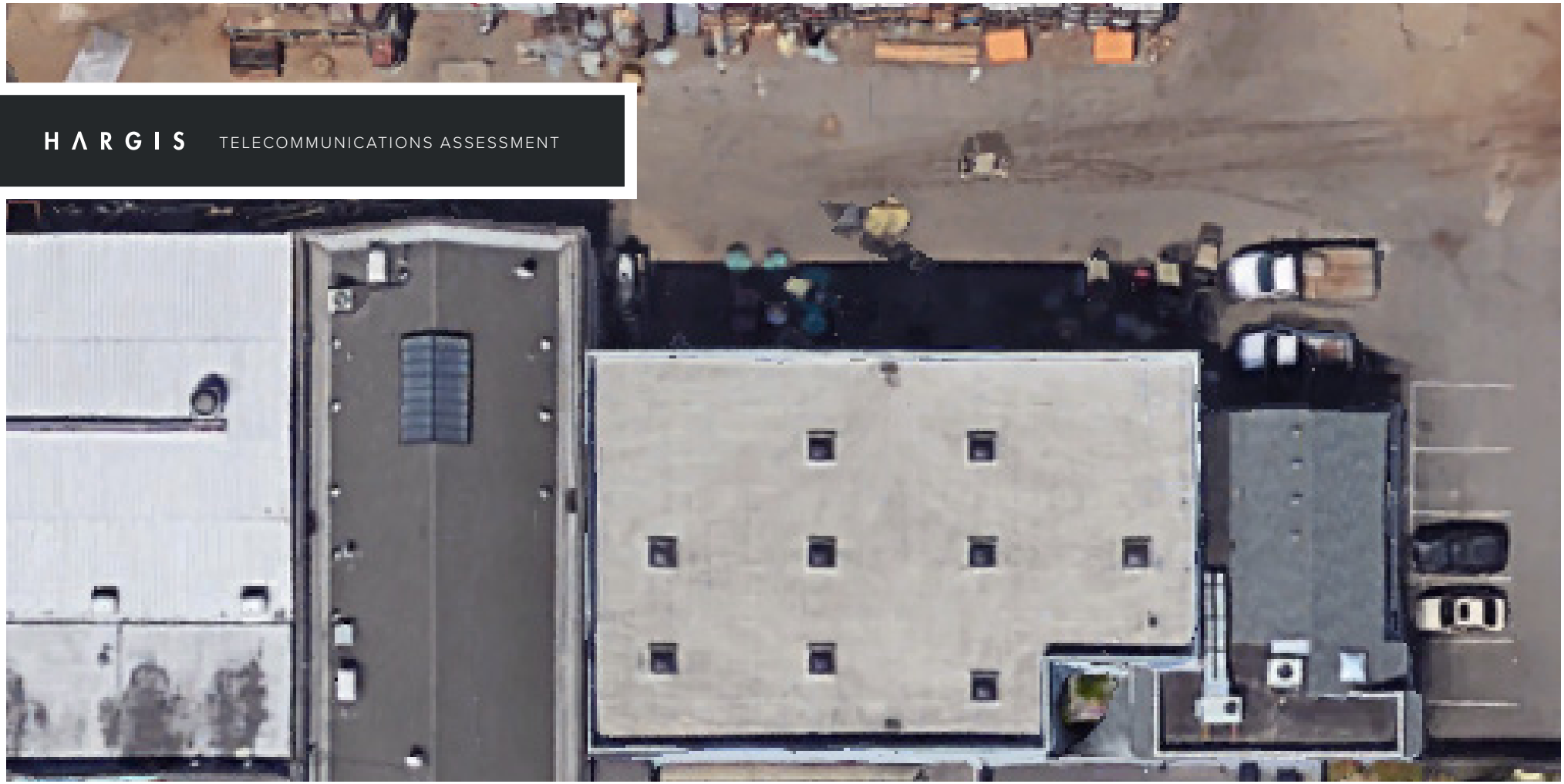


HARGIS TELECOMMUNICATIONS ASSESSMENT

DSHS

KING COUNTY SECURE COMMUNITY TRANSITION FACILITY

WA STATE PROJECT NUMBER: 2024-429 M (10)

EXECUTIVE SUMMARY

OVERVIEW

The King County Secure Community Transition Facility (SCTF), established in 2006, is a state-operated facility under the administration of the Special Commitment Center (SCC) within the Behavioral Health Administration (BHA) of the Department of Social and Health Services (DSHS). The SCTF is designed to provide a secure environment with strictly controlled access and monitored movement, ensuring safety and security while offering treatment programs.

Hargis Engineers was retained to provide an assessment of the current Information Technology Network Infrastructure and develop recommendations for network improvements. The objective of the assessment was to review and evaluate the current campus backbone distribution system, the condition of horizontal cabling, telecommunications grounding, existing physical media types, physical pathways, physical spaces, and supporting electrical and mechanical systems and compare the existing conditions to current industry standards specific to this

CONSULTING TEAM

Hargis Engineers, Inc.
Seattle, WA 98101

Patrick Shannon, RCDD, PMP
Principal

Ben Helms, PE, RCDD
Associate

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. The existing backbone cabling was installed in 2019 as part of the facility's expansion. While the backbone fiber cabling is still in good physical condition, it does not conform with current TIA industry standards for healthcare facilities.

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 condition of the cabling varies, with roughly half being Category 5e and half consisting of Category 6, which does not meet current industry infrastructure standards. Based on physical inspection and review of existing documentation, it is determined that the existing IT infrastructure does not comply with most of the current industry standards and will not support evolutions to modern and/or future technologies.

The existing optical fiber infrastructure, consisting of OM3 50-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 King County SCTF 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 CODE COMPLIANCE

INTRA-BUILDING BACKBONE

HORIZONTAL CABLING

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, 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 King County SCTF 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

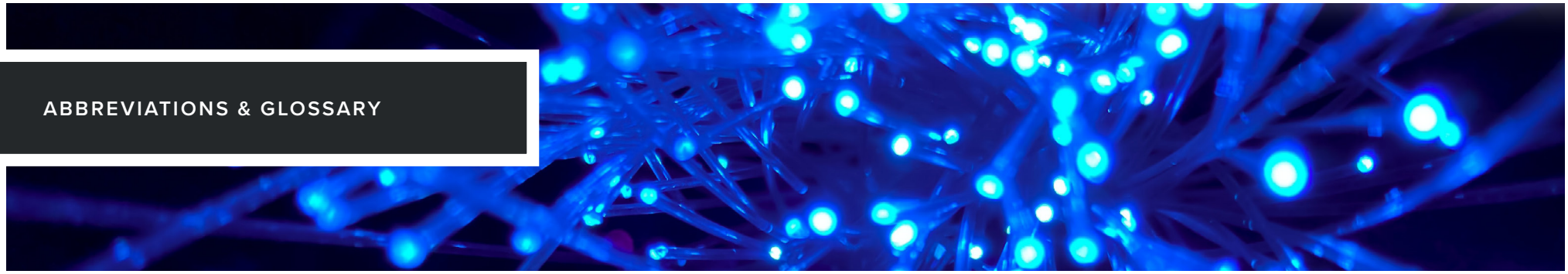
Review, assess and evaluate systems in each building

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.

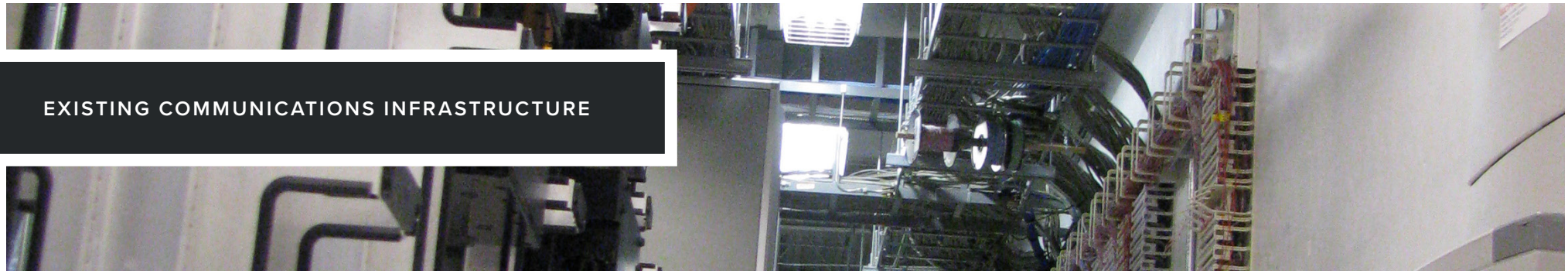
TR **Telecommunications Room (previously known as IDF)**
An enclosed architectural space designed to contain telecommunications equipment, cable terminations, or cross-connect cabling.

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*
PHYSICAL CONSTRUCTION OF NEW TELECOMMUNICATIONS			
1	N/A	» Retrofit Telecommunications Rooms 145 & 206 - 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 MDF 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.)	$74,860
INSTALL BACKBONE OFC TO NEW TELECOM SPACES			
2	N/A	» Pull 12 strand OS2 and 12 st OM4 OFC from first floor Main Equipment Room 145 to Telecommunications Room 206. - Terminate OFC Cabling if RMFC is installed.	$1,850
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.	$21,740
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.	$77,300
DEMOLISH DEFUNCT INFRASTRUCTURE			
6	1-5	» Demolish Existing backbone cabling - Demolish OM3 Multi-mode OFC between MER and defunct TRs.	$7,720



BACKBONE CABLING

Service Provider Connections

King County SCTF receives internet service through a point-to-point (P2P) wireless microwave connection from an internet service provider called StarTouch Inc. The microwave connection is a wireless connection between two transceivers that creates a direct dedicated link for data transmission. Phone service provider connection is provided with a 100-pair twisted-pair copper backbone cable from the utility to the demarcation point in the first floor Equipment Room.

INTRA-BUILDING BACKBONE CABLING

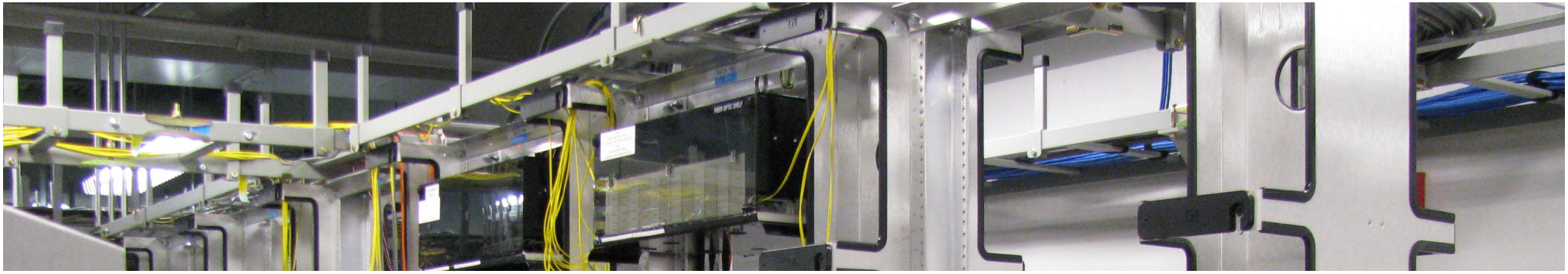
12-strand OM3 50-micron multi-mode optical fiber cable is utilized between the first floor Equipment Room and second floor telecom room. To meet TIA standards, the backbone fiber cabling should be upgraded to a minimum of OM4 multi-mode and augmented with the addition of single-mode optical fiber cable. 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.

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



VOICE HORIZONTAL CABLING

Upon review of the voice infrastructure at King County SCTF, it has been identified as insufficient to meet the current and future communication needs. The existing phone system uses a VOIP system based on Category 5e and 6 cabling, which is patched to a VOIP switch.

The existing Category 5e and 6 infrastructure is not adequate to meet the current and future needs of King County SCTF. The Category 5e and 6 cabling are not in compliance with TIA standards for infrastructure. It is recommended that the existing cabling infrastructure be replaced with new cabling infrastructure, 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

ETHERNET HORIZONTAL CABLING

The existing ethernet network is comprised of a mix of Category 5e and 6 cabling. The existing patch panels, connectors, and patch panels meet Category 5e and 6 standards. King County SCTF underwent a project to install wireless access point cabling in the second-floor office space, but the wireless access point devices were never installed. Category 6 cabling was installed to support the wireless infrastructure.

The existing Category 5e and 6 infrastructure is not adequate to meet the current and future needs of King County SCTF. The Category 5e and 6 cabling are not in compliance with TIA standards for infrastructure. It is recommended that the existing cabling infrastructure be replaced with a new Category 6A cabling infrastructure.

Meeting TIA-1179-A 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 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.

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. Category 6A patch panels will have to be provided and network support equipment will have to be grounded to their bonding busbar. 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 through the use of 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.

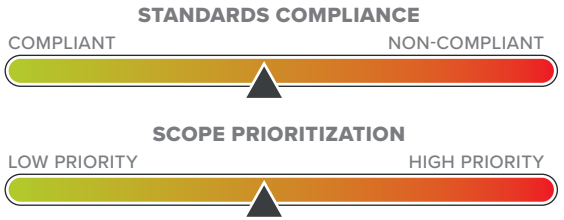
EVALUATION CRITERIA FOR TELECOMMUNICATIONS ROOMS	
Room/Space	» Quantity, Location, and Size of Telecommunications Room. » Available space to install and terminate new cabling and rack space to mount new equipment » Adequate working clearances to access and maintain additional equipment and cabling »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

MAIN EQUIPMENT ROOM

EQUIPMENT ROOM 145

The Main Equipment Room is on the first floor. One wall of the room supports the voice horizontal cabling terminations and patching. There is a mix of current and abandoned cabling, building entrance protection, and termination blocks. There is a wall-mounted rack housing fiber patch panels for a 12-strand OM3 multi-mode OFC. It also houses a 24-port and a 48-port Category 5e patch panel. The room is served by a 12-strand OM3 multi-mode OFC to the upper telecom room and a 100-pair Category 3 twisted-pair copper cable from the Service Provider. There is currently no room for expansion due to the limited sizing of the space. A grounding bus bar has been installed in the room, but there is no proper bonding 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.

It is recommended to bond telecom equipment to the grounding bus bar to create a consistent potential across all components. A new standards-compliant backbone and horizontal cabling are recommended. The addition of card-based access control or other measures is recommended to control and track access to the space.

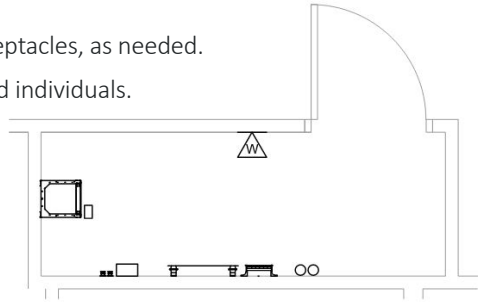


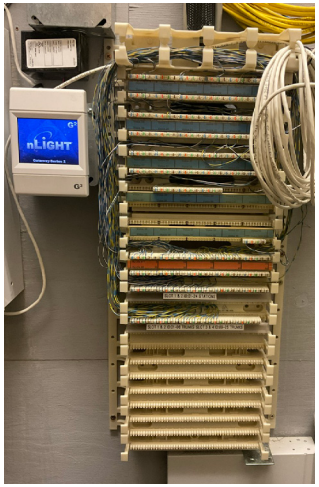
Deficiencies:

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

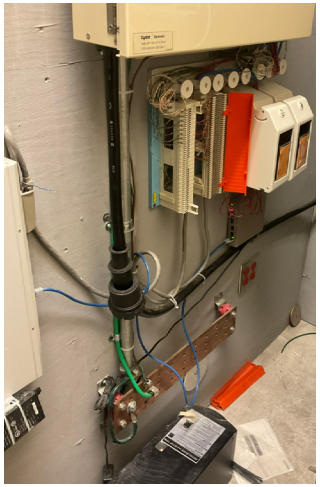
Recommendations:

- 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 second floor telecom room.
- Add ladder tray and cable management, as needed.
- Bond equipment to the Telecommunications Grounding Busbar.
- Add power circuits and receptacles, as needed.
- Control access to authorized individuals.



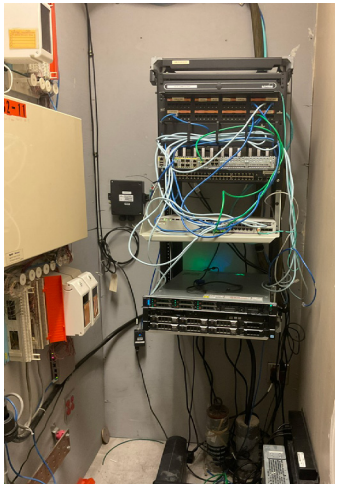


Abandoned 110-block



TGB & Service Entrance Copper

Wall-mounted Equipment

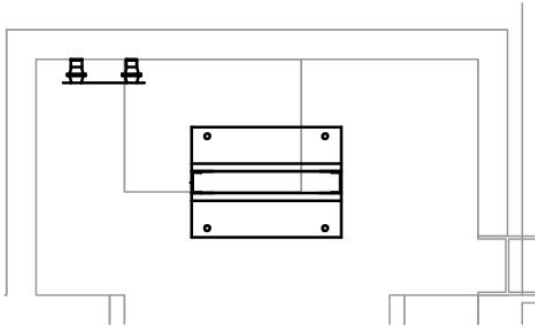


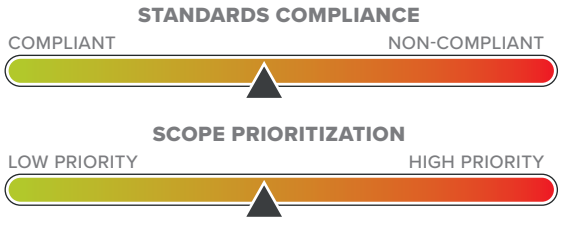
Wall-mounted Rack

TELECOM ROOM 206 – TR-206

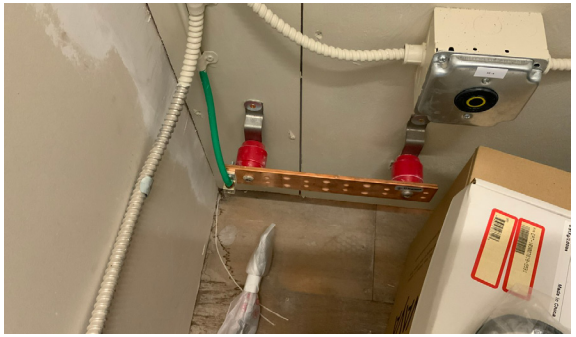
The Telecom Room 206 for King County SCTF is on the second floor. This telecom room was added in 2019 as part of the facility expansion. There is a two-post equipment rack housing fiber patch panels for a 12 strand OM3 multi-mode OFC. It also houses a 48-port Category 6 patch panel. The room is served by a 12-strand OM3 multi-mode OFC to the Main Equipment Room. Room for expansion is available in the same rack space. A grounding bus bar has been installed in the room, but there is no proper bonding to the telecom equipment. There is cooling and humidity control present in the room. 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.

New standards compliant backbone and horizontal cabling are recommended. The addition of card-based access control or other measure is recommended to control and track access to the space.





50MM OM3 Fiber



Grounding Busbar Not Connected to Rack

Telecommunications Rack

Deficiencies:

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

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 second floor telecom room.
- Add ladder tray and cable management as needed.
- Bond equipment to the Telecommunications Grounding Busbar.
- Add power circuits and receptacles as needed.
- Control access to authorized individuals.

APPENDIX A: FULL COST OPINIONS

telecommunications **cost opinion**

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Telecommunications Infrastructure Assessment Recommendations
King County Secure Community Transition Facility

BASIS OF OPINION	Pre-Design	**PREPARED BY**	Tin Vo	**DATE**	June 11, 2024
JOB NUMBER	24077	**CHECKED BY**	Ben Helms	**OVERHEAD & PROFIT**	20%

telecommunications summary		subtotal	OH&P	total
Main Building		$ 152,890	$ 30,578	$ 183,468
Sub-Total		$ 152,890	$ 30,578	$ 183,468
General Contractor OH&P	**15%**			$ 27,520
Escalation	**7%**			$ 1,926
Total				**$ 212,915**

EXCLUSIONS

1 - Design contingency

2 - Sales Tax

telecommunications **cost opinion**

Main Building

Telecommunications Infrastructure Assessment Recommendations

King County Secure Community Transition Facility

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 11, 2024

JOB NUMBER 24077 **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	2,005.71	2,006	4,011	4,011	6,017	1,203	7,221
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	4,199.59	4,200			4,200	840	5,040
SECTION 271100 TELECOMMUNICATION DISTRIBUTION SYSTEM									
New Telecommunications Rooms - MC		EA	18,000.00		5,000.00				
New Telecommunications Rooms - HC		EA	12,000.00		2,500.00				
New Telecommunications Rooms - HC		EA	4,500.00		1,200.00				
Backbone Cabling - Copper & Optical Fiber		LF	3.00		2.75				
Adaptor Plates - LC	4	EA	150.00	600	50.00	200	800	160	960
Rack Mount Fiber Cabinet - 4RU		EA	390.00		110.00				
Rack Mount Fiber Cabinet - 2RU	1	EA	300.00	300	110.00	110	410	82	492
Ladder Rack		LF	7.50		20.00				
Ventilated Rack		EA	7,500.00		800.00				
20KVA UPS	1	EA	12,600.00	12,600	110.00	110	12,710	2,542	15,252
2000VA UPS		EA	3,000.00		110.00				
Telecommunication Room Demolition		EA			2,000.00				
Demolish Defunct Infrastructure After System Cutover	1	LS			6,000.00	6,000	6,000	1,200	7,200

telecommunications **cost opinion**

Main Building

Telecommunications Infrastructure Assessment Recommendations

King County Secure Community Transition Facility

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 11, 2024

JOB NUMBER 24077 **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
12 Strand Singlemode Outside Plant (OSP) OFC		LF	2.50		.05				
12 Strand Multimode Outside Plant (OSP) OFC		LF	1.19		.05				
12 Strand Singlemode Plenum Rated OFC	100	LF	.94	94	.05	5	99	20	118
12 Strand Multimode Plenum Rated OFC	100	LF	1.25	125	.05	5	130	26	156
Telecommunications Device - 4-Port	7	EA	1,100.00	7,700	473.67	3,316	11,016	2,203	13,219
Telecommunications Device - 4-Port - Existing	29	EA	1,100.00	31,900	473.67	13,737	45,637	9,127	54,764
CAT 6A Quickport Connector	56	EA	36.16	2,025	25.00	1,400	3,425	685	4,110
CAT 6A Quickport Connector - Existing	232	EA	36.16	8,388	26.00	6,032	14,420	2,884	17,304
CAT 6A Patch Panel	3	EA	320.11	960	150.00	450	1,410	282	1,692
Copper 6-port Empty Cassette	24	EA	100.00	2,400	50.00	1,200	3,600	720	4,320
Telecom Room - Electrical Improvements	2	EA	4,000.00	8,000	2,500.00	5,000	13,000	2,600	15,600
Telecom Room - HVAC - Ductless Split System	1	EA	7,500.00	7,500	1,500.00	1,500	9,000	1,800	10,800
Pathway per Drop	7	EA	200.00	1,400	150.00	1,050	2,450	490	2,940
Subtotal Low-Voltage Systems (Divisions 27)							**134,323**	**26,865**	**161,187**
DIVISION 28									
LIFE SAFETY & SECURITY SYSTEMS - DIVISIONS 28									
General Provisions (Submittals, Mobilization, Permits)	1	LS	209.64	210	419.28	419	629	125.78	755
Basic Materials and Methods (Consumables, Small Tools, Equip Rental, Grounding, Identification, etc.)	1	LS	390.40	390			390	78.08	468
Raceway, Cabling Supports and Outlet Boxes	2	EA	200.00	400	200.00	400	800	160	960

telecommunications **cost opinion**

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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	680.00	680	3,480	696	4,176
Door Controller - 2-Door	1	EA	535.00	535	85.00	85	620	124	744
Power Supply 10A/24V - 8-Door	1	EA	925.00	925	170.00	170	1,095	219	1,314
Power Supply 10A/24V - 16-Door		EA	1,950.00		255.00				
Portal Licenses	2	EA	100.00	200	50.00	100	300	60	360
Card Reader	2	EA	325.00	650	127.50	255	905	181	1,086
Electrified Hardware (Electrified Lock and Power Transfer)	2	EA	1,800.00	3,600	600.00	1,200	4,800	960	5,760
Request To Exit (REX)	2	EA	125.00	250	85.00	170	420	84	504
Wiring - Per Access Control Door	2	EA	400.00	800	700.00	1,400	2,200	440	2,640
Programming	1	LS			1,952.00	1,952	1,952	390	2,342
Engineering	1	LS			976.00	976	976	195	1,171
Subtotal Life Safety and Security Systems (Divisions 28)							**18,567**	**3,713**	**22,281**