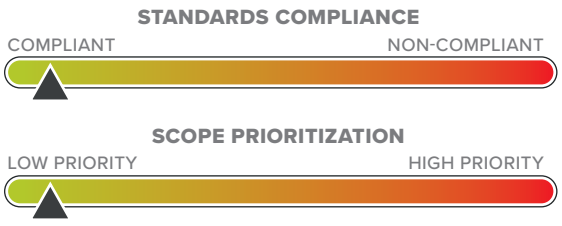
- Maintain TR as passive consolidation point.
- Provide labels for all new cabling and existing cables to remain.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Add ladder tray and cable management as needed.
- Control access to authorized individuals.

TELECOMMUNICATIONS ROOM – TR-143



Existing Voice Patching.

Existing Telecom Wall Elevation.



COLUMBIA

The Columbia Housing Unit is one of the primary DSHS Housing Units. During the site survey, it was undergoing renovation and did not have any residents.

TELECOMMUNICATIONS ROOM – TR-151

Telecommunications Room TR-151 is an internal room that has been converted to a telecommunications room as part of the remodel of the building. The wall mount rack houses copper patch panels, cable management, network switches, and a UPS. Connectivity is provided by a 12-strand OM3 multi-mode optical fiber backbone cable and a 25-pair twisted-pair copper backbone cable. A wall mount fiber cabinet, vertically mounted switch and access control panel are wall mounted to the plywood backboard.

To meet industry standards, it is recommended to upgrade the existing backbone cabling. The addition of card-based access control is recommended to control and track access to the space.

Deficiencies:

» Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.

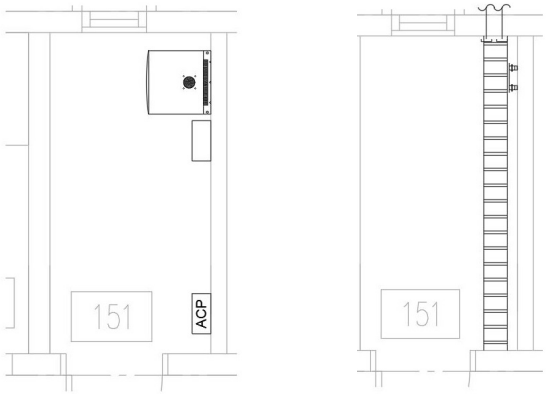
Recommendations:

» Maintain TR as primary TR for the building.

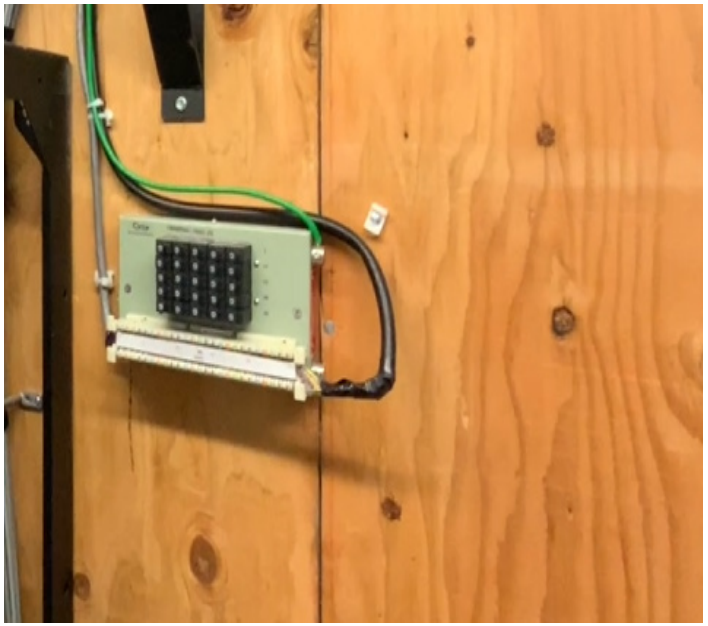
» Provide labels for all new cabling and existing cables to remain.

» Provide new 12-strand OS2 single-mode optical fiber backbone from MER in Administration Building.

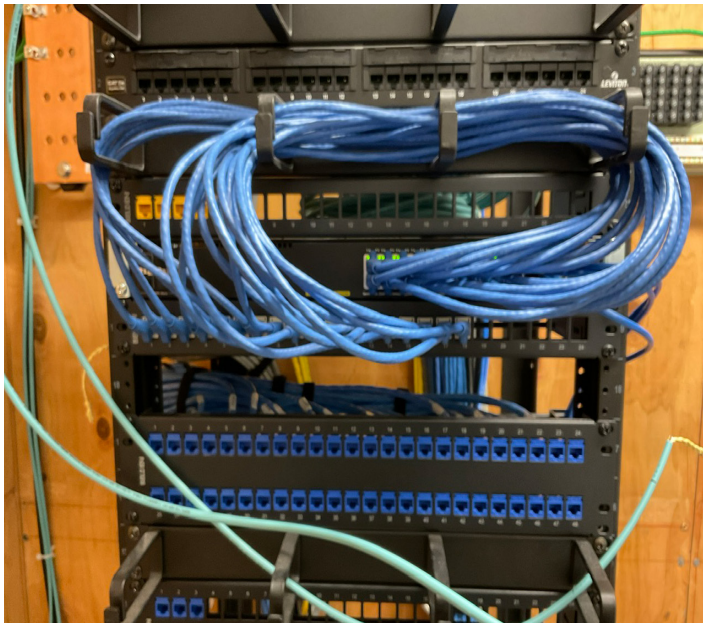
» Control access to authorized individuals.



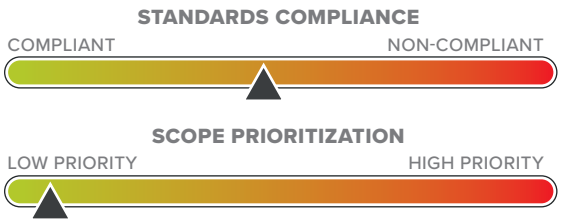
TELECOMMUNICATIONS ROOM – TR-151



Existing Building Entrance Protection.



Existing Data Patching.



COLUMBIA PORTABLE

The modular buildings are used for office space to support the DSHS programs at MLS.

TELECOMMUNICATIONS ROOM – TR-MODULAR 2

Modular Building 2 is located adjacent to Modular Building 1 within a secure courtyard next to the Cascade Housing Unit. The telecommunication room, situated in the northeast hallway, is access-controlled through key management. Connectivity is provided by a 12-strand OM3 multi-mode optical fiber backbone cable patched through Modular Building 1 to the Administration Building. Within the room, there are two equipment racks. One rack supports a rack mounted fiber cabinet, copper patch panel, cable management, a network switch, and a UPS. The other rack is unpopulated at this point. The room is supported by dedicated cooling, telecommunications grounding, and ladder rack for cable management. Voice infrastructure is provided through Modular Building 1.

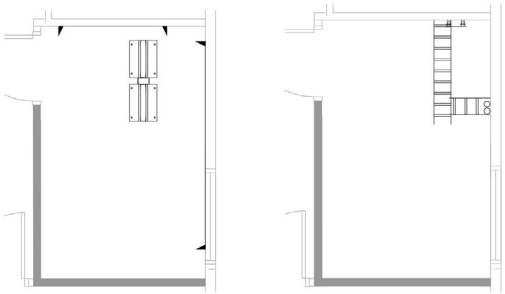
To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. The addition of card-based access control is recommended to control and track access to the space.

Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.

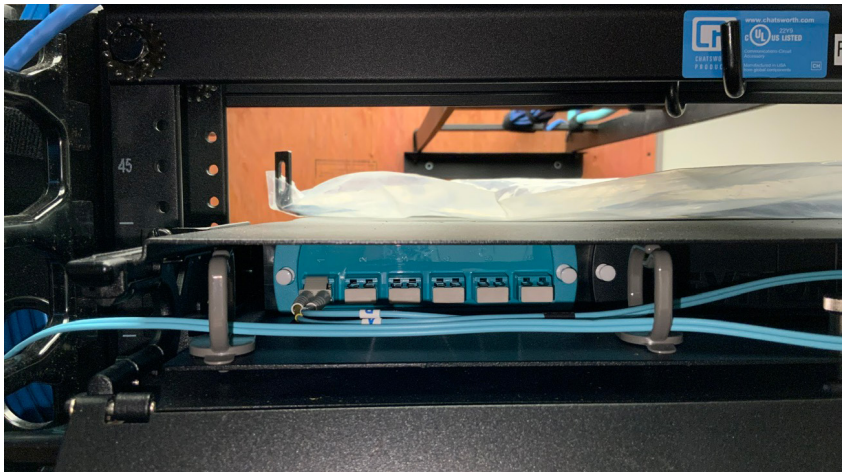
Recommendations:

- Provide labels for all new cabling and existing cables to remain.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Control access to authorized individuals.



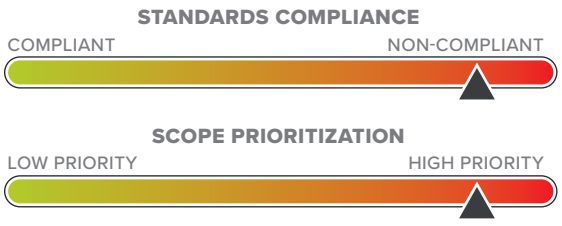
TELECOMMUNICATIONS ROOM – TR-MODULAR 2

Existing Data Patching.



Existing FIber Patching.

Existing Telecom Rack.



CASCADE

The Cascade Housing Unit is one of the primary DSHS Housing Units.

TELECOMMUNICATIONS ROOM – TR-143

The Telecommunication Room TR-143 is in the northwest corner of the building exterior and currently serves as the primary telecommunication room. Access to the room is controlled through key management. Connectivity is provided by one 12-strand OM1 multi-mode optical fiber backbone cable and two 12-strand OM3 multi-mode optical fiber backbone cables connecting to the Administration Building, and one 25-pair twisted-pair copper cable to the Multi-purpose Building. One of the 12-strand OM3 optical fiber backbone cables routes through TR-142 and connects to Modular Building 1. The room is equipped with a wall mounted rack that supports a rack mount fiber cabinet, copper patch panels, cable management, network switches, and network switches.

To meet industry standards, it is recommended to provide a new dedicated telecommunications room. The new telecommunications room should be provided with standards compliant backbone and horizontal cabling. Category 6A data ports meeting port density specified in standards are recommended. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. Dedicated cooling, ladder rack, cable management, and dedicated equipment receptacles are required to meet standards.
The addition of card-based access control is recommended to control access and track access to the space.

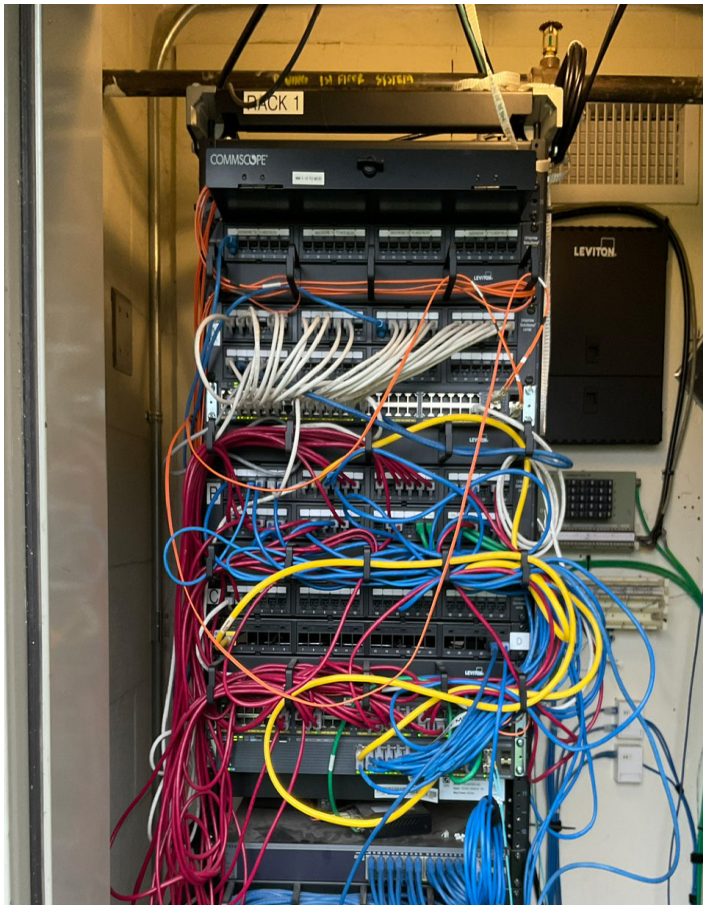
Deficiencies:

- Current telecommunications room is insufficient to meet building needs.
- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- Minimal 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.
- No identity verification.

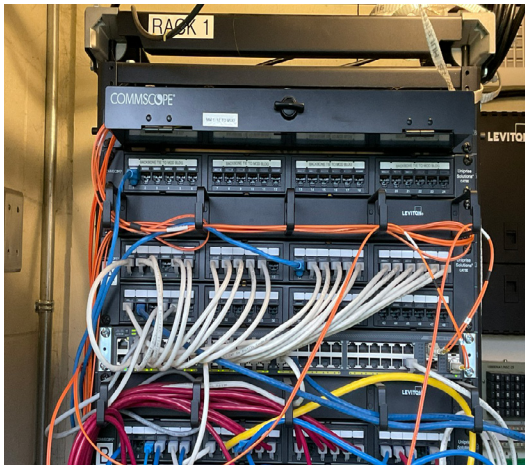
Recommendations:

- Provide a dedicated telecommunications room.
- Upgrade existing port locations to Category 6A.
- Provide labels for all new cabling and existing cables to remain.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Add ladder tray and cable management as needed.
- Add Telecommunications Grounding Busbar.
- Add ductless split-system cooling unit.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.

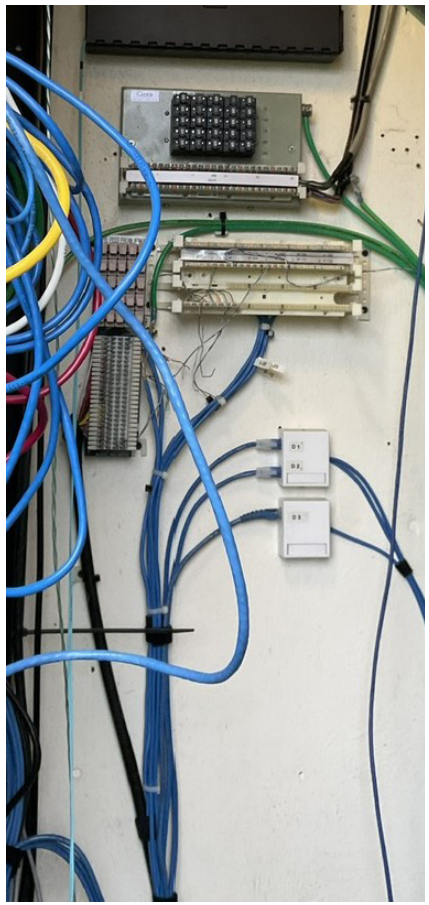
TELECOMMUNICATIONS ROOM – TR-143



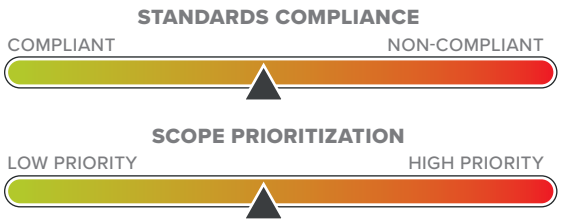
Existing Telecom Rack.



Existing Fiber & Data Patching.



Existing Voice Patching.



CASCADE PORTABLE

The modular buildings are used for office space to support the DSHS programs at MLS.

TELECOMMUNICATIONS ROOM – TR-MODULAR 1

Modular Building 1 is located within a secure courtyard next to the Cascade Housing Unit. The telecommunications room, situated in the northeast hallway, is access-controlled through key management. Connectivity is provided by a 12-strand OM3 multi-mode optical fiber backbone cable patched to the Administration Building. There are also 12-strand OM3 optical fiber backbone cables connecting to Modular Building 2, Cascade Unit, and Columbia Unit. Within the room, there are two equipment racks. One rack supports rack mounted fiber cabinets, copper patch panel, cable management, a network switch, and a UPS. The other rack is unpopulated at this point. The room is supported by dedicated cooling, telecommunications grounding, and ladder rack for cable management. Voice infrastructure is provided through a 25-pair twisted-pair copper backbone cable to the Administration Building. It terminates on building entrance protection and patches to 110 blocks.

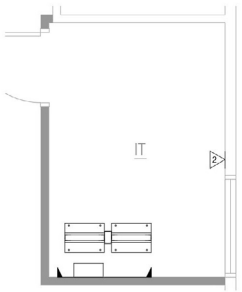
To meet industry standards, it is recommended to upgrade the existing backbone and horizontal cabling. The addition of card-based access control is recommended to control and track access to the space.

Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.

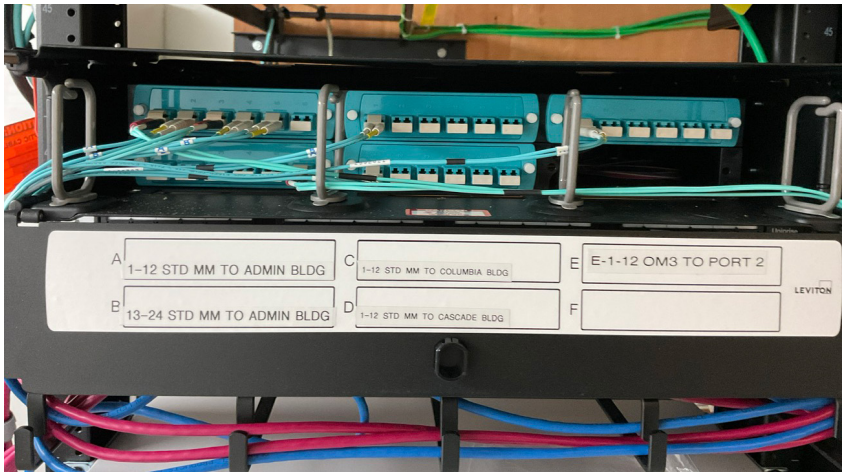
Recommendations:

- Provide labels for all new cabling and existing cables to remain.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from MER in Administration Building.
- Control access to authorized individuals.

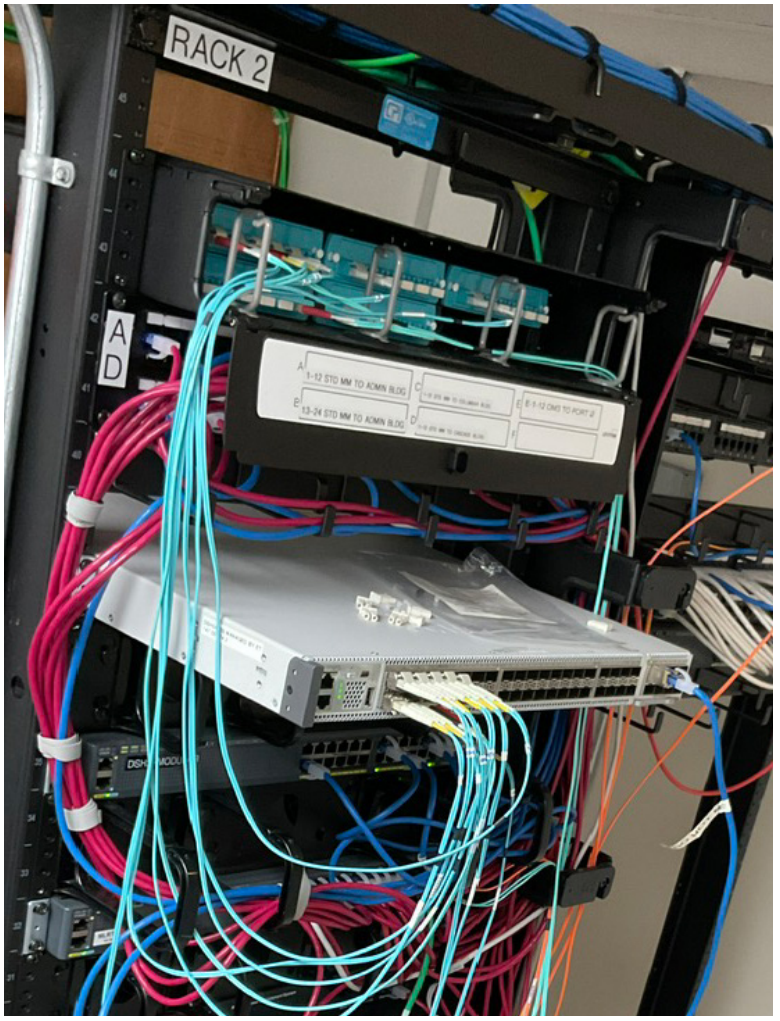


TELECOMMUNICATIONS ROOM – TR-MODULAR 1

Existing Data Patching.



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

www.hargis.biz

Telecommunications Infrastructure Assessment Recommendations
Maple Lane

BASIS OF OPINION Pre-Design | **PREPARED BY** Tin Vo | **DATE** August 15, 2024

JOB NUMBER 23188 | **CHECKED BY** Ben Helms | **OVERHEAD & PROFIT** 15%

telecommunications summary	subtotal	OH&P	total
Building 1 - Oak	$ 173,918	$ 26,088	$ 200,006
Building 9 - Laurel	$ 290,493	$ 43,574	$ 334,067
Building 10 - Administration	$ 369,992	$ 55,499	$ 425,491
Building 11 - Multi-Purpose	$ 315,912	$ 47,387	$ 363,299
Building 15 - Gym & School	$ 297,490	$ 44,624	$ 342,114
Building 16 - Power Plant	$ 99,191	$ 14,879	$ 114,070
Building 18 - Old Commissary	$ 208,952	$ 31,343	$ 240,294
Building 29 - Maintenance Shop	$ 298,730	$ 44,809	$ 343,539
Building 30 - Olympic	$ 202,681	$ 30,402	$ 233,083
Building 31 - Rainier	$ 202,880	$ 30,432	$ 233,312
Building 32 - Pacific	$ 202,481	$ 30,372	$ 232,853
Building 33 - Baker & Chelan	$ 308,345	$ 46,252	$ 354,597
Building 37 - Pharmacy	$ 172,572	$ 25,886	$ 198,458
Building 38 - Commissary	$ 136,120	$ 20,418	$ 156,538
Building 39 - Columbia	$ 435,503	$ 65,326	$ 500,829
Building 39A - Columbia Portable	$ 252,018	$ 37,803	$ 289,821
Building 40 - Cascade	$ 480,883	$ 72,132	$ 553,015
Building 40A - Cascade Portable	$ 253,455	$ 38,018	$ 291,474
Sub-Total	$ 4,701,618	$ 705,243	$ 5,406,860
General Contractor OH&P **15%**			$ 811,029
Escalation **7%**			$ 435,252
Total			**$ 6,653,141**

EXCLUSIONS

1 - Design contingency

2 - Sales Tax

telecommunications **cost opinion**

Building 1 - Oak

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	2,557.90	2,558	5,116	5,116	7,674	1,151	8,825
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	5,480.31	5,480			5,480	822	6,302
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Adaptor Plates - LC ACP	4	EA	150.00	600	50	200	800	120	920
Rack Mount Fiber Cabinet - 2RU	1	EA	300.00	300	110	110	410	62	472
2000VA UPS	1	EA	3,000.00	3,000	110	110	3,110	467	3,577
12 Strand Singlemode Outside Plant (OSP) OFC	2,150	LF	2.50	5,375		108	5,483	822	6,305
12 Strand Multimode Outside Plant (OSP) OFC	2,150	LF	1.19	2,554		108	2,662	399	3,061
Telecommunications Device - 4-Port	58	EA	1,100.00	63,800	474	27,473	91,273	13,691	104,964
CAT 6A Quickport Connector	464	EA	36.16	16,776	25	11,600	28,376	4,256	32,633
CAT 6A Patch Panel	5	EA	320.11	1,601	150	750	2,351	353	2,703
Copper 6-port Empty Cassette	40	EA	100.00	4,000	50	2,000	6,000	900	6,900
Pathway per Drop	58	EA	200.00	11,600	150	8,700	20,300	3,045	23,345
Subtotal Low-Voltage Systems (Divisions 27)							173,918	26,088	200,006

telecommunications **cost opinion**

Building 9 - Laurel

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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1201 third avenue, ste 600
seattle, washington 98101
206.448.3376

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	5,354.30	5,354	10,709	10,709	16,063	2,409	18,472
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	7,363.78	7,364			7,364	1,105	8,468
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Telecommunications Rooms - HC	1	EA	12,000.00	12,000	2,500	2,500	14,500	2,175	16,675
Adaptor Plates - LC ACP	4	EA	150.00	600	50	200	800	120	920
Rack Mount Fiber Cabinet - 2RU	1	EA	300.00	300	110	110	410	62	472
Ladder Rack	60	LF	7.50	450	20	1,200	1,650	248	1,898
2000VA UPS	1	EA	3,000.00	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 Singlemode Outside Plant (OSP) OFC	1,000	LF	2.50	2,500		50	2,550	383	2,933
12 Strand Multimode Outside Plant (OSP) OFC	1,000	LF	1.19	1,188		50	1,238	186	1,424
Trenching	650	LF	7.50	4,875	15	9,750	14,625	2,194	16,819

telecommunications **cost opinion**

Building 9 - Laurel

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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seattle, washington 98101
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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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
(4)4"C w/ 3" 3-Cell Textile Innerduct	650	LF	61.40	39,910	71	46,150	86,060	12,909	98,969
Utility Vault (Medium)	2	EA	4,335.00	8,670	3,500	7,000	15,670	2,351	18,021
Telecommunications Device - 4-Port	32	EA	1,100.00	35,200	474	15,158	50,358	7,554	57,911
Telecommunications Device - 4-Port - Existing	5	EA	1,100.00	5,500	474	2,368	7,868	1,180	9,049
CAT 6A Quickport Connector	256	EA	36.16	9,256	25	6,400	15,656	2,348	18,004
CAT 6A Quickport Connector - Existing	40	EA	36.16	1,446	26	1,040	2,486	373	2,859
CAT 6A Patch Panel	4	EA	320.11	1,280	150	600	1,880	282	2,163
Copper 6-port Empty Cassette	32	EA	100.00	3,200	50	1,600	4,800	720	5,520
Telecom Room - Electrical Improvements	1	EA	4,000.00	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500.00	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	32	EA	200.00	6,400	150	4,800	11,200	1,680	12,880
Subtotal Low-Voltage Systems (Divisions 27)							277,788	41,668	319,456
DIVISION 28 **LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28**									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138.02	138	276	276	414	62.11	476

telecommunications **cost opinion**

Building 9 - Laurel

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280.40	280			280	42.06	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200.00	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800.00	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535.00	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100.00	100	50	50	150	23	173
Card Reader	1	EA	325.00	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800.00	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125.00	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400.00	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 10 - Administration

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	5,553.09	5,553	11,106	11,106	16,659	2,499	19,158
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	10,931.71	10,932			10,932	1,640	12,571
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Demolish Defunct Infrastructure After System Cutover	1	LS			2,000	2,000	2,000	300	2,300
Telecommunications Device - 4-Port	78	EA	1,100.00	85,800	474	36,947	122,747	18,412	141,158
Telecommunications Device - 4-Port - Existing	51	EA	1,100.00	56,100	474	24,157	80,257	12,039	92,296
CAT 6A Quickport Connector	624	EA	36.16	22,561	25	15,600	38,161	5,724	43,886
CAT 6A Quickport Connector - Existing	408	EA	36.16	14,752	26	10,608	25,360	3,804	29,164
CAT 6A Patch Panel	11	EA	320.11	3,521	150	1,650	5,171	776	5,947
Copper 6-port Empty Cassette	88	EA	100.00	8,800	50	4,400	13,200	1,980	15,180
Telecom Room - Electrical Improvements	1	EA	4,000.00	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500.00	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	78	EA	200.00	15,600	150	11,700	27,300	4,095	31,395
Subtotal Low-Voltage Systems (Divisions 27)							357,287	53,593	410,880

telecommunications **cost opinion**

Building 10 - Administration

Telecommunications Infrastructure Assessment Recommendations

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	138.02	138	276	276	414	62.11	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280.40	280			280	42.06	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200.00	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800.00	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535.00	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100.00	100	50	50	150	23	173
Card Reader	1	EA	325.00	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800.00	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125.00	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400.00	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 11 - Multi-purpose

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	4,685.45	4,685	9,371	9,371	14,056	2,108	16,165
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	9,306.76	9,307			9,307	1,396	10,703
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Adaptor Plates - LC ACP	4	EA	150.00	600	50	200	800	120	920
Rack Mount Fiber Cabinet - 2RU	1	EA	300.00	300	110	110	410	62	472
Ladder Rack	40	LF	7.50	300	20	800	1,100	165	1,265
Demolish Defunct Infrastructure After System Cutover	1	LS			2,000	2,000	2,000	300	2,300
12 Strand Singlemode Outside Plant (OSP) OFC	1,050	LF	2.50	2,625		53	2,678	402	3,079
12 Strand Multimode Outside Plant (OSP) OFC	1,050	LF	1.19	1,247		53	1,300	195	1,495
Telecommunications Device - 4-Port	75	EA	1,100.00	82,500	474	35,525	118,025	17,704	135,729
Telecommunications Device - 4-Port - Existing	29	EA	1,100.00	31,900	474	13,737	45,637	6,845	52,482
CAT 6A Quickport Connector	600	EA	36.16	21,694	25	15,000	36,694	5,504	42,198
CAT 6A Quickport Connector - Existing	232	EA	36.16	8,388	26	6,032	14,420	2,163	16,583
CAT 6A Patch Panel	9	EA	320.11	2,881	150	1,350	4,231	635	4,866
Copper 6-port Empty Cassette	72	EA	100.00	7,200	50	3,600	10,800	1,620	12,420
Telecom Room - Electrical Improvements	1	EA	4,000.00	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500.00	7,500	1,500	1,500	9,000	1,350	10,350

telecommunications **cost opinion**

Building 11 - Multi-purpose

Telecommunications Infrastructure Assessment Recommendations

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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
Pathway per Drop	75	EA	200.00	15,000	150	11,250	26,250	3,938	30,188
Subtotal Low-Voltage Systems (Divisions 27)							303,207	45,481	348,688
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138.02	138	276	276	414	62.11	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280.40	280			280	42.06	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200.00	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800.00	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535.00	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100.00	100	50	50	150	23	173
Card Reader	1	EA	325.00	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800.00	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125.00	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400.00	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 15 - Gym & School

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	4,107.51	4,108	8,215	8,215	12,323	1,848	14,171
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	8,783.35	8,783			8,783	1,318	10,101
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Telecommunications Rooms - HC	1	EA	4,500.00	4,500	1,200	1,200	5,700	855	6,555
Adaptor Plates - LC ACP	8	EA	150.00	1,200	50	400	1,600	240	1,840
Rack Mount Fiber Cabinet - 2RU	2	EA	300.00	600	110	220	820	123	943
Ladder Rack	40	LF	7.50	300	20	800	1,100	165	1,265
2000VA UPS	1	EA	3,000.00	3,000	110	110	3,110	467	3,577
Demolish Defunct Infrastructure After System Cutover	1	LS			4,000	4,000	4,000	600	4,600
12 Strand Singlemode Outside Plant (OSP) OFC	2,500	LF	2.50	6,250		125	6,375	956	7,331
12 Strand Multimode Outside Plant (OSP) OFC	2,500	LF	1.19	2,970		125	3,095	464	3,559
Telecommunications Device - 4-Port	34	EA	1,100.00	37,400	474	16,105	53,505	8,026	61,531
Telecommunications Device - 4-Port - Existing	51	EA	1,100.00	56,100	474	24,157	80,257	12,039	92,296
CAT 6A Quickport Connector	272	EA	36.16	9,834	25	6,800	16,634	2,495	19,130
CAT 6A Quickport Connector - Existing	408	EA	36.16	14,752	26	10,608	25,360	3,804	29,164
CAT 6A Patch Panel	8	EA	320.11	2,561	150	1,200	3,761	564	4,325
Copper 6-port Empty Cassette	64	EA	100.00	6,400	50	3,200	9,600	1,440	11,040
Telecom Room - Electrical Improvements	2	EA	4,000.00	8,000	2,500	5,000	13,000	1,950	14,950
Telecom Room - HVAC - Ductless Split System	2	EA	7,500.00	15,000	1,500	3,000	18,000	2,700	20,700

telecommunications **cost opinion**

Building 15 - Gym & School

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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
Pathway per Drop	34	EA	200.00	6,800	150	5,100	11,900	1,785	13,685
Subtotal Low-Voltage Systems (Divisions 27)							278,923	41,838	320,762
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	209.64	210	419	419	629	94.34	723
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	390.40	390			390	58.56	449
Raceway, Cabling Supports and Outlet Boxes	2	EA	200.00	400	200	400	800	120	920
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800.00	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535.00	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170	170	1,095	164	1,259
Portal Licenses	2	EA	100.00	200	50	100	300	45	345
Card Reader	2	EA	325.00	650	128	255	905	136	1,041
Electrified Hardware (Electrified Lock and Power Transfer)	2	EA	1,800.00	3,600	600	1,200	4,800	720	5,520
Request To Exit (REX)	2	EA	125.00	250	85	170	420	63	483
Wiring - Per Access Control Door	2	EA	400.00	800	700	1,400	2,200	330	2,530
Programming	1	LS			1,952	1,952	1,952	293	2,245
Engineering	1	LS			976	976	976	146	1,122
Subtotal Life Safety and Security Systems (Divisions 28)							18,567	2,785	21,352

telecommunications **cost opinion**

Building 16 - Power Plant

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	1,266.05	1,266	2,532	2,532	3,798	570	4,368
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	2,731.77	2,732			2,732	410	3,142
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Telecommunications Rooms - HC	1	EA	12,000.00	12,000	2,500	2,500	14,500	2,175	16,675
Adaptor Plates - LC ACP	4	EA	150.00	600	50	200	800	120	920
Rack Mount Fiber Cabinet - 2RU	1	EA	300.00	300	110	110	410	62	472
Ladder Rack	60	LF	7.50	450	20	1,200	1,650	248	1,898
2000VA UPS	1	EA	3,000.00	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 Singlemode Outside Plant (OSP) OFC	300	LF	2.50	750		15	765	115	880
12 Strand Multimode Outside Plant (OSP) OFC	300	LF	1.19	356		15	371	56	427
Telecommunications Device - 4-Port	13	EA	1,100.00	14,300	474	6,158	20,458	3,069	23,526
Telecommunications Device - 4-Port - Existing	2	EA	1,100.00	2,200	474	947	3,147	472	3,619
CAT 6A Quickport Connector	104	EA	36.16	3,760	25	2,600	6,360	954	7,314
CAT 6A Quickport Connector - Existing	16	EA	36.16	578	26	416	994	149	1,144
CAT 6A Patch Panel	2	EA	320.11	640	150	300	940	141	1,081
Copper 6-port Empty Cassette	16	EA	100.00	1,600	50	800	2,400	360	2,760
Telecom Room - Electrical Improvements	1	EA	4,000.00	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500.00	7,500	1,500	1,500	9,000	1,350	10,350

telecommunications **cost opinion**

Building 16 - Power Plant

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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
Pathway per Drop	13	EA	200.00	2,600	150	1,950	4,550	683	5,233
Subtotal Low-Voltage Systems (Divisions 27)							86,486	12,973	99,459
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138.02	138	276	276	414	62.11	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280.40	280			280	42.06	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200.00	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800.00	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535.00	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100.00	100	50	50	150	23	173
Card Reader	1	EA	325.00	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800.00	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125.00	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400.00	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 18 - Old Commissary

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	3,953.65	3,954	7,907	7,907	11,861	1,779	13,640
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	5,014.88	5,015			5,015	752	5,767
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Telecommunications Rooms - HC	1	EA	12,000.00	12,000	2,500	2,500	14,500	2,175	16,675
Adaptor Plates - LC ACP	4	EA	150.00	600	50	200	800	120	920
Rack Mount Fiber Cabinet - 2RU	1	EA	300.00	300	110	110	410	62	472
Ladder Rack	60	LF	7.50	450	20	1,200	1,650	248	1,898
2000VA UPS	1	EA	3,000.00	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 Singlemode Outside Plant (OSP) OFC	700	LF	2.50	1,750		35	1,785	268	2,053
12 Strand Multimode Outside Plant (OSP) OFC	700	LF	1.19	832		35	867	130	997
Trenching	400	LF	7.50	3,000	15	6,000	9,000	1,350	10,350
(4)4"C w/ 3" 3-Cell Textile Innerduct	650	LF	61.40	39,910	71	46,150	86,060	12,909	98,969

telecommunications **cost opinion**

Building 18 - Old Commissary

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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
Utility Vault (Medium)	1	EA	4,335.00	4,335	3,500	3,500	7,835	1,175	9,010
Telecommunications Device - 4-Port	10	EA	1,100.00	11,000	474	4,737	15,737	2,361	18,097
Telecommunications Device - 4-Port - Existing	5	EA	1,100.00	5,500	474	2,368	7,868	1,180	9,049
CAT 6A Quickport Connector	80	EA	36.16	2,892	25	2,000	4,892	734	5,626
CAT 6A Quickport Connector - Existing	3	EA	36.16	108	26	78	186	28	214
CAT 6A Patch Panel	1	EA	320.11	320	150	150	470	71	541
Copper 6-port Empty Cassette	8	EA	100.00	800	50	400	1,200	180	1,380
Telecom Room - Electrical Improvements	1	EA	4,000.00	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500.00	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	10	EA	200.00	2,000	150	1,500	3,500	525	4,025
Subtotal Low-Voltage Systems (Divisions 27)							196,247	29,437	225,684
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138.02	138	276	276	414	62.11	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280.40	280			280	42.06	322

telecommunications **cost opinion**

Building 18 - Old Commissary

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

HARGIS
1201 third avenue, ste 600
seattle, washington 98101
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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	200.00	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800.00	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535.00	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100.00	100	50	50	150	23	173
Card Reader	1	EA	325.00	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800.00	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125.00	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400.00	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 29 - Maintenance Shop

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	6,189.22	6,189	12,378	12,378	18,568	2,785	21,353
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	6,841.56	6,842			6,842	1,026	7,868
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Telecommunications Rooms - HC	1	EA	12,000.00	12,000	2,500	2,500	14,500	2,175	16,675
Adaptor Plates - LC ACP	4	EA	150.00	600	50	200	800	120	920
Rack Mount Fiber Cabinet - 2RU	1	EA	300.00	300	110	110	410	62	472
Ladder Rack	40	LF	7.50	300	20	800	1,100	165	1,265
2000VA UPS	1	EA	3,000.00	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 Singlemode Outside Plant (OSP) OFC	1,300	LF	2.50	3,250		65	3,315	497	3,812
12 Strand Multimode Outside Plant (OSP) OFC	1,300	LF	1.19	1,544		65	1,609	241	1,851
Trenching	700	LF	7.50	5,250	15	10,500	15,750	2,363	18,113
(4)4"C w/ 3" 3-Cell Textile Innerduct	1,250	LF	61.40	76,750	71	88,750	165,500	24,825	190,325
Utility Vault (Medium)	1	EA	4,335.00	4,335	3,500	3,500	7,835	1,175	9,010

telecommunications **cost opinion**

Building 29 - Maintenance Shop

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	8	EA	1,100.00	8,800	474	3,789	12,589	1,888	14,478
Telecommunications Device - 4-Port - Existing	3	EA	1,100.00	3,300	474	1,421	4,721	708	5,429
CAT 6A Quickport Connector	64	EA	36.16	2,314	25	1,600	3,914	587	4,501
CAT 6A Quickport Connector - Existing	24	EA	36.16	868	26	624	1,492	224	1,716
CAT 6A Patch Panel	1	EA	320.11	320	150	150	470	71	541
Copper 6-port Empty Cassette	8	EA	100.00	800	50	400	1,200	180	1,380
Telecom Room - Electrical Improvements	1	EA	4,000.00	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500.00	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	8	EA	200.00	1,600	150	1,200	2,800	420	3,220
Subtotal Low-Voltage Systems (Divisions 27)							286,025	42,904	328,929
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138.02	138	276	276	414	62.11	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280.40	280			280	42.06	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200.00	200	200	200	400	60	460

telecommunications **cost opinion**

Building 29 - Maintenance Shop

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	2,800.00	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535.00	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100.00	100	50	50	150	23	173
Card Reader	1	EA	325.00	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800.00	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125.00	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400.00	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 30 - Olympic

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	2,809.52	2,810	5,619	5,619	8,429	1,264	9,693
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	5,969.37	5,969			5,969	895	6,865
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Telecommunications Rooms - HC	1	EA	12,000.00	12,000	2,500	2,500	14,500	2,175	16,675
Adaptor Plates - LC ACP	4	EA	150.00	600	50	200	800	120	920
Rack Mount Fiber Cabinet - 2RU	1	EA	300.00	300	110	110	410	62	472
Ladder Rack	60	LF	7.50	450	20	1,200	1,650	248	1,898
2000VA UPS	1	EA	3,000.00	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 Singlemode Outside Plant (OSP) OFC	1,650	LF	2.50	4,125		83	4,208	631	4,839
12 Strand Multimode Outside Plant (OSP) OFC	1,650	LF	1.19	1,960		83	2,043	306	2,349
Telecommunications Device - 4-Port	45	EA	1,100.00	49,500	474	21,315	70,815	10,622	81,438
Telecommunications Device - 4-Port - Existing	6	EA	1,100.00	6,600	474	2,842	9,442	1,416	10,858
CAT 6A Quickport Connector	360	EA	36.16	13,016	25	9,000	22,016	3,302	25,319
CAT 6A Quickport Connector - Existing	48	EA	36.16	1,735	26	1,248	2,983	448	3,431
CAT 6A Patch Panel	5	EA	320.11	1,601	150	750	2,351	353	2,703
Copper 6-port Empty Cassette	40	EA	100.00	4,000	50	2,000	6,000	900	6,900
Telecom Room - Electrical Improvements	1	EA	4,000.00	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500.00	7,500	1,500	1,500	9,000	1,350	10,350

telecommunications **cost opinion**

Building 30 - Olympic

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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
Pathway per Drop	45	EA	200.00	9,000	150	6,750	15,750	2,363	18,113
Subtotal Low-Voltage Systems (Divisions 27)							189,976	28,496	218,472
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138.02	138	276	276	414	62.11	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280.40	280			280	42.06	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200.00	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800.00	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535.00	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100.00	100	50	50	150	23	173
Card Reader	1	EA	325.00	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800.00	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125.00	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400.00	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 31 - Rainier

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	2,809.77	2,810	5,620	5,620	8,429	1,264	9,694
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	5,978.59	5,979			5,979	897	6,875
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Telecommunications Rooms - HC	1	EA	12,000.00	12,000	2,500	2,500	14,500	2,175	16,675
Adaptor Plates - LC ACP	4	EA	150.00	600	50	200	800	120	920
Rack Mount Fiber Cabinet - 2RU	1	EA	300.00	300	110	110	410	62	472
Ladder Rack	60	LF	7.50	450	20	1,200	1,650	248	1,898
2000VA UPS	1	EA	3,000.00	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 Singlemode Outside Plant (OSP) OFC	1,700	LF	2.50	4,250		85	4,335	650	4,985
12 Strand Multimode Outside Plant (OSP) OFC	1,700	LF	1.19	2,020		85	2,105	316	2,420
Telecommunications Device - 4-Port	45	EA	1,100.00	49,500	474	21,315	70,815	10,622	81,438
Telecommunications Device - 4-Port - Existing	6	EA	1,100.00	6,600	474	2,842	9,442	1,416	10,858
CAT 6A Quickport Connector	360	EA	36.16	13,016	25	9,000	22,016	3,302	25,319
CAT 6A Quickport Connector - Existing	48	EA	36.16	1,735	26	1,248	2,983	448	3,431
CAT 6A Patch Panel	5	EA	320.11	1,601	150	750	2,351	353	2,703
Copper 6-port Empty Cassette	40	EA	100.00	4,000	50	2,000	6,000	900	6,900
Telecom Room - Electrical Improvements	1	EA	4,000.00	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500.00	7,500	1,500	1,500	9,000	1,350	10,350

telecommunications **cost opinion**

Building 31 - Rainier

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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1201 third avenue, ste 600
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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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
Pathway per Drop	45	EA	200.00	9,000	150	6,750	15,750	2,363	18,113
Subtotal Low-Voltage Systems (Divisions 27)							190,175	28,526	218,701
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138.02	138	276	276	414	62.11	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280.40	280			280	42.06	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200.00	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800.00	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535.00	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100.00	100	50	50	150	23	173
Card Reader	1	EA	325.00	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800.00	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125.00	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400.00	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 32 - Pacific

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	2,809.27	2,809	5,619	5,619	8,428	1,264	9,692
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	5,960.15	5,960			5,960	894	6,854
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Telecommunications Rooms - HC	1	EA	12,000.00	12,000	2,500	2,500	14,500	2,175	16,675
Adaptor Plates - LC ACP	4	EA	150.00	600	50	200	800	120	920
Rack Mount Fiber Cabinet - 2RU	1	EA	300.00	300	110	110	410	62	472
Ladder Rack	60	LF	7.50	450	20	1,200	1,650	248	1,898
2000VA UPS	1	EA	3,000.00	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 Singlemode Outside Plant (OSP) OFC	1,600	LF	2.50	4,000		80	4,080	612	4,692
12 Strand Multimode Outside Plant (OSP) OFC	1,600	LF	1.19	1,901		80	1,981	297	2,278
Telecommunications Device - 4-Port	45	EA	1,100.00	49,500	474	21,315	70,815	10,622	81,438
Telecommunications Device - 4-Port - Existing	6	EA	1,100.00	6,600	474	2,842	9,442	1,416	10,858
CAT 6A Quickport Connector	360	EA	36.16	13,016	25	9,000	22,016	3,302	25,319
CAT 6A Quickport Connector - Existing	48	EA	36.16	1,735	26	1,248	2,983	448	3,431
CAT 6A Patch Panel	5	EA	320.11	1,601	150	750	2,351	353	2,703
Copper 6-port Empty Cassette	40	EA	100.00	4,000	50	2,000	6,000	900	6,900
Telecom Room - Electrical Improvements	1	EA	4,000.00	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500.00	7,500	1,500	1,500	9,000	1,350	10,350

telecommunications **cost opinion**

Building 32 - Pacific

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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seattle, washington 98101
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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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
Pathway per Drop	45	EA	200.00	9,000	150	6,750	15,750	2,363	18,113
Subtotal Low-Voltage Systems (Divisions 27)							189,776	28,466	218,243
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138.02	138	276	276	414	62.11	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280.40	280			280	42.06	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200.00	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800.00	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535.00	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100.00	100	50	50	150	23	173
Card Reader	1	EA	325.00	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800.00	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125.00	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400.00	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 33 - Baker & Chelan

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	4,549.53	4,550	9,099	9,099	13,649	2,047	15,696
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	9,095.30	9,095			9,095	1,364	10,460
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Adaptor Plates - LC ACP	8	EA	150.00	1,200	50	400	1,600	240	1,840
Rack Mount Fiber Cabinet - 2RU	2	EA	300.00	600	110	220	820	123	943
Ladder Rack	120	LF	7.50	900	20	2,400	3,300	495	3,795
2000VA UPS	2	EA	3,000.00	6,000	110	220	6,220	933	7,153
Demolish Defunct Infrastructure After System Cutover	1	LS			4,000	4,000	4,000	600	4,600
12 Strand Singlemode Outside Plant (OSP) OFC	600	LF	2.50	1,500		30	1,530	230	1,760
12 Strand Multimode Outside Plant (OSP) OFC	600	LF	1.19	713		30	743	111	854
Telecommunications Device - 4-Port	70	EA	1,100.00	77,000	474	33,157	110,157	16,524	126,681
Telecommunications Device - 4-Port - Existing	20	EA	1,100.00	22,000	474	9,473	31,473	4,721	36,194
CAT 6A Quickport Connector	560	EA	36.16	20,247	25	14,000	34,247	5,137	39,384
CAT 6A Quickport Connector - Existing	160	EA	36.16	5,785	26	4,160	9,945	1,492	11,437
CAT 6A Patch Panel	8	EA	320.11	2,561	150	1,200	3,761	564	4,325
Copper 6-port Empty Cassette	64	EA	100.00	6,400	50	3,200	9,600	1,440	11,040
Telecom Room - Electrical Improvements	2	EA	4,000.00	8,000	2,500	5,000	13,000	1,950	14,950
Telecom Room - HVAC - Ductless Split System	2	EA	7,500.00	15,000	1,500	3,000	18,000	2,700	20,700
Pathway per Drop	70	EA	200.00	14,000	150	10,500	24,500	3,675	28,175
Subtotal Low-Voltage Systems (Divisions 27)							295,640	44,346	339,987

telecommunications **cost opinion**

Building 33 - Baker & Chelan

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	138.02	138	276	276	414	62.11	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280.40	280			280	42.06	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200.00	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800.00	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535.00	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100.00	100	50	50	150	23	173
Card Reader	1	EA	325.00	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800.00	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125.00	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400.00	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 37 - Pharmacy

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	2,340.83	2,341	4,682	4,682	7,022	1,053	8,076
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	5,048.97	5,049			5,049	757	5,806
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Adaptor Plates - LC ACP	4	EA	150.00	600	50	200	800	120	920
Rack Mount Fiber Cabinet - 2RU	1	EA	300.00	300	110	110	410	62	472
2000VA UPS	1	EA	3,000.00	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 Singlemode Outside Plant (OSP) OFC	1,550	LF	2.50	3,875		78	3,953	593	4,545
12 Strand Multimode Outside Plant (OSP) OFC	1,550	LF	1.19	1,841		78	1,919	288	2,207
Telecommunications Device - 4-Port	24	EA	1,100.00	26,400	474	11,368	37,768	5,665	43,433
Telecommunications Device - 4-Port - Existing	26	EA	1,100.00	28,600	474	12,316	40,916	6,137	47,053
CAT 6A Quickport Connector	192	EA	36.16	6,942	25	4,800	11,742	1,761	13,503
CAT 6A Quickport Connector - Existing	208	EA	36.16	7,520	26	5,408	12,928	1,939	14,868
CAT 6A Patch Panel	5	EA	320.11	1,601	150	750	2,351	353	2,703
Copper 6-port Empty Cassette	40	EA	100.00	4,000	50	2,000	6,000	900	6,900
Telecom Room - Electrical Improvements	1	EA	4,000.00	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500.00	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	24	EA	200.00	4,800	150	3,600	8,400	1,260	9,660
Subtotal Low-Voltage Systems (Divisions 27)							159,867	23,980	183,848

telecommunications **cost opinion**

Building 37 - Pharmacy

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	138.02	138	276	276	414	62.11	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280.40	280			280	42.06	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200.00	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800.00	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535.00	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100.00	100	50	50	150	23	173
Card Reader	1	EA	325.00	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800.00	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125.00	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400.00	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 38 - Commissary

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	1,622.17	1,622	3,244	3,244	4,867	730	5,596
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	3,821.08	3,821			3,821	573	4,394
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Telecommunications Rooms - HC	1	EA	12,000.00	12,000	2,500	2,500	14,500	2,175	16,675
Telecommunications Rooms - HC	1	EA	4,500.00	4,500	1,200	1,200	5,700	855	6,555
Adaptor Plates - LC ACP	8	EA	150.00	1,200	50	400	1,600	240	1,840
Rack Mount Fiber Cabinet - 2RU	2	EA	300.00	600	110	220	820	123	943
Ladder Rack	120	LF	7.50	900	20	2,400	3,300	495	3,795
2000VA UPS	2	EA	3,000.00	6,000	110	220	6,220	933	7,153
Telecommunication Room Demolition	1	EA			2,000	2,000	2,000	300	2,300
Demolish Defunct Infrastructure After System Cutover	1	LS			4,000	4,000	4,000	600	4,600
12 Strand Singlemode Outside Plant (OSP) OFC	1,500	LF	2.50	3,750		75	3,825	574	4,399
12 Strand Multimode Outside Plant (OSP) OFC	1,500	LF	1.19	1,782		75	1,857	279	2,136
Telecommunications Device - 4-Port	5	EA	1,100.00	5,500	474	2,368	7,868	1,180	9,049
Telecommunications Device - 4-Port - Existing	9	EA	1,100.00	9,900	474	4,263	14,163	2,124	16,288
CAT 6A Quickport Connector	40	EA	36.16	1,446	25	1,000	2,446	367	2,813
CAT 6A Quickport Connector - Existing	72	EA	36.16	2,603	26	1,872	4,475	671	5,147
CAT 6A Patch Panel	2	EA	320.11	640	150	300	940	141	1,081
Copper 6-port Empty Cassette	16	EA	100.00	1,600	50	800	2,400	360	2,760
Telecom Room - Electrical Improvements	2	EA	4,000.00	8,000	2,500	5,000	13,000	1,950	14,950
Telecom Room - HVAC - Ductless Split System	2	EA	7,500.00	15,000	1,500	3,000	18,000	2,700	20,700

telecommunications **cost opinion**

Building 38 - Commissary

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

HARGIS
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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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
Pathway per Drop	5	EA	200.00	1,000	150	750	1,750	263	2,013
Subtotal Low-Voltage Systems (Divisions 27)							117,553	17,633	135,186
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	209.64	210	419	419	629	94.34	723
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	390.40	390			390	58.56	449
Raceway, Cabling Supports and Outlet Boxes	2	EA	200.00	400	200	400	800	120	920
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800.00	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535.00	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170	170	1,095	164	1,259
Portal Licenses	2	EA	100.00	200	50	100	300	45	345
Card Reader	2	EA	325.00	650	128	255	905	136	1,041
Electrified Hardware (Electrified Lock and Power Transfer)	2	EA	1,800.00	3,600	600	1,200	4,800	720	5,520
Request To Exit (REX)	2	EA	125.00	250	85	170	420	63	483
Wiring - Per Access Control Door	2	EA	400.00	800	700	1,400	2,200	330	2,530
Programming	1	LS			1,952	1,952	1,952	293	2,245
Engineering	1	LS			976	976	976	146	1,122
Subtotal Life Safety and Security Systems (Divisions 28)							18,567	2,785	21,352

telecommunications **cost opinion**

Building 39 - Columbia

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	8,185.64	8,186	16,371	16,371	24,557	3,684	28,240
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	10,888.88	10,889			10,889	1,633	12,522
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Adaptor Plates - LC ACP	4	EA	150.00	600	50	200	800	120	920
Rack Mount Fiber Cabinet - 2RU	1	EA	300.00	300	110	110	410	62	472
Demolish Defunct Infrastructure After System Cutover	1	LS			4,000	4,000	4,000	600	4,600
12 Strand Singlemode Outside Plant (OSP) OFC	1,050	LF	2.50	2,625		53	2,678	402	3,079
12 Strand Multimode Outside Plant (OSP) OFC	1,050	LF	1.19	1,247		53	1,300	195	1,495
Trenching	950	LF	7.50	7,125	15	14,250	21,375	3,206	24,581
(4)4"C w/ 3" 3-Cell Textile Innerduct	950	LF	61.40	58,330	71	67,450	125,780	18,867	144,647
Utility Vault (Medium)	3	EA	4,335.00	13,005	3,500	10,500	23,505	3,526	27,031
Telecommunications Device - 4-Port	62	EA	1,100.00	68,200	474	29,368	97,568	14,635	112,203
Telecommunications Device - 4-Port - Existing	12	EA	1,100.00	13,200	474	5,684	18,884	2,833	21,717
CAT 6A Quickport Connector	496	EA	36.16	17,933	25	12,400	30,333	4,550	34,883
CAT 6A Quickport Connector - Existing	96	EA	36.16	3,471	26	2,496	5,967	895	6,862
CAT 6A Patch Panel	7	EA	320.11	2,241	150	1,050	3,291	494	3,784
Copper 6-port Empty Cassette	56	EA	100.00	5,600	50	2,800	8,400	1,260	9,660
Telecom Room - Electrical Improvements	1	EA	4,000.00	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500.00	7,500	1,500	1,500	9,000	1,350	10,350

telecommunications **cost opinion**

Building 39 - Columbia

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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
Pathway per Drop	62	EA	200.00	12,400	150	9,300	21,700	3,255	24,955
Subtotal Low-Voltage Systems (Divisions 27)							416,936	62,540	479,477
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	209.64	210	419	419	629	94.34	723
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	390.40	390			390	58.56	449
Raceway, Cabling Supports and Outlet Boxes	2	EA	200.00	400	200	400	800	120	920
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800.00	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535.00	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170	170	1,095	164	1,259
Portal Licenses	2	EA	100.00	200	50	100	300	45	345
Card Reader	2	EA	325.00	650	128	255	905	136	1,041
Electrified Hardware (Electrified Lock and Power Transfer)	2	EA	1,800.00	3,600	600	1,200	4,800	720	5,520
Request To Exit (REX)	2	EA	125.00	250	85	170	420	63	483
Wiring - Per Access Control Door	2	EA	400.00	800	700	1,400	2,200	330	2,530
Programming	1	LS			1,952	1,952	1,952	293	2,245
Engineering	1	LS			976	976	976	146	1,122
Subtotal Life Safety and Security Systems (Divisions 28)							18,567	2,785	21,352

telecommunications **cost opinion**

Building 39A - Columbia Portable

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	5,399.50	5,400	10,799	10,799	16,199	2,430	18,628
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	5,482.14	5,482			5,482	822	6,304
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Adaptor Plates - LC ACP	4	EA	150.00	600	50	200	800	120	920
Rack Mount Fiber Cabinet - 2RU	1	EA	300.00	300	110	110	410	62	472
Ladder Rack	30	LF	7.50	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 Singlemode Outside Plant (OSP) OFC	1,350	LF	2.50	3,375		68	3,443	516	3,959
12 Strand Multimode Outside Plant (OSP) OFC	1,350	LF	1.19	1,604		68	1,671	251	1,922
Trenching	950	LF	7.50	7,125	15	14,250	21,375	3,206	24,581
(4)4"C w/ 3" 3-Cell Textile Innerduct	950	LF	61.40	58,330	71	67,450	125,780	18,867	144,647
Utility Vault (Medium)	3	EA	4,335.00	13,005	3,500	10,500	23,505	3,526	27,031
Telecommunications Device - 4-Port	10	EA	1,100.00	11,000	474	4,737	15,737	2,361	18,097
Telecommunications Device - 4-Port - Existing	5	EA	1,100.00	5,500	474	2,368	7,868	1,180	9,049
CAT 6A Quickport Connector	80	EA	36.16	2,892	25	2,000	4,892	734	5,626
CAT 6A Quickport Connector - Existing	40	EA	36.16	1,446	26	1,040	2,486	373	2,859
CAT 6A Patch Panel	2	EA	320.11	640	150	300	940	141	1,081
Copper 6-port Empty Cassette	16	EA	100.00	1,600	50	800	2,400	360	2,760
Pathway per Drop	10	EA	200.00	2,000	150	1,500	3,500	525	4,025
Subtotal Low-Voltage Systems (Divisions 27)							239,313	35,897	275,211

telecommunications **cost opinion**

Building 39A - Columbia Portable

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	138.02	138	276	276	414	62	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280.40	280			280	42	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200.00	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800.00	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535.00	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100.00	100	50	50	150	23	173
Card Reader	1	EA	325.00	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800.00	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125.00	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400.00	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 40 - Cascade

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	8,834.94	8,835	17,670	17,670	26,505	3,976	30,481
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	12,617.81	12,618			12,618	1,893	14,510
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Telecommunications Rooms - HC	1	EA	12,000.00	12,000	2,500	2,500	14,500	2,175	16,675
Adaptor Plates - LC ACP	4	EA	150.00	600	50	200	800	120	920
Rack Mount Fiber Cabinet - 2RU	1	EA	300.00	300	110	110	410	62	472
Ladder Rack	60	LF	7.50	450	20	1,200	1,650	248	1,898
2000VA UPS	1	EA	3,000.00	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 Singlemode Outside Plant (OSP) OFC	1,250	LF	2.50	3,125		63	3,188	478	3,666
12 Strand Multimode Outside Plant (OSP) OFC	1,250	LF	1.19	1,485		63	1,548	232	1,780
Trenching	950	LF	7.50	7,125	15	14,250	21,375	3,206	24,581

telecommunications **cost opinion**

Building 40 - Cascade

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

HARGIS
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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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
(4)4"C w/ 3" 3-Cell Textile Innerduct	950	LF	61.40	58,330	71	67,450	125,780	18,867	144,647
Utility Vault (Medium)	3	EA	4,335.00	13,005	3,500	10,500	23,505	3,526	27,031
Telecommunications Device - 4-Port	65	EA	1,100.00	71,500	474	30,789	102,289	15,343	117,632
Telecommunications Device - 4-Port - Existing	21	EA	1,100.00	23,100	474	9,947	33,047	4,957	38,004
CAT 6A Quickport Connector	520	EA	36.16	18,801	25	13,000	31,801	4,770	36,571
CAT 6A Quickport Connector - Existing	168	EA	36.16	6,074	26	4,368	10,442	1,566	12,009
CAT 6A Patch Panel	8	EA	320.11	2,561	150	1,200	3,761	564	4,325
Copper 6-port Empty Cassette	64	EA	100.00	6,400	50	3,200	9,600	1,440	11,040
Telecom Room - Electrical Improvements	1	EA	4,000.00	4,000	2,500	2,500	6,500	975	7,475
Telecom Room - HVAC - Ductless Split System	1	EA	7,500.00	7,500	1,500	1,500	9,000	1,350	10,350
Pathway per Drop	65	EA	200.00	13,000	150	9,750	22,750	3,413	26,163
Subtotal Low-Voltage Systems (Divisions 27)							468,178	70,227	538,404
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138.02	138	276	276	414	62.11	476

telecommunications **cost opinion**

Building 40 - Cascade

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description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280.40	280			280	42.06	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200.00	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800.00	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535.00	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100.00	100	50	50	150	23	173
Card Reader	1	EA	325.00	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800.00	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125.00	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400.00	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 4 - Health Services

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** August 15, 2024

JOB NUMBER 23188 **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	5,561.72	5,562	11,123	11,123	16,685	2,503	19,188
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	5,977.89	5,978			5,978	897	6,875
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
Adaptor Plates - LC ACP	4	EA	150.00	600	50	200	800	120	920
Rack Mount Fiber Cabinet - 2RU	1	EA	300.00	300	110	110	410	62	472
Ladder Rack	30	LF	7.50	225	20	600	825	124	949
2000VA UPS	1	EA	3,000.00	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 Singlemode Outside Plant (OSP) OFC	1,450	LF	2.50	3,625		73	3,698	555	4,252
12 Strand Multimode Outside Plant (OSP) OFC	1,450	LF	1.19	1,723		73	1,795	269	2,064
Trenching	950	LF	7.50	7,125	15	14,250	21,375	3,206	24,581
(4)4"C w/ 3" 3-Cell Textile Innerduct	950	LF	61.40	58,330	71	67,450	125,780	18,867	144,647
Utility Vault (Medium)	3	EA	4,335.00	13,005	3,500	10,500	23,505	3,526	27,031
Telecommunications Device - 4-Port	8	EA	1,100.00	8,800	474	3,789	12,589	1,888	14,478
Telecommunications Device - 4-Port - Existing	12	EA	1,100.00	13,200	474	5,684	18,884	2,833	21,717
CAT 6A Quickport Connector	64	EA	36.16	2,314	25	1,600	3,914	587	4,501
CAT 6A Quickport Connector - Existing	96	EA	36.16	3,471	26	2,496	5,967	895	6,862
CAT 6A Patch Panel	2	EA	320.11	640	150	300	940	141	1,081
Copper 6-port Empty Cassette	16	EA	100.00	1,600	50	800	2,400	360	2,760

telecommunications **cost opinion**

Building 4 - Health Services

Telecommunications Infrastructure Assessment Recommendations

Maple Lane

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JOB NUMBER 23188 **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
Pathway per Drop	8	EA	200.00	1,600	150	1,200	2,800	420	3,220
Subtotal Low-Voltage Systems (Divisions 27)							253,455	38,018	291,474
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	138.02	138	276	276	414	62.11	476
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	280.40	280			280	42.06	322
Raceway, Cabling Supports and Outlet Boxes	1	EA	200.00	200	200	200	400	60	460
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800.00	2,800	680	680	3,480	522	4,002
Door Controller - 2-Door	1	EA	535.00	535	85	85	620	93	713
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170	170	1,095	164	1,259
Portal Licenses	1	EA	100.00	100	50	50	150	23	173
Card Reader	1	EA	325.00	325	128	128	453	68	520
Electrified Hardware (Electrified Lock and Power Transfer)	1	EA	1,800.00	1,800	600	600	2,400	360	2,760
Request To Exit (REX)	1	EA	125.00	125	85	85	210	32	242
Wiring - Per Access Control Door	1	EA	400.00	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)								1,906	14,611