HARGIS TELECOMMUNICATIONS ASSESSMENT

DSHS

OLYMPIC HERITAGE BEHAVIORAL HEALTH

WA STATE PROJECT NUMBER: 2024-429 N (11)

EXECUTIVE SUMMARY

OVERVIEW

The Olympic Heritage Behavioral Health Facility, acquired in 2023, is a state-operated facility under the administration of the Behavioral Health Administration (BHA) of the Department of Social and Health Services (DSHS). With a capacity for 137 beds, Olympic Heritage is designed to serve people in state psychiatric care. It provides a secure environment with strictly controlled access and monitored movement, ensuring safety and security while offering behavioral health treatment programs. The establishment of this facility is part of the state's commitment to provide space and care for individuals awaiting behavioral health 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

CONSULTING TEAM

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supporting electrical and mechanical systems and compare the existing conditions to current industry standards specific to this facility type. Excluded from the assessment were electronic systems, applications, and hardware, such as the network switches and servers.

The existing campus telecommunications cabling infrastructure includes intra-building optical fiber cabling and twisted-pair copper backbone cabling. This backbone cabling has been installed and modified over a period of years. In most areas, the backbone cabling is antiquated and is unable to support the deployment of new technologies. In one telecom room, the backbone consists of only twisted-pair copper with no optical fiber. The telephony backbone currently consists of Category 3 rated backbone for telephone service. As DSHS transitions toward more advanced technologies, the existing copper backbone is outmoded and should be replaced with new single and multi-mode optical fiber cabling.

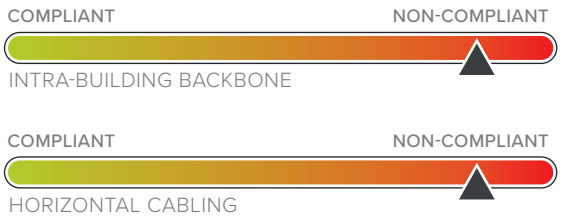
The existing horizontal cabling within the building includes unshielded twisted-pair copper to provide connectivity to computers, telephones, printers, and other network attached devices. The existing cabling consists of Category 3, 5e, 6, and 6A. Category 6A cabling was installed for the Silas timeclocks utilized by DSHS, meeting industry infrastructure standards. The remaining existing Category 3, 5e, and 6 horizontal cabling does not meet current industry infrastructure standards. Based on physical inspection and review of existing documentation, the existing IT infrastructure does not comply with most current industry standards and will not support evolutions to modern and/or future technologies. The existing optical fiber infrastructure, consisting of OM1 62.5-micron multi-mode optical fiber cable, is antiquated and is unable to support the deployment of new technologies. Improving the IP backbone connectivity will be a fundamental component to creating an environment that will permit Olympic Heritage Behavioral Health Facility and DSHS to identify, adapt, and implement new technologies that contribute to safety and operational improvements. New single and multi-mode optical fiber cabling will be required to provide the required backbone capacity.

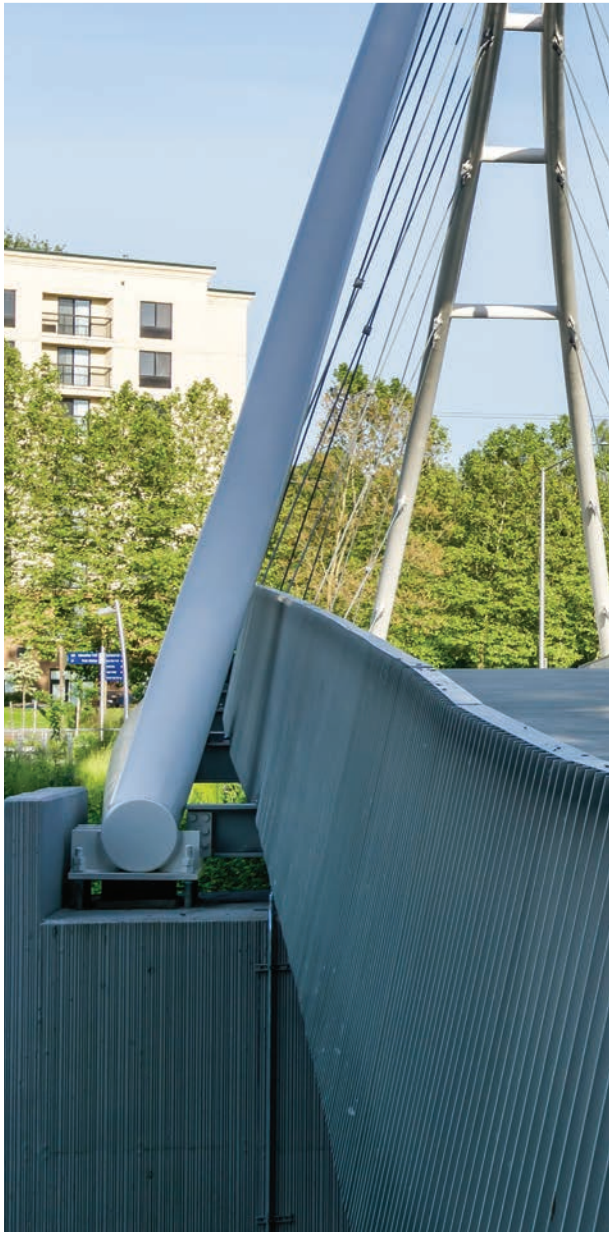
OBJECTIVES

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.

CABLING INFRASTRUCTURE STANDARDS COMPLIANCE





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. Multiple areas throughout the facility were actively undergoing construction and renovation. These areas were not accessible, and therefore not included in this assessment.

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, 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 Olympic Heritage Behavioral Health Facility 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-A 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.

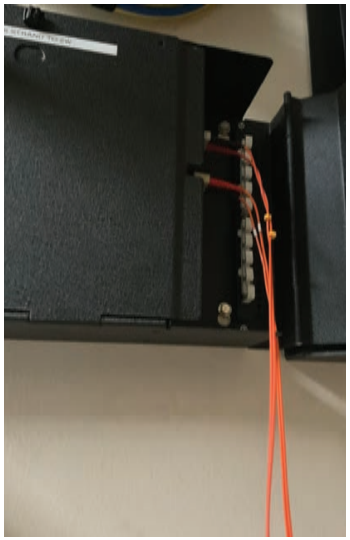
SEQUENCING & RECOMMENDATIONS			
Phase	*Prerequisites*	*Scope*	*ROM Cost Opinion*
RETROFIT EXISTING TELECOMMUNICATIONS SPACES			
1	N/A	» Retrofit Telecommunications Rooms WB04, 112/W108, 121, 158/S147, 2W/W202, 270/S206, 3A/A312, and Penthouse - Demolish any obsolete or non-operational existing equipment to make space. - Provide Electrical Infrastructure (Grounding, UPS, Convenience Receptacles, Equipment Receptacles, Power Distribution Units [PDUs]) - Provide a dedicated 3-ton ductless split system cooling unit in the MER and dedicated 1-ton ductless split system cooling unit for TRs. - Expand existing Access Control, add card reader and electrically locking hardware. - Install Supporting Equipment (Patch Panels, Cable Management, Rack Mount Fiber Cabinets (RMFC), Adaptor plates, Ladder Rack, etc.)	$416,000
INSTALL NEW BACKBONE OFC TO TELECOMMUNICATIONS SPACES			
2	N/A	» Pull 12 st OS2 and 12 st OM4 OFC from first floor TR-158/S147 to MER-112/W108, TR-121, and TR-Penthouse. - Terminate OFC Cabling if RMFC is installed. » Pull 12 st OS2 and 12 st OM4 OFC from second floor TR-2W/W202 to MER-112/W108, TR-121, and TR-270/S206. - Terminate OFC Cabling if RMFC is installed. » Pull 12 st OS2 and 12 st OM4 OFC from second floor TR-270/S206 to TR-3A/A312. - Terminate OFC Cabling if RMFC is installed. » Pull 12 st OS2 and 12 st OM4 OFC from basement floor TR-WB04 to TR-2W/W202 and TR-3A/A312 - Terminate OFC Cabling if RMFC is installed.	$20,000
INSTALL HORIZONTAL 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.	$1,613,000
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.	$301,000
DEMOLISH DEFUNCT INFRASTRUCTURE			
6	1-5	» Demolish OSP cable. - Demolish OM3 Multi-mode Backbone OFC between TRs and MER. - Demolish Copper twisted pair backbone between TR-WB04 and Room W114, TR-2W/W202, TR-3A/A312, and attic. » Demolish Defunct telecommmunications rooms. - Remove any salvageable equipment from TR's. - Remove the remaining equipment and dispose of it.	$44,000

BACKBONE CABLING

Service Provider Connections

Olympic Heritage Behavioral Health has two Internet Service Provider (ISP) connections. One consists of a 6-strand single-mode optical cable for the facility and the second is a 12-strand single-mode optical cable for the King County network. Both connections terminate in TR-158/S147.

The existing phone service provider connection is provided with multiple 100-pair twisted-pair copper backbone cables from the utility to the demarcation point in the TR-WB04.



Existing Fiber Cabinet

Existing OM1 MM OFC

Existing Twisted-Pair Copper Backbone Cabling

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

INTRA-BUILDING BACKBONE CABLING

The existing ethernet network is supported by twisted-pair copper and multi-mode optical fiber backbones between telecom rooms. On the first floor, Equipment Room 112 is linked to two telecom rooms. The first, TR-158/S147, is situated on the building's north side and is connected by a 12-strand OM1 62.5-micron multi-mode optical fiber cable. The second, TR-2W/W202, is located on the west side of the second floor and is connected by a 6-strand OM1 62.5-micron multi-mode optical fiber cable.

TR-158/S147 extends its connectivity to two additional telecom rooms. It connects to TR-121, positioned on the first floor, via a 6-strand and a 12-strand OM1 62.5-micron multi-mode optical fiber cable. It also links to the penthouse-based TR-Penthouse through a 6-strand OM1 62.5-micron multi-mode optical fiber cable.

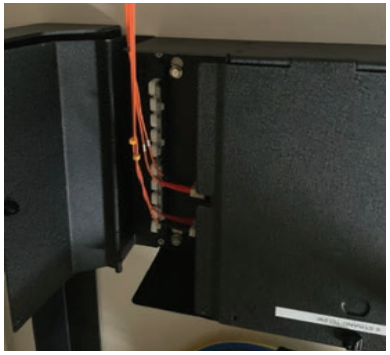
Similarly, TR-2W/W202 establishes connections to two more telecom rooms. It links to TR-121 via a 12-strand OM1 62.5-micron multi-mode optical fiber cable and to TR-270/S206, situated on the south side of the second floor, via another 6-strand OM1 62.5-micron multi-mode optical fiber cable.

Finally, TR-270/S206 extends its connectivity to the third-floor telecom room, TR-3A/A312, through only Category 5e and Category 6 twisted-pair copper.

The current OM1 fiber and twisted-pair copper backbone is extremely limited in bandwidth and data speeds. OM1 fiber is obsolete, is not stocked in warehouses, and is now rarely manufactured. The limited capabilities of the OM1 fiber and twisted-pair copper backbone limit the new technologies that can be introduced at Olympic Heritage Behavioral Health. To meet TIA and industry standards, the backbone fiber cabling and backbone twisted-pair copper cabling should be upgraded to a minimum of OM4 or to single-mode fiber. It is recommended to provide both as a backbone to meet all possible future needs. Providing 12 strands of OS2 single-mode and 12 strands of OM4 multi-mode optical fiber cable will provide a backbone with enough capacity to handle new technologies while still having the capability to support unforeseen future technologies.

The facility also has a voice backbone composed of Category 3 twisted-pair copper. This backbone extends from the TR-WB04 to several locations: room W114 on the first floor, TR-2W/W202, TR-3A/A312, and the attic. From TR-WB04, there are 100-pair twisted pair copper connections extending to both W114 and TR-2W/W202. Additionally, a 50-pair copper extends from TR-WB04 to the attic, and a 400-pair twisted pair copper extends from TR-WB04 to TR-3A/A312.

The Category 3 cabling supporting the voice cabling is inadequate to support new technologies being proposed for implementation at Olympic Heritage Behavioral Health. The voice network should be collapsed to a single converged IP based network, and the existing Category 3 cabling should be demolished.



Existing Fiber Cabinet

Existing OM1 MM OFC

Existing Twisted-Pair Copper 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

Abandoned Phone Outlet

Existing Category 5e & 6 Cabling

Existing 4-Port Switch

Existing Telecom Outlet Box

Existing Biscuit Jack On Floor

Existing Telecom Outlet

VOICE HORIZONTAL CABLING

The existing phone system is a VOIP system utilizing a Category 5e and 6 cabling infrastructure. Upon review, while the voice infrastructure is not standards compliant, it is sufficient to support current voice system needs.

Although the existing Category 5e and 6 infrastructure is currently sufficient, it is not adequate to support advancements in telephony technologies into the future. To comply with aupgraded to Category 6A. Upgrading will allow the cabling infrastructure to support any required technologies going forward.

There is also an unused analog phone system consisting of existing Category 3 cabling which is patched at various points to provide service. The cabling system employs 66 and 110 punchdown blocks for cable termination and interconnection within the structured cabling system. The service enters the building in TR-WB04, patches on building entrance protectors, then patches again from 66 blocks to 110 blocks to be distributed to the appropriate floor. Once on the respective floor, the cable is patched again on 110 blocks to the workstation cabling. The overall effect of multiple patches is a degradation of the signal and introduction of noise, resulting in grainy, poor-quality audio. 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. It is recommended that all Category 3 cabling be removed.

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

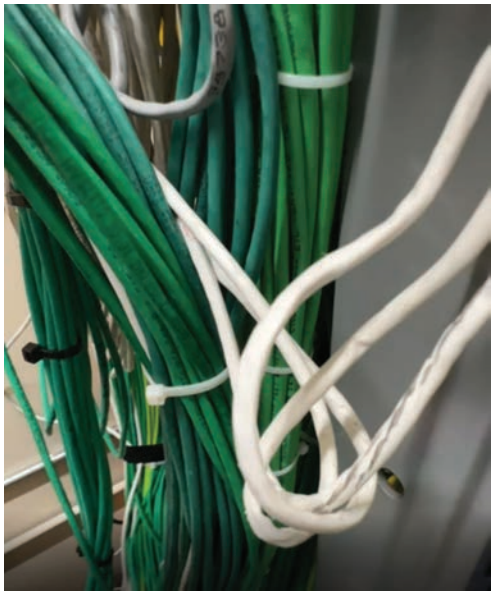
Source: https://learn.microsoft.com/en-us/microsoftteams/prepare-network

ETHERNET HORIZONTAL CABLING

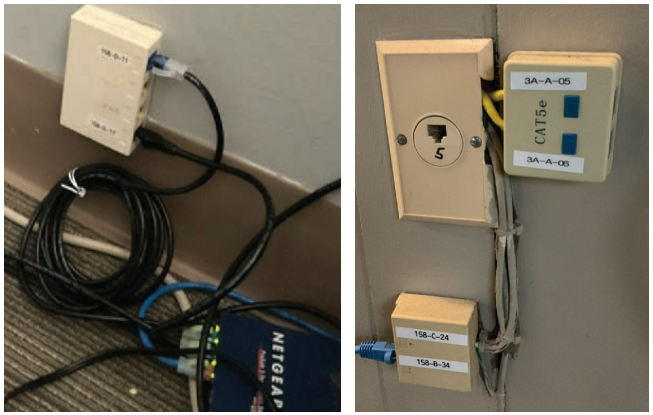
The existing ethernet network is primarily comprised of a mix of Category 5e and 6 cabling. New Category 6A cabling were installed specifically for Silas timeclocks. The existing patch panels, connectors, and patch panels meet Category 5e and 6 standards. Throughout the facility, staff members resort to using small 4-port switches to create additional ports for their devices due to the limited number of data ports in the walls. The addition of these switches can result in bottlenecks in the network and subsequently decrease network throughput. There are also multiple areas where horizontal cables are left dangling from the wall or ceiling without a wall-plate. This not only presents a potential safety hazard but also impacts the performance and reliability of the network connection.

The existing Category 5e and 6 infrastructure is not adequate to meet the current and future needs of Olympic Heritage Behavioral Health. The Category 5e and 6 cabling are also not in compliance with TIA standards for infrastructure in healthcare facilities. It is recommended that the existing cabling infrastructure be replaced with a new Category 6A cabling infrastructure and that additional data ports be added throughout the facility to provide employees with an adequate quantity of network port connections to support required device connections. New cabling infrastructure installation requires cabling to be secured and outlet boxes to be fitted with the appropriate faceplates to protect the cabling.

Meeting TIA-1179 standards will require the entire channel to be Category 6A certified. Meeting this standard 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.

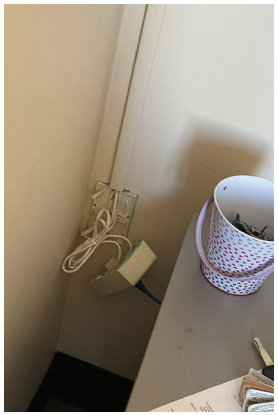


Existing Category 5e & 6 Cabling



Existing 4-Port Switch

Existing Telecom Outlet



Existing Telecom Outlet Box

Existing Biscuit Jack On Floor

TELECOMMUNICATIONS SPACES

The existing telecommunications spaces are not compliant with current standards. 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 modify the telecommunications rooms. Some recommended upgrades include installation of Category 6A patch panels and standards compliant grounding systems. To comply with the Health Insurance Portability and Accountability Act (HIPAA) and current telecommunications standards, controlled 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 facility 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 with 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.

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

EQUIPMENT ROOM 112/W108

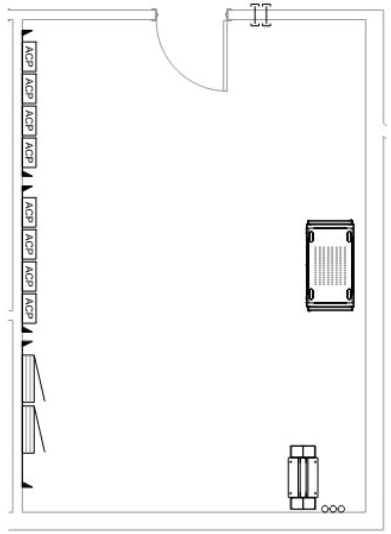
MAIN EQUIPMENT ROOM

The Main Equipment Room for Olympic Heritage Behavioral Health is on the first floor. One wall contains access control panels and power supplies. There are two racks in the room, one primarily for security and the other for horizontal cabling terminations and patching. The security rack contains 24-port and 48-port Category 5e patch panels for WAPs and cameras. The remainder of the equipment in this rack is for security. The telecom rack contains a fiber patch panel for a 6-strand OM1 multi-mode OFC and a 12-strand OM1 multi-mode OFC. It also houses multiple 24-port and 48-port Category 5e patch panels. The room is served by a 6-strand OM1 multi-mode OFC to TR-2W/W202 on the second floor and a 12-strand OM1 multi-mode OFC to TR-158/S147.

There is currently space for expansion on the rack, as well as space for adding additional racks in the room. There is no telecommunications grounding bus bar present in the room. There is cooling and humidity control present in the room. There are a few convenience receptacles, but no dedicated equipment receptacles. UPS power is available to provide clean, uninterrupted power for the equipment. The room can be locked but there is no other access control on the room.

To meet industry standards, it is recommended to provide a ladder rack for cable support. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. New standards compliant backbone and horizontal cabling are recommended. The addition of card-based access control is recommended to control access and track access to the space.

Existing Telecom Room



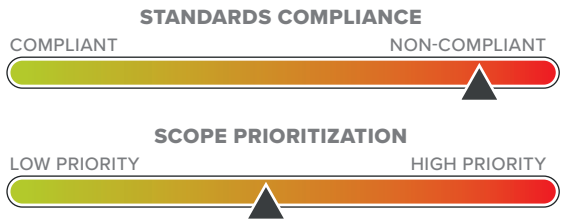
TR-121 Floor Plan

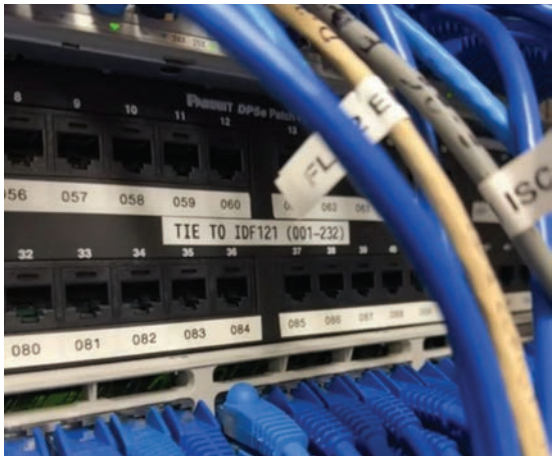
Deficiencies:

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

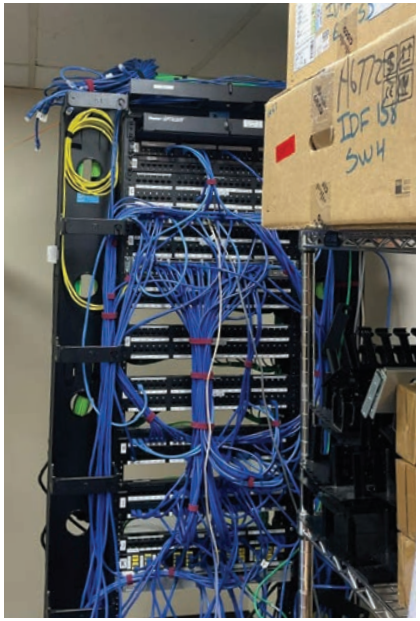
Recommendations:

- Upgrade existing port locations to Category 6A.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone to TR-158/S147 and TR-2W/W202.
- Add ladder tray and cable management as needed.
- Add Telecommunications Grounding Busbar.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals





Existing Category 5e Patch Panel



Existing Telecom Rack 2

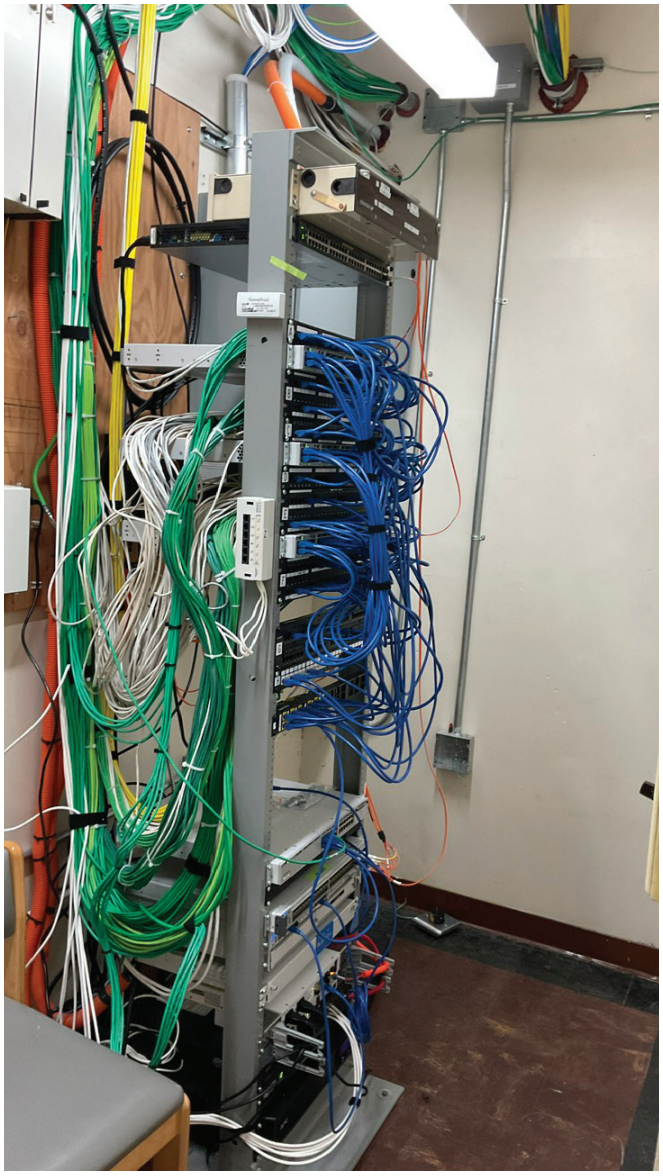
Existing Security Panels

TELECOM ROOM 158/S147 - TR-158/S147

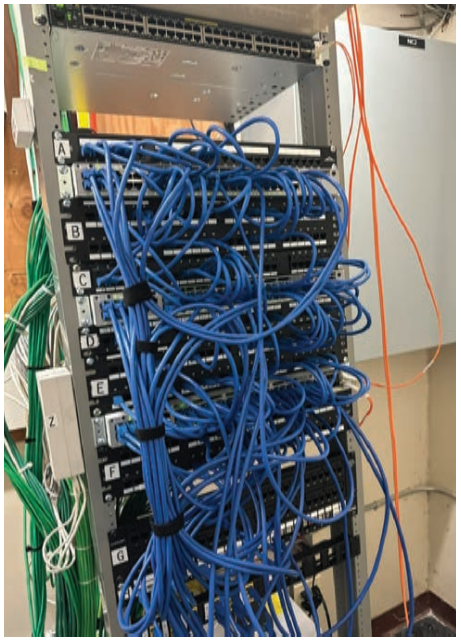
The Telecom Room 158/S147 for Olympic Heritage Behavioral Health is located on the south side of the first floor. One wall contains multiple wall-mounted fiber cabinets, including the service provider connection. There is a 6-strand single-mode optical cable from the service provider that terminates onto a wall-mounted fiber cabinet. There is also a 12-strand single-mode optical cable from the King County network that also terminates onto a wall-mounted fiber cabinet. In addition, there is an unused 6-strand single-mode optical cable labeled from “Healthpoint”.

There is a single rack in the room for horizontal cabling terminations and patching. The telecom rack contains a fiber patch panel for a 12-strand OM1 multi-mode OFC and two 6-strand OM1 multi-mode OFC. It also houses multiple 24-port and 48-port Category 5, Category 5e, Category 6, and Category 6A patch panels. The room is served by a 12-strand OM1 multi-mode OFC to ER-112/W108, a 6-strand OM1 multi-mode OFC to TR-Penthouse in the penthouse, as well as a 6-strand and a 12-strand OM1 multi-mode OFC to TR-121. The OFC to ER-112/W108 terminates on a wall-mounted fiber cabinet, while the OFC to TR-Penthouse and TR-121 terminate in the rack-mounted fiber cabinet.

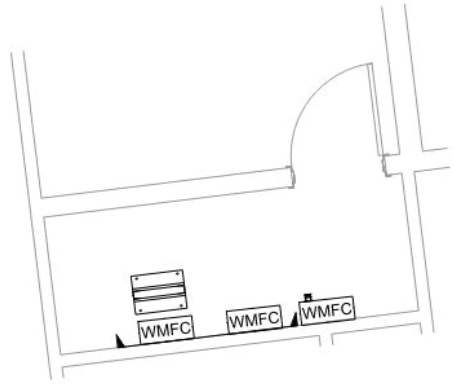
There is currently space for expansion on the rack, as well as space for adding additional racks in the room. There is a grounding bus bar in the room, but the size of the bus bar does not meet industry standards. The bus bar is also not bonded to the telecom equipment. There is cooling and humidity control present in the room. There are a few convenience receptacles, but no dedicated equipment receptacles. UPS power is available to provide clean, uninterrupted power for the equipment. The room can be locked but there is no other access control on the room.



Existing Telecom Rack



Existing Data Patching



TR-158 Floor Plan

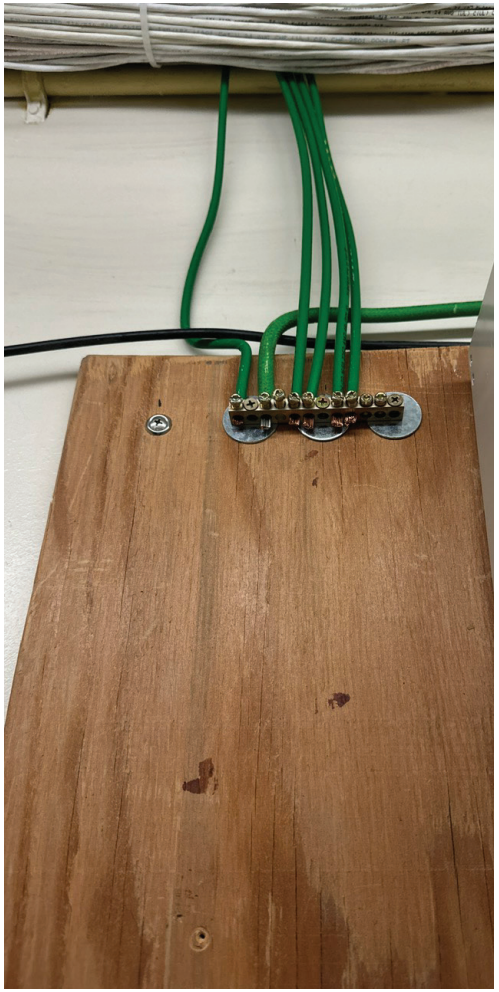
To meet industry standards, it is recommended to provide a ladder rack for cable support. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. New standards compliant backbone and horizontal cabling are recommended. The addition of card-based access control is recommended to control access 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 overhead ladder tray for cable support, leading to cables being draped or placed directly on equipment.
- Inadequate grounding busbar for the telecommunications equipment.
- Equipment is not bonded to the Telecommunications Grounding Busbar.
- Electrical infrastructure does not meet minimum requirements per standards.
- Uncontrolled access to space with no identity verification

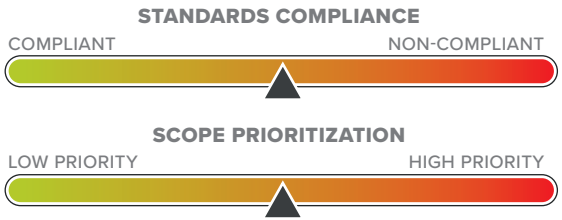
Recommendations:

- Upgrade existing port locations to Category 6A.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone to ER-112/W108, TR-121, and TR-Penthouse.
- Add ladder tray and cable management as needed.
- Add Telecommunications Grounding Busbar and bond to telecom equipment.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.



Existing Grounding

Existing Healthpoint Fiber



TELECOM ROOM 121 - TR-121

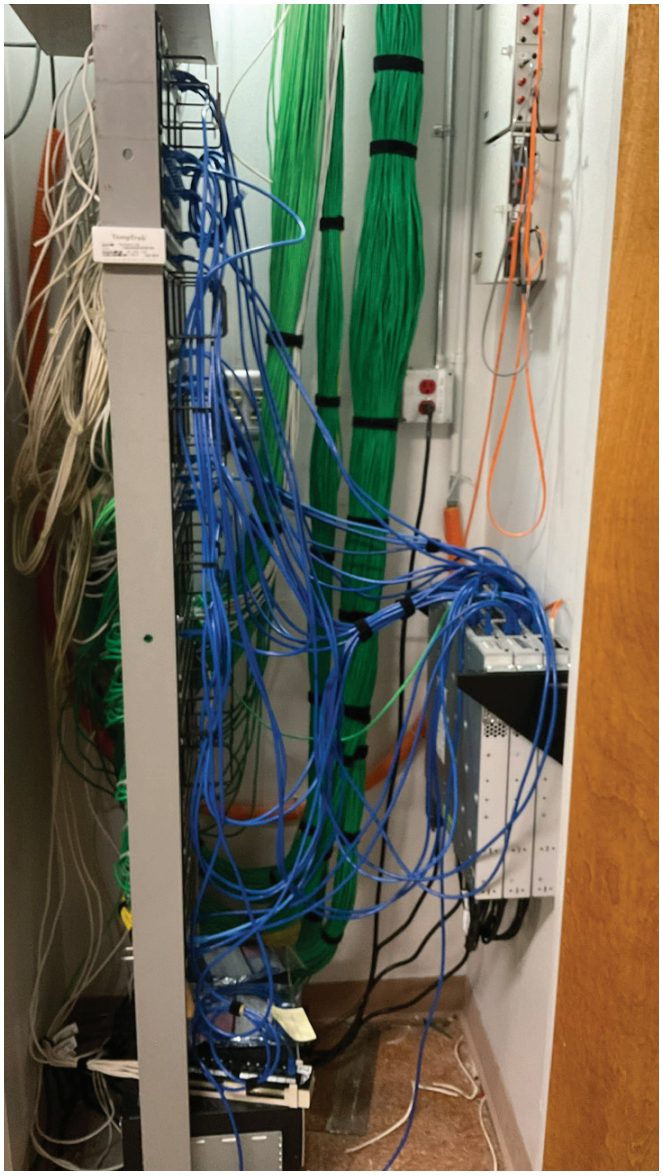
The Telecom Room 121 for Olympic Heritage Behavioral Health is a small 7 sq-ft closet on the first floor. One wall contains two wall-mounted fiber cabinets, along with a wall-mounting bracket for Ethernet switches.

There is a single rack in the closet for horizontal cabling terminations and patching. The telecom rack contains a fiber patch panel for a 6-strand OM1 multi-mode. It also houses multiple 24-port and 48-port Category 5e patch panels.

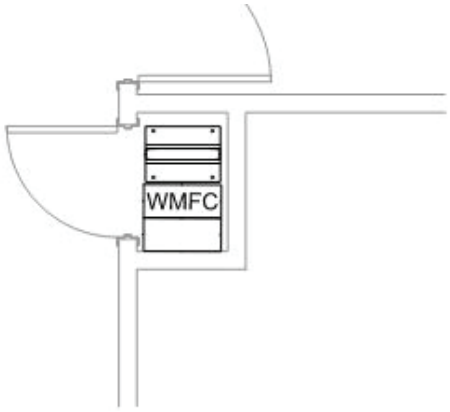
The room is served by a 12-strand OM1 multi-mode OFC to TR-2W/W202, as well as a 6-strand and a 12-strand OM1 multi-mode OFC to TR-121. The OFC to TR-121 terminates on a wall-mounted fiber cabinet, while the OFC to TR-2W/W202 terminate in the rack-mounted fiber cabinet.

This is not an adequate location for the equipment, and it does not meet TIA standards. There is no space for expansion on the rack and due to the small size of the closet, there is also no space for adding additional racks. There is no grounding bus bar in the room. The closet does not contain cooling or humidity control. There is only one convenience receptacle, and it is not a dedicated equipment receptacle. UPS power is available to provide clean, uninterrupted power for the equipment. The room can be locked but there is no other access control on the room.

The telecommunications equipment should be moved to a new, larger, standards compliant telecommunications room.



Existing Telecom Room



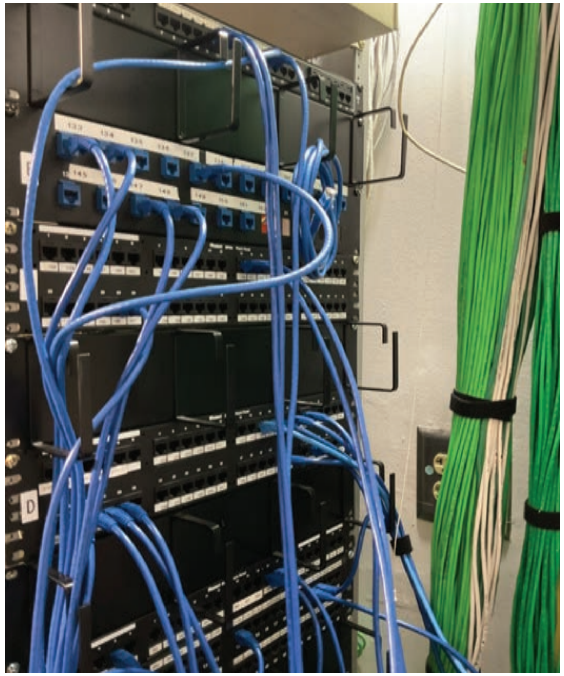
TR-121 Floor Plan

Deficiencies:

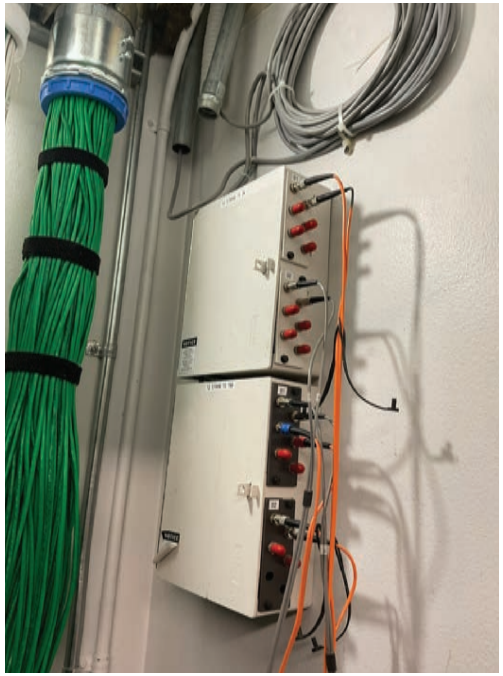
- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- No overhead ladder tray for cable support, leading to cables being draped or placed directly on equipment.
- No grounding busbar for the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

Recommendations:

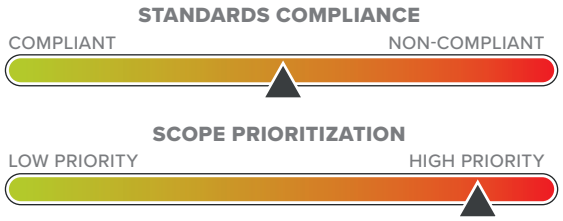
- Abandon the closet and move telecommunications equipment to room W122.
  See Room W122 – Future TR later in this document



Existing Data Patching



Existing Fiber Patching



ROOM 122 - FUTURE TR

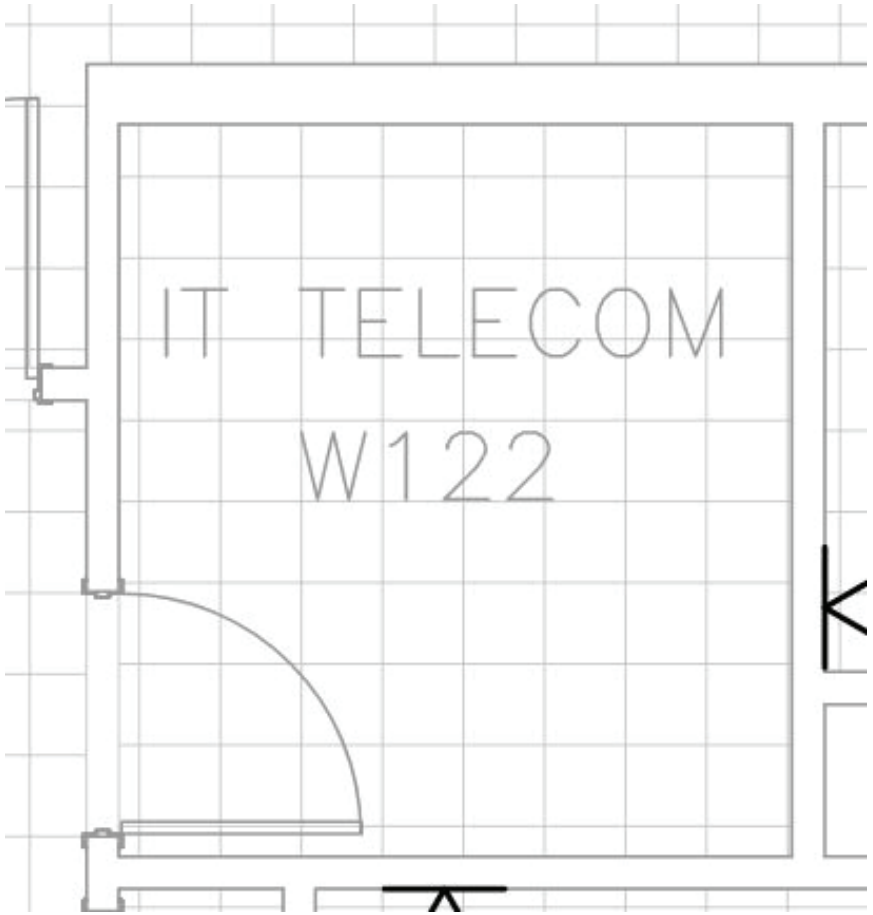
This room is adjacent to the current Telecom Room 121 and is currently being used as a storage room. It is recommended to turn this room into a new telecom room to replace the current Telecom Room 121. To meet industry standards for a telecom room, ladder racks for cable support should be provided. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. New standards compliant backbone and horizontal cabling are recommended. The addition of card-based access control is recommended to control access and track access to the space. Installing a ductless split-system cooling unit is recommended to provide adequate cooling in the room.

Deficiencies:

- Not currently used as a telecommunications room.
- No telecom infrastructure in the room
- Electrical infrastructure does not meet minimum requirements per standards.
- No dedicated cooling system.
- No verification of person's accessing the space.

Recommendations:

- Utilize room as a telecommunications room to replace Telecom Room 121.
- Add racks, ladder tray, cable management as needed.
- Add Telecommunications Grounding Busbar.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone, each to TR-2W/W202, and TR-158/S147.
- Add power circuits and receptacles as needed.
- Add ductless split-system cooling unit.
- Control access to authorized individuals.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Upgrade existing port locations to Category 6A.



W122 Floor Plan

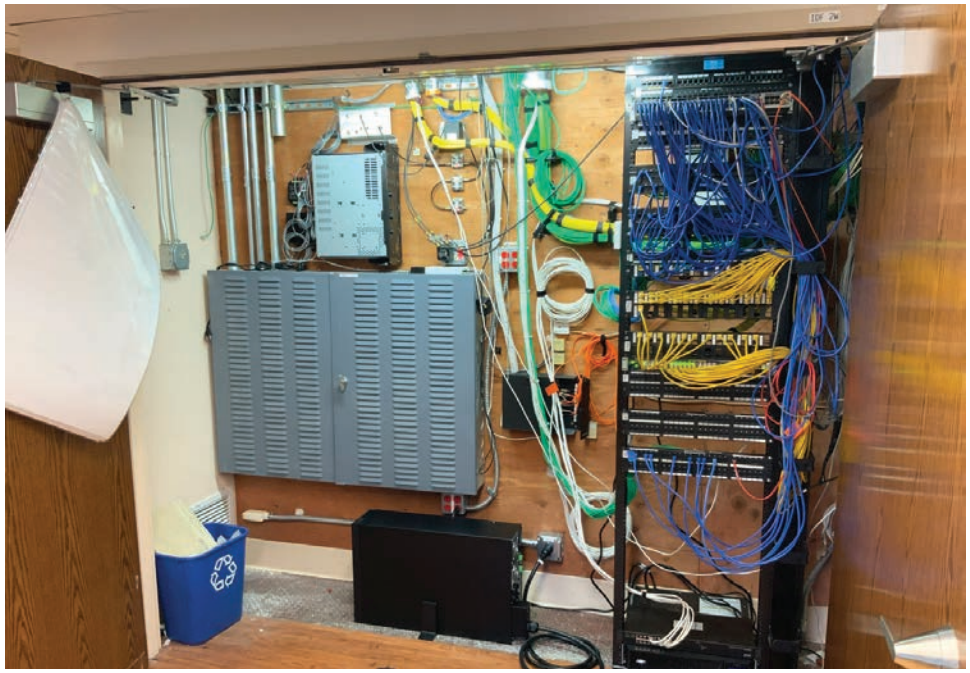
TELECOM ROOM 2W/W202 - TR-2W/W202

Telecom Room 2W/W202 is a small 25 sq-ft closet on the second floor. One wall contains two wall-mounted fiber cabinets, electrical panels, and unused paging equipment, while the other contains 110-blocks for voice cross-connects.

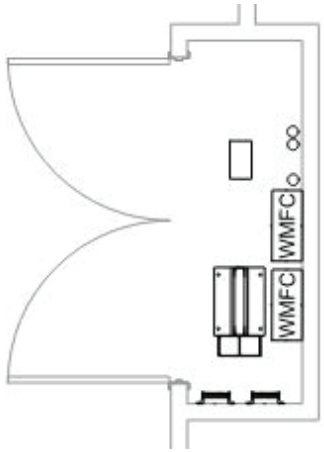
There is a single rack in the closet for horizontal cabling terminations and patching. It supports multiple 24-port and 48-port Category 5e patch panels and Category 6A patch panels. The room is served by a 6-strand OM1 multi-mode OFC to ER-112/W108, a 6-strand OM1 multi-mode OFC to TR-270/S206, and a 12-strand OM1 multi-mode OFC to TR-121. All OFC to this room terminates in the wall-mounted fiber cabinets. Voice infrastructure is supported by a 100-pair Category 3 cable from TR-WB04 that terminates on 110-block.

Space for expansion is present in the existing rack, but due to the small size of the closet, there is no room for adding additional racks. There is no telecommunications grounding bus bar present. The space does not contain cooling or humidity control. There are a few convenience receptacles, but no dedicated equipment receptacles. UPS power is available to provide clean, uninterrupted power for the equipment. The room can be locked but there is no other access control on the room.

To meet industry standards, it is recommended to provide a ladder rack for cable support. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. New standards compliant backbone and horizontal cabling are recommended. The addition of card-based access control is recommended to control access and track access to the space. Ductless split-system cooling unit is also recommended to be installed to provide adequate cooling in the room.



Existing Telecom Room



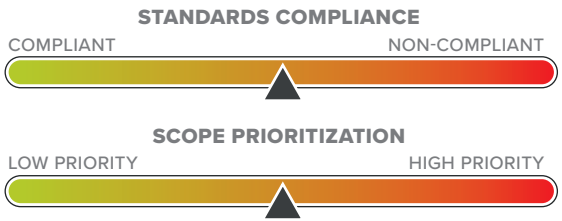
TR-2W Floor Plan

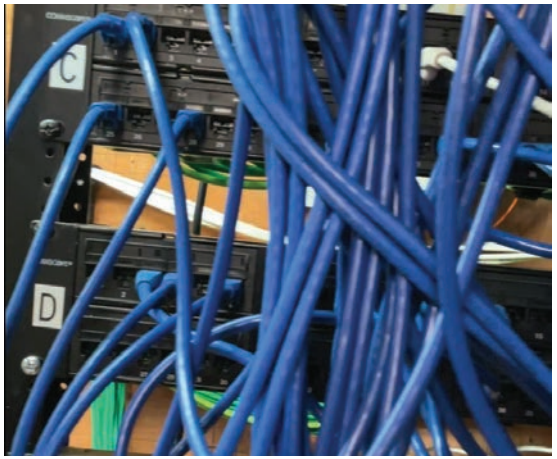
Deficiencies:

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

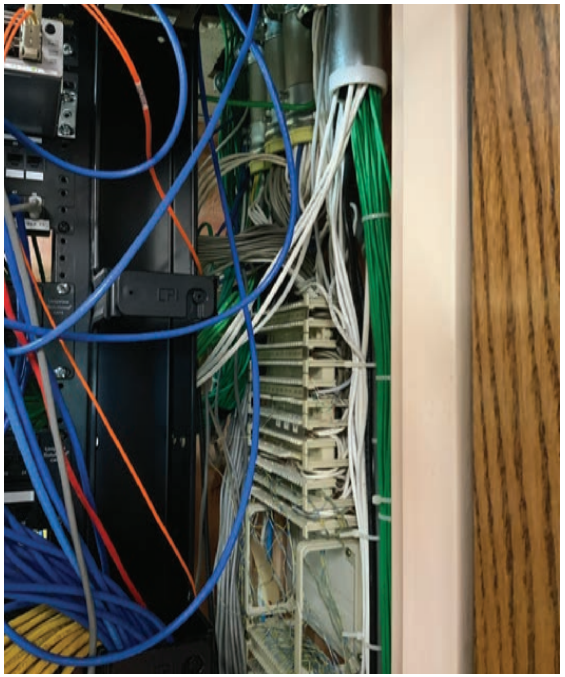
Recommendations:

- Upgrade existing port locations to Category 6A.
- Add additional Category 6A 8P8C RJ45 ports to meet standards.
- Provide new 12-strand OS2 single-mode and 12-strand OM4 multi-mode optical fiber backbone from ER-112/W108, TR-121, and TR-270/S206.
- Add ladder tray and cable management as needed.
- Add Telecommunications Grounding Busbar.
- Add power circuits and receptacles as needed.
- Add ductless split-system cooling unit.
- Control access to authorized individuals.
- Remove unused equipment.





Existing Data Patching



Existing Voice Patching

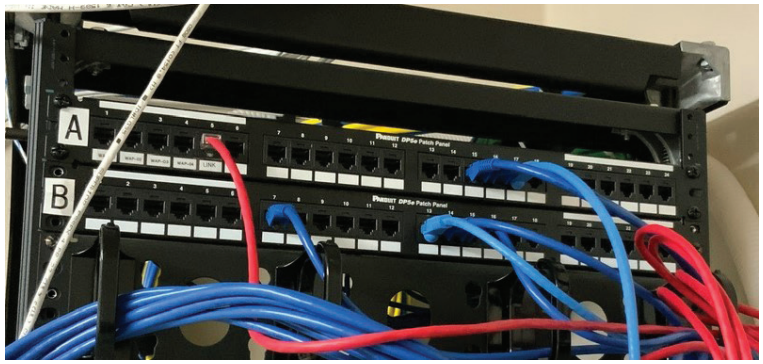
Existing Fiber Patching

TELECOM ROOM 270/S206 - TR-270/S206

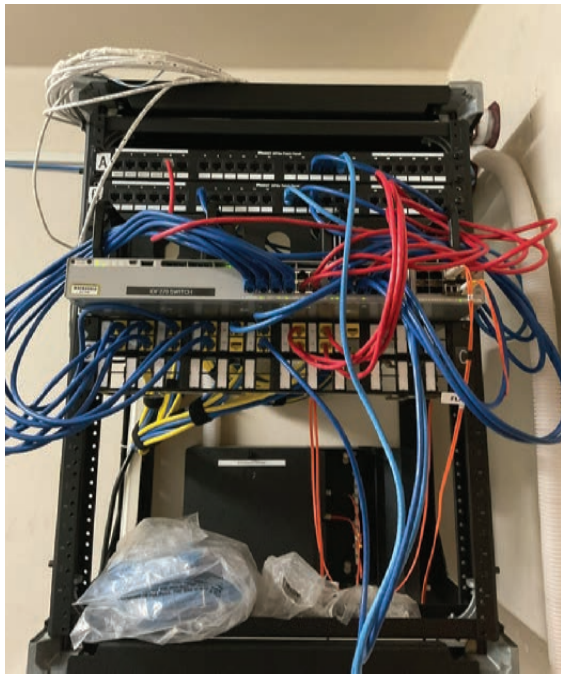
Telecom Room 270/S206 is located in the south side of the second floor. There is a wall-mounted rack and a wall-mounted fiber cabinet behind the rack. The single wall-mounted rack contains horizontal cabling terminations and patching. It also houses multiple 24-port Category 5e and Category 6 patch panels. The room is served by a 6-strand OM1 multi-mode OFC to TR-2W/W202, as well as multiple Category 5e cables to TR-3A/A312.

The wall-mounted rack and fiber cabinet are mounted directly above a sink and behind the swing of the door. There is limited space for expansion on the rack, and there is also room for adding additional wall-mounted and floor standing racks. There is no grounding bus bar in the room. The room does not contain cooling or humidity control. There are a few convenience receptacles, but no dedicated equipment receptacles. UPS backed power is not available. The room can be locked but there is no other access control on the room.

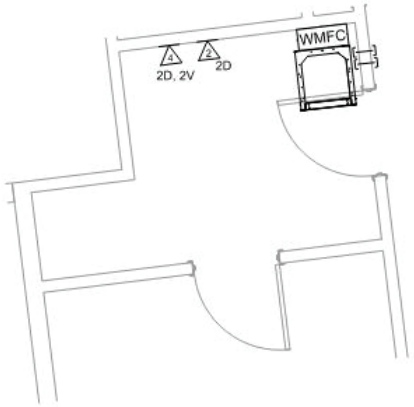
To meet industry standards, it is recommended to provide ladder racks for cable support. A new floor-standing rack should be installed to provide better organization and space for future growth. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. New standards compliant backbone and horizontal cabling are recommended. The addition of card-based access control is recommended to control access and track access to the space. Ductless split-system cooling unit is also recommended to be installed to provide adequate cooling in the room.



Existing Data Patching



Existing Telecom Rack



TR-270 Floor Plan

Deficiencies:

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

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

» No overhead ladder tray for cable support, leading to cables being draped or placed directly on equipment.

» No grounding busbar for the telecommunications equipment.

» Electrical infrastructure does not meet minimum requirements per standards.

» Uncontrolled access to space with no identity verification.

» No dedicated cooling equipment.

» Telecom equipment is mounted directly above a sink, creating a risk of water damage to the equipment in the event of water breaks.

» Telecom rack is mounted directly behind the door swing, creating a risk of damage to equipment if the door is swung open too far.

Recommendations:

» Upgrade existing port locations to Category 6A.

» 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 TR-2W/W202 and TR-3A/A312.

» Add ladder tray and cable management as needed.

» Add Telecommunications Grounding Busbar.

» Add power circuits and receptacles as needed.

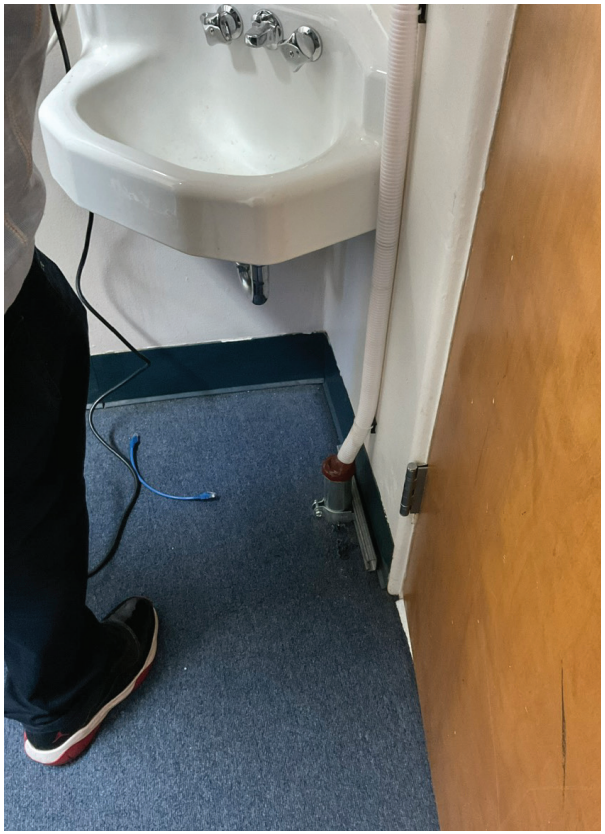
» Add ductless split-system cooling unit.

» Control access to authorized individuals.

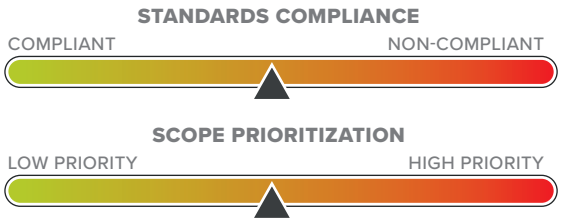
» Provide new two-post equipment rack away from the door and sink.

» Relocate existing telecom equipment from wall-mounted rack to new rack to allow for more space to expand.

» Remove existing sink and cap water line into the room.



Existing Sink



TELECOM ROOM 3A/A312 - TR-3A/A312

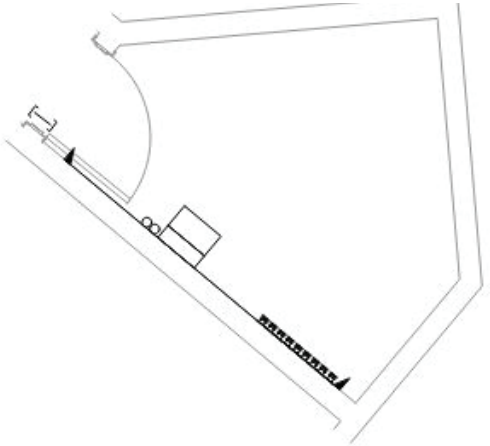
Telecom Room 3A/A312 is located in the south side of the third floor. The room contains no telecom rack or enclosure. All horizontal cabling terminations and patching equipment are mounted on the wall. There are multiple 66-blocks for voice cross-connects and multiple 24-port Category 5e and Category 6 patch panels mounted on wall-mount brackets.

The room is served by Category 5e cabling to TR-270/S206, as well as a 400-pair Category 3 backbone cable for voice to TR-WB04. The 400-pair Category 3 cable terminate on the 66-blocks.

There is limited wall-space for expansion due to all the equipment being mounted on the wall. However, there is space to provide floor-standing equipment racks. There is no grounding bus bar in the room. The room does not contain cooling or humidity control. There are a few convenience receptacles, but no dedicated equipment receptacles. UPS backed power is not available. The room can be locked but there is no other access control on the room.

To meet industry standards, it is recommended to provide ladder racks for cable support. A new floor-standing rack should be installed to provide better organization and space for future growth. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. New standards compliant backbone and horizontal cabling are recommended. The addition of card-based access control is recommended to control access and track access to the space. Ductless split-system cooling unit is also recommended to be installed to provide adequate cooling in the room.

Existing Voice Patching



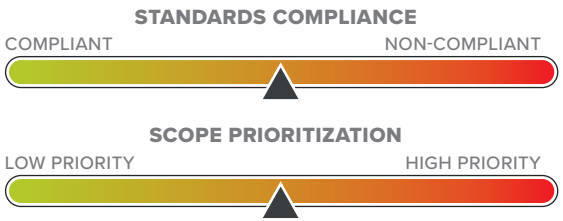
TR-3A Floor Plan

Deficiencies:

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

Recommendations:

- Upgrade existing port locations to Category 6A.
- 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 TR-2W/W202 and TR-3A/A312.
- Add ladder tray and cable management as needed.
- Add Telecommunications Grounding Busbar.
- Add power circuits and receptacles as needed.
- Add ductless split-system cooling unit.
- Control access to authorized individuals.
- Provide new two-post equipment rack to house telecom equipment.



Existing cabling

Existing Data Patching

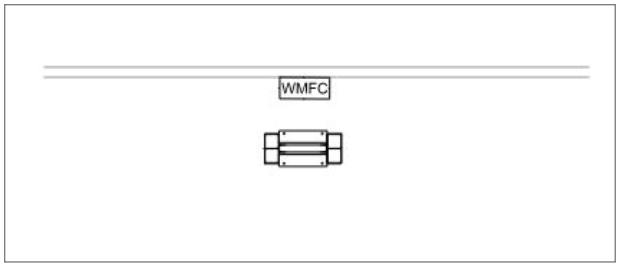
TELECOM ROOM PENTHOUSE - TR-PENTHOUSE

Telecom Room Penthouse is located on the Penthouse level. The wall contains a wall-mounted fiber cabinet and phone provider equipment. There is also a single rack for horizontal cabling terminations and patching. The equipment rack houses a 48-port Category 5e patch panel.

The room is served by a 6-strand OM1 multi-mode OFC to TR-158/S147. All OFC to this room terminates in the wall-mounted fiber cabinets.

Room for expansion is available in the same rack space. There is no grounding bus bar in the room. The room does not contain cooling or humidity control. There are a few convenience receptacles, but no dedicated equipment receptacles. UPS backed power is not available. The room can be locked but there is no other access control on the room.

To meet industry standards, it is recommended to provide ladder racks for cable support. It is also recommended to provide a telecommunications grounding busbar to create a consistent potential across all components. New standards compliant backbone and horizontal cabling are recommended. The addition of card-based access control is recommended to control access and track access to the space. Ductless split-system cooling unit is also recommended to be installed to provide adequate cooling in the room.



TR-WB04 Floor Plan

Existing Phone Provider Equipment

Existing Telecom Rack

Deficiencies:

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

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

» No overhead ladder tray for cable support, leading to cables being draped or placed directly on equipment.

» No grounding busbar for the telecommunications equipment.

» Electrical infrastructure does not meet minimum requirements per standards.

» Uncontrolled access to space with no identity verification.

» No dedicated cooling equipment.

Recommendations:

» Upgrade existing port locations to Category 6A.

» 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 TR-158/S147.

» Add ladder tray and cable management as needed.

» Add Telecommunications Grounding Busbar.

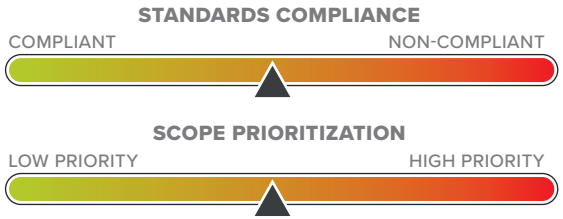
» Add power circuits and receptacles as needed.

» Add ductless split-system cooling unit.

» Control access to authorized individuals..

Existing Fiber Cabinet

Existing Data Patching



TELECOM ROOM WB04 - TR-WB04

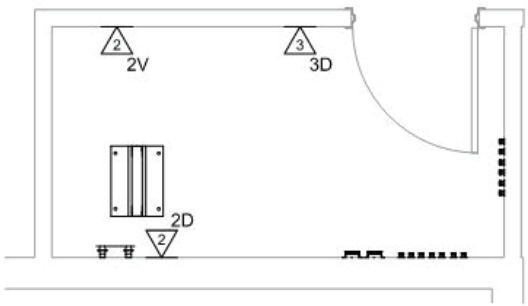
Telecom Room WB04 is located in the basement. One wall contains multiple 66 and 110-blocks for voice cross connection. Another wall contains 66-block with abandoned Category 3 cabling for phone. The telecom room contains only phone cabling.

The room is served by a 100-pair Category 3 cable to TR-2W/W202, 400-pair Category 3 cable to TR-3A/A312, 100-pair to room W114 for cross-connect, and 50-pair to the attic for cross-connect.

There is a single rack in the room that houses an Avaya G450 media gateway. All patching is through 66 and 110-blocks mounted on the wall.

There is currently space for expansion on the rack. A grounding bus bar has been installed in the room, but there is no proper bonding to the telecom equipment. A portable AC unit is being used to provide cooling and humidity control. There are a few convenience receptacles, but no dedicated equipment receptacles. UPS power is available to provide clean, uninterrupted power for the equipment. The room can be locked but there is no other access control on the room.

To meet industry standards, it is recommended to provide a ladder rack for cable support. It is also recommended to provide proper bonding of the telecom equipment to create a consistent potential across all components. New standards compliant backbone and horizontal cabling are recommended. The addition of card-based access control is recommended to control access and track access to the space. A ductless split-system cooling unit is also recommended to be installed in place of the portable AC to provide adequate cooling in the room.



TR-WB04 Floor Plan

Abandoned Phone Patching

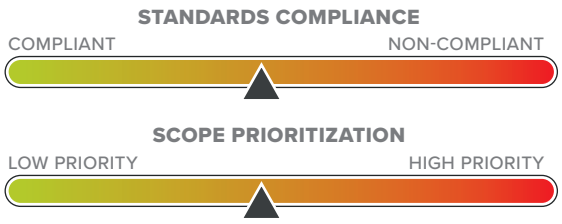
Existing Category 3 Cabling

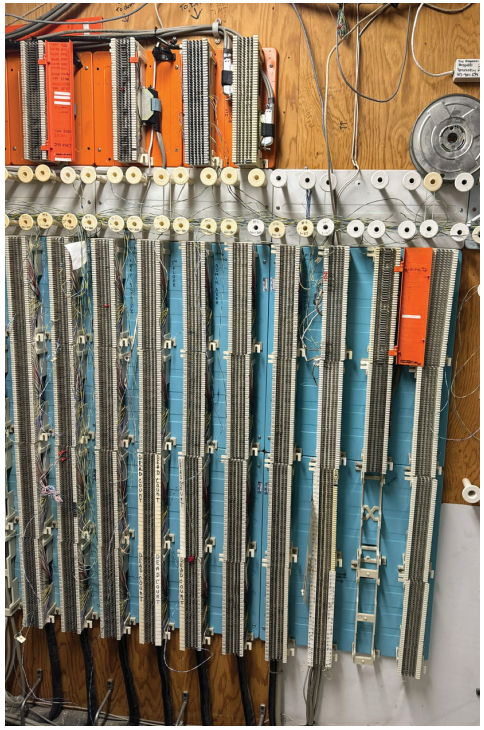
Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- No overhead ladder tray for cable support, leading to cables being draped or placed directly on equipment.
- Equipment is not bonded to the Telecommunications Grounding Busbar.
- Electrical infrastructure does not meet minimum requirements per standards.
- Uncontrolled access to space with no identity verification.
- Portable AC unit is being used to provide cooling.

Recommendations:

- Upgrade existing port locations to Category 6A.
- 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 TR-2W/W202 and TR-3A/A312.
- Add ladder tray and cable management as needed.
- Bond equipment to the Telecommunications Grounding Busbar.
- Add power circuits and receptacles as needed.
- Replace portable AC with ductless split-system cooling unit.
- Control access to authorized individuals.





Existing Phone Cross-Connects

Existing Telecom Rack

Existing Portable AC Unit

CROSS-CONNECT ROOM - W114

Cross-connect room W114 is located on the west side of the first floor. The room is roughly 16 sq-ft and was formerly a janitor's closet. The room is currently used as a cross-connect point for the existing voice Category 3 cabling. One wall contains multiple 66-blocks for voice cross connection.

There is no active equipment in the room and no room for expansion due to the limited space. No grounding bus bar has been installed in the room, and there is no dedicated cooling equipment. The room can be locked but there is no other access control on the room.

> ***Due to the small size, it is recommended that the room be abandoned with all new cabling being routed to TR-121 or ER-112/W108 on the same floor.***

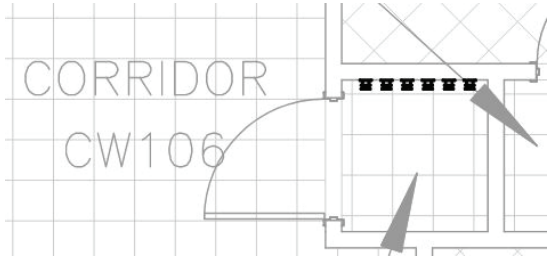
Deficiencies:

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

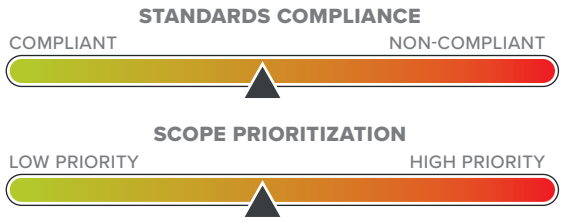
Recommendations:

- Abandon the closet and route all future cabling to TR-121 or ER-112/W108.
- Remove all unused equipment.

Existing Phone Patching



W114 Floor Plan



CROSS-CONNECT ROOM - S137

Cross-connect room WB04 is located on the south side of the first floor. The room is currently used as a storage closet and a cross-connect point for the existing voice Category 3 cabling. One wall contains multiple 66-blocks for voice cross connection.

There is no active equipment in the room and no room for expansion due to the limited space. No grounding bus bar has been installed in the room, and there is no dedicated cooling equipment. The room can be locked but there is no other access control on the room.

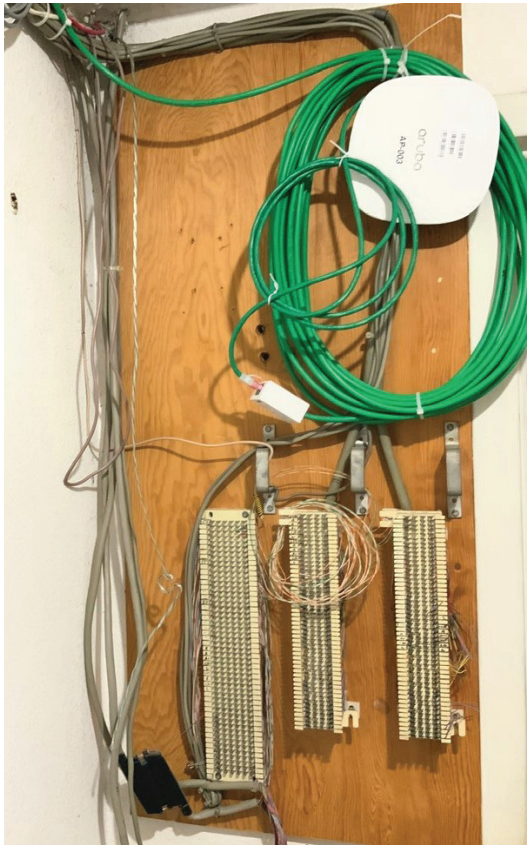
> ***Due to the small size, it is recommended that the room be abandoned with all new cabling being routed to TR-158 on the same floor.***

Deficiencies:

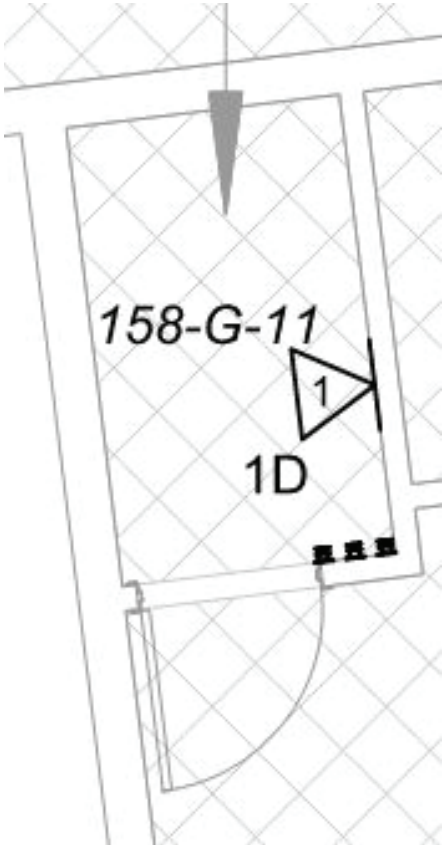
- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- No overhead ladder tray for cable support, leading to cables being draped or placed directly on equipment.
- No Telecommunications Grounding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

Recommendations:

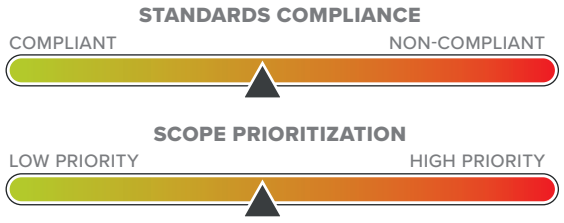
- Abandon the closet and route all future cabling to TR-158.
- Remove all unused equipment.



Existing Phone Patching



Existing Floor Plan



CROSS-CONNECT ROOM - A209A

Cross-connect room A209A is located on the second floor. The room is currently used as a lounge and has a cross-connect point for the existing voice Category 3 cabling. One wall contains a panel with multiple 66-blocks for voice cross connection.

There is no active equipment in the panel. No grounding bus bar has been installed in the area, and there is no dedicated cooling equipment. The room can be locked but there is no other access control on the room.

> ***Due to the small size, it is recommended that the room be abandoned with all new cabling being routed to TR-3A on the third floor.***

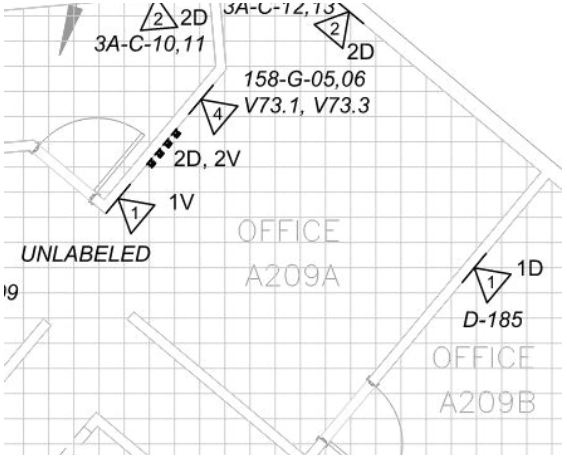
Deficiencies:

- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- No overhead ladder tray for cable support.
- No Telecommunications Grounding Busbar.
- Electrical infrastructure does not meet minimum requirements per standards.
- Uncontrolled access to space with no identity verification.
- No dedicated cooling equipment.

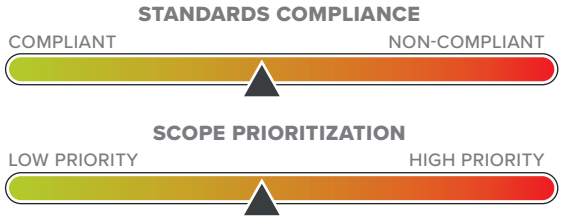
Recommendations:

- Abandon the closet and route all future cabling to TR-3A.
- Remove all unused equipment.

Existing Phone Patching



A209 Floor Plan



CROSS-CONNECT - ATTIC

The attic space is currently used as a large cross-connect point for the existing voice Category 3 cabling. Multiple walls contain service entrance protections, splice boxes, and 66 and 110-blocks for voice cross connection. Half of the cross-connects were not in use and left abandoned.

There is an overhead ladder rack for cable routing. No grounding bus bar has been installed in the area, and there is no dedicated cooling equipment. The room can be locked but there is no other access control on the room.

> ***Due to its location, it is recommended that the room be abandoned with all new cabling being routed to TR-Penthouse on the penthouse level.***

Deficiencies:

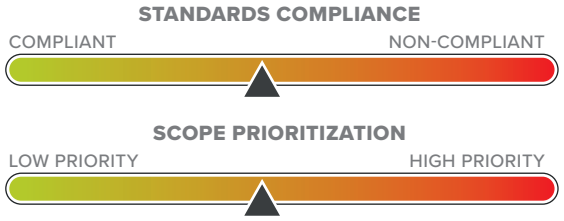
- Horizontal Cabling infrastructure does not meet minimum standards per TIA-1179.
- Backbone Cabling Infrastructure does not meet minimum standards per TIA-1179.
- No Telecommunications Grounding Busbar.
- Electrical infrastructure does not meet minimum requirements per standards.
- Uncontrolled access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

Recommendations:

- Abandon the attic and route all future cabling to TR-Penthouse.
- Remove all unused equipment

Existing Phone Cross-Connect

Abandoned Phone Cross-Connects



APPENDIX A: FULL COST OPINIONS

telecommunications **cost opinion**

Main Building

Telecommunications Infrastructure Assessment Recommendations

Olympic Heritage Behavioral Health Hospital

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

www.hargis.biz

BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** June 27, 2024

JOB NUMBER 24076 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 20%

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	30,341.20	30,341	60,682	60,682	91,024	18,205	109,228
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	59,099.29	59,099			59,099	11,820	70,919
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
New Telecommunications Rooms - HC	3	EA	12,000.00	36,000	2,500.00	7,500	43,500	8,700	52,200
Adaptor Plates - LC	36	EA	150.00	5,400	50.00	1,800	7,200	1,440	8,640
Rack Mount Fiber Cabinet - 4RU	2	EA	390.00	780	110.00	220	1,000	200	1,200
Rack Mount Fiber Cabinet - 2RU	7	EA	300.00	2,100	110.00	770	2,870	574	3,444
Ladder Rack	160	LF	7.50	1,200	20.00	3,200	4,400	880	5,280
20KVA UPS	1	EA	12,600.00	12,600	110.00	110	12,710	2,542	15,252
2000VA UPS	3	EA	3,000.00	9,000	110.00	330	9,330	1,866	11,196
Telecommunication Room Demolition	5	EA			2,000.00	10,000	10,000	2,000	12,000
Demolish Defunct Infrastructure After System Cutover	1	LS			24,000.00	24,000	24,000	4,800	28,800
12 Strand Singlemode Plenum Rated OFC	2,050	LF	.94	1,919	.05	103	2,021	404	2,426
12 Strand Multimode Plenum Rated OFC	2,050	LF	1.25	2,563	.05	103	2,665	533	3,198
Telecommunications Device - 4-Port	515	EA	1,100.00	566,500	473.67	243,942	810,442	162,088	972,530
Telecommunications Device - 4-Port - Existing	112	EA	1,100.00	123,200	473.67	53,051	176,251	35,250	211,502
CAT 6A Quickport Connector	4,120	EA	36.16	148,963	25.00	103,000	251,963	50,393	302,355
CAT 6A Quickport Connector - Existing	896	EA	36.16	32,396	26.00	23,296	55,692	11,138	66,830
CAT 6A Patch Panel	53	EA	320.11	16,966	150.00	7,950	24,916	4,983	29,899
Copper 6-port Empty Cassette	424	EA	100.00	42,400	50.00	21,200	63,600	12,720	76,320
Telecom Room - Electrical Improvements	8	EA	4,000.00	32,000	2,500.00	20,000	52,000	10,400	62,400

telecommunications **cost opinion**

Main Building

Telecommunications Infrastructure Assessment Recommendations

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BASIS OF OPINION Pre-Design **PREPARED BY** Tin Vo **DATE** June 27, 2024

JOB NUMBER 24076 **CHECKED BY** Ben Helms **OVERHEAD & PROFIT** 20%

description	quantity		material cost		labor cost		engineering opinion		
	number	unit	unit cost	total	unit cost	total	subtotal	OH&P	total
Telecom Room - HVAC - Ductless Split System	6	EA	7,500.00	45,000	1,500.00	9,000	54,000	10,800	64,800
Pathway per Drop	515	EA	200.00	103,000	150.00	77,250	180,250	36,050	216,300
Subtotal Low-Voltage Systems (Divisions 27)							**1,938,933**	**387,787**	**2,326,719**
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	661.49	661	1,322.97	1,323	1,984	396.89	2,381
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	1,114.60	1,115			1,115	222.92	1,338
Raceway, Cabling Supports and Outlet Boxes	8	EA	200.00	1,600	200.00	1,600	3,200	640	3,840
SECTION 281300 ACCESS CONTROL SYSTEM									
Access Control Panel w/ Controller	1	EA	2,800.00	2,800	680.00	680	3,480	696	4,176
Door Controller - 2-Door	4	EA	535.00	2,140	85.00	340	2,480	496	2,976
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170.00	170	1,095	219	1,314
Portal Licenses	8	EA	100.00	800	50.00	400	1,200	240	1,440
Card Reader	8	EA	325.00	2,600	127.50	1,020	3,620	724	4,344
Electrified Hardware (Electrified Lock and Power Transfer)	8	EA	1,800.00	14,400	600.00	4,800	19,200	3,840	23,040
Request To Exit (REX)	8	EA	125.00	1,000	85.00	680	1,680	336	2,016
Wiring - Per Access Control Door	8	EA	400.00	3,200	700.00	5,600	8,800	1,760	10,560
Programming	1	LS			5,573.00	5,573	5,573	1,115	6,688
Engineering	1	LS			2,786.50	2,787	2,787	557	3,344
Subtotal Life Safety and Security Systems (Divisions 28)							**56,214**	**11,243**	**67,456**