

PART 1 GENERAL

1.01 SUMMARY OF WORK AND NOTES TO DESIGNER

- A. Section includes, but is not limited to, general requirements for communications and electronic installations for the Port of Seattle facilities. The Work includes:
1. Coordination of all communication design, terminations and labels with Port of Seattle Sea-Tac/Seaport Telecommunications Architectural Review Team (START) and submit a START application.
 2. Contacting the Port of Seattle ICT Service Desk at 206-787-3333 to assist with new and existing communication connectivity throughout the Port of Seattle infrastructure plant.
 3. Provide and install pathways for Backbone fiber optic and copper cabling.
 4. Provide and install pathways for Horizontal fiber optic and copper cabling.
 5. Color code pathway; refer to Section 27 05 53.23 – Port of Seattle Color code requirement.
 6. Provide and install fiber optic and copper cabling through pathways.
 7. Fusion splice (CIBS) Communications Infrastructure Backbone System fiber optic and terminate CIBS copper cable in communications rooms and connect to end devices.
 8. Provide testing of communication components and systems to meet Systimax Solutions warranty requirements and/or Port specifications. Coordinate with the Construction Manager for UTP and fiber optic cable testing.
 9. Provide and install labels; refer to Section 27 05 53.13 – Communications Standard for Labeling and Nomenclature.
 10. Contractor to provide as-built labeling, drawing information and warranty certificates to Port of Seattle within three (2) weeks of project completion.
 11. Coordinate with Port of Seattle, Construction Manager and other contractors for use of existing cable pathways (cable trays and conduits) to install portions of the cabling.
 12. Comply with low-voltage grounding specifications in Section 26 05 26 – Grounding and Section 27 05 26, Grounding and bonding for Communications.
 13. Communication Room Requirements
 1. Airline tenants and vendors shall not install equipment in Port telecomm equipment rooms in order to maintain PCI compliance.
 1. Port of Seattle does not allow shared comm rooms with tenants and vendors.
 - a. In limited circumstances, a variance may be granted by F&I and ICT.
 2. Service provider equipment may be allowed in Port telecomm rooms with F&I and ICT approval.

14. Tenant Demarcation Package
 1. A tenant demarcation package (tenant demarc) is required for all spaces leased by tenants. This includes Airport Dining and Retail tenants and Airline tenants.
 2. A separate tenant demarc is required for each leased space that is non-contiguous with another space leased by the same tenant.
 3. It is not acceptable to run horizontal cabling to a tenant leased space through a space that is not leased by the same tenant.
 4. Material requirements for the tenant demarc package are found in 1.05.C(4) below.
15. Recertification requirements for existing backbone infrastructure
 1. Backbone cabling infrastructure shall be manufactured by Commscope/Systimax, no equal, any substitutions or variances must be approved by START committee.
 2. Products and materials shall be new and fit the intended purpose
 3. Damaged or defective products and components shall be replaced by Contractor at no additional cost to the Port.
 4. Cabling and termination hardware damaged prior to system acceptance shall be replaced by Contractor at no additional cost to the Port.
 5. Miscellaneous materials required for a complete and operational cabling system shall be provided by the Contractor.
 6. All communication materials shall be subjected to final approval by the Port of Seattle START committee.
 7. Contractor is responsible to re-certify existing infrastructure when re-installed, relocated, and ALL existing infrastructure in immediate location to be operational prior to system acceptance, and at no additional cost to the Port.
16. Re-certification requirements for existing horizontal infrastructure:
 1. Horizontal cabling infrastructure shall be manufactured by Commscope/Systimax, no equal. Any substitutions or variances must be approved by START committee
 2. Products and materials shall be new and fit the intended purpose
 3. Damaged or defective products and components shall be replaced by Contractor at no additional cost to the Port.
 4. Cabling and termination hardware damaged prior to system acceptance shall be replaced by Contractor at no additional cost to the Port.
 5. Miscellaneous materials required for a complete and operational cabling system shall be provided by the Contractor.

6. All communication materials shall be subjected to final approval by the Port of Seattle START committee.
7. Contractor is responsible to re-certify existing infrastructure when re-installed, relocated, and ALL existing infrastructure in immediate location to be operational prior to system acceptance, and at no additional cost to the Port.

1.02 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.
- B. Specifications throughout all Divisions of the Project Manual are directly applicable to this Section, and this Section is directly applicable to them, including but not limited to the following:
 1. Division 07 (07 84 00) - Penetration Fire stopping
 2. Section 27 05 26 - Grounding and Bonding for Communications Systems
 3. Section 27 05 28 - Communications Pathways
 4. Section 27 05 53 - Identification and Labelling
 5. Section 27 11 00 – Communications Systems Equipment Rooms
 6. Section 27 13 00 - Backbone Cabling Requirements
 7. Section 27 15 00 - Horizontal Cabling

1.03 GOVERNING CODES, STANDARDS AND REFERENCES

- A. The latest published edition of a reference shall be applicable to this project unless identified by a specification date.
- B. ANSI/TIA/EIA-568-C, Commercial Building Telecommunications Wiring Standard.
- C. ANSI/TIA-569-B Commercial Building Standard for Telecommunications Pathways and Spaces.

- D. ANSI/TIA-606-A Administration Standard for Commercial Telecommunications Infrastructure
 - E. ANSI-J-STD-607-A Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications.
 - F. ANSI/TIA-758-A, Customer-Owned Outside Plant Telecommunications Infrastructure Standard.
 - G. BICSI (Building Industry Consulting Services International): Comply with the most current editions of the following BICSI manuals:
 - 1. BICSI - Telecommunications Distribution Methods Manual
 - 2. BICSI – Installation Transport Systems Information Manual
 - 3. BICSI – Network Design Reference Design Manual
 - 4. BICSI – Outside Plant Design Reference Manual
 - 5. BICSI – Wireless Design Reference Manual
 - 6. BICSI -Electronic Safety and Security Design Reference Manual
 - 7. Infocomm/BICSI – AV Design Reference Manual
 - H. Underwriters Laboratories (UL) Cable Certification and Follow-Up Program.
 - I. National Electrical Manufacturers Association (NEMA)
 - J. American Society for Testing Materials (ASTM)
 - K. National Electrical Code (NEC) with applicable edition year
 - L. National Electrical Safety Code (NESC) with applicable edition year
 - M. Institute of Electrical and Electronic Engineers (IEEE)
 - N. UL Testing Bulletin
 - O. Building Industry Consulting Services International (BICSI) Information Transport Systems Methods Manual (ITSMM)
 - P. Canadian Standards Association (CSA)
 - Q. ETL Testing Laboratories
 - R. Federal Communications Commission (FCC)
 - S. Labor and Industries (L&I)
 - T. Washington State Department of Labor and Industries
- 1.04 SUBMITTALS
- A. Submit materials data in accordance with of Section 01 33 00 - Submittals. Furnish manufacturers' technical literature, standard details, product specifications, and installation instructions for all products.
 - B. If providing alternatives or substitution requests to Port of Seattle, get approval prior to purchase and installation.
- 1.05 PORT OF SEATTLE INFRASTRUCTURE REQUIREMENTS.
- A. Shielded (F/UTP), Unshielded (U/UTP) twisted pair cable:

1. CAT6/6a cabling used as backbone or horizontal cabling must have a passing test result, as well as be under the 90m/295' maximum permanent link threshold.
2. Installation of Systimax/Commscope CAT5e 25pr cable over 4000', will require a designed consolidation point, approved splice, or wall field termination distribution. Manufacturer does not make this cable over 4000'.
3. Follow TIA/EIA-758-B, regarding outdoor (OSP) cabling grounding requirements.
4. Acceptable Premise 4-pair twisted copper solutions:
 1. Commscope/Systimax GigaSPEED XL 1071E, Cat 6 U/UTP, non-plenum, red jacket.
 2. Commscope/Systimax GigaSPEED XL 2071E, Cat 6 U/UTP, plenum, red jacket.
 3. Commscope/Systimax GigaSPEED XL 1091E, Cat 6a U/UTP, non-plenum, orange jacket.
 4. Commscope/Systimax GigaSPEED XL 2091E, Cat 6a U/UTP, plenum, orange jacket.
 5. Or Approved Equal, approval must come via Sea-Tac Telecommunications Architectural Review Team (START).
5. Acceptable outdoor (OSP) 4-pair twisted copper solutions:
 1. Commscope/Systimax 1572A- Outdoor Cat 6 F/UTP, black jacket.
 2. Commscope/Systimax 1592A- Outdoor Cat 6a F/UTP, black jacket.
 3. Or Approved Equal, approval must come via Sea-Tac Telecommunications Architectural Review Team (START).
6. Acceptable outdoor (OSP) multipair copper solution 25pr+:
 1. Superior Essex MegaPic OSP.
 2. Mohawk LAN-Trak OSP.
 3. Or Approved Equal. Approval must come via Sea-Tac Telecommunications Architectural Review Team (START).
7. The following UTP cables shall be utilized for Port of Seattle HORIZONTAL runs:
 1. Office builds over 100 sq ft require a minimum of (2) CAT6 per work station outlet. Greater quantities will be considered and approved by START.
 1. For standalone equipment locations such as network printers, phones, cameras, access control, or any AV-M/Seaport-M managed device, shall require a minimum of (2) Data to a Duplex outlet, unless previously varied. Termination hardware can vary for these applications, but note that field termination to a male RJ-45 will not be accepted.

2. Note to Communication Engineers: Port of Seattle's move to a Voice over Internet Protocol (VoIP) allows migration off of the need for horizontal voice runs. Any necessary horizontal voice runs can be addressed in the Equipment Room (ER) with addition of a 24 port patch panel in rack to the 110 wall field with 25pr. tie cables. Scale tie cable and panels in ER per Work area estimates for legacy analog voice needs.
8. Common Use work stations requirements:
 1. Ticketing counters, gate counters, and podiums shall receive (4) CAT6 data jacks per agent work station, and sourced back to gate FTBS rack.
 2. Boarding Gate Reader (BGR) scanners shall receive (2) CAT6 data jacks, and sourced back to gate FTBS rack.
 3. BGR scanners shall also receive (2) CAT6 data jacks that are cabled directly to gate podium/gate counter, in support of serial connectivity. Contractor shall coordinate location of supporting CUSE hardware with AV Maintenance.
 1. Serial connection distance requirements shall be followed for RS-232 (50' max) and RS-485 (40' max).
 4. Ticketing kiosks shall receive (2) CAT6 data jacks per kiosk (CUSE or tenant proprietary).
 5. Data circuits: 4-pair Category 6/6a (Cat 6/6a)
 1. Terminate Source (Port Communication Rm.)
 - a. Existing CIBS ERs- conform to existing hardware layout, unless otherwise directed by START. Hardware options are as follows(note-GS3= CAT6 and GS6= CAT6A):
 - (i) Systimax PatchMax patch panel PM-GS3-24.
 - (ii) Systimax 360 PatchMax patch panel 360-PM-GS3-2U.
 - (iii) Systimax 360 Evolve 1100GS3 24-port flat patch panel.
 - (iv) Systimax 360 Evolve 1100GS3 48-port flat patch panel.
 - (v) Systimax 360 Evolve 1100GS3 24-port angled patch panel.
 - (vi) Systimax 360 Evolve 1100GS3 48-port angled patch panel.
 - b. New CIBS ERs and racks- follow START direction and current elevation standards for layout. Hardware options are as follow (note-GS3= CAT6 and GS6= CAT6A):

- (i) Systimax 360 Evolve 1100GS3 24-port angled patch panel.
 - (ii) Systimax 360 Evolve 1100GS3 48-port angled patch panel
 - 2. Terminate Destination end to Systimax GigaSPEED XL; MGS400 (Red) information outlet
 - 3. Cat 6a cable are for the WiFi; MGS600 (Orange) information outlet
 - 6. Wireless Access Points (WAPs)
 - 1. Infrastructure requirements:
 - a. Requires (2) Systimax 1091B, 2091B, or 1592A cables, depending on environment.
 - (i) Indoor: Orange cable
 - (ii) Outdoor: Black cable
 - b. Requires (2) Systimax MGS600, CAT6a, orange, information outlets (RG-45 female jack)
 - 2. Mounting and Patching requirements
 - a. Contractor shall patch WAP device ethernet port and console port using Commscope approved CAT6a patch cable.
 - b. Additional mounting options must be submitted on and approved by START and/or design review.
 - c. NEMA rated enclosures must maintain NEMA rating. Include cabling terminations and patch cables as a part of the NEMA rating.
9. The following UTP cables shall be utilized for Port of Seattle BACKBONE cable infrastructure
 - 1. Voice circuits (Inside plant only): 25-pair Category 5e (Cat 5e) use one to four cables to cover 25pr up to 100pr. counts or:
 - 2. Voice circuits (Outside Plant [OSP] applications & high pair count): 100-pair and up Category 3 (Cat 3)
 - 3. Terminate Source (Port Communication Rm.) to Systimax 300pr. 110 wiring block; 110AW2-300. Utilize 110C connecting blocks, (5) C5's per row.
 - 4. OSP applications shall follow required protector panel setup at each end of cable
 - 5. Data circuits: 4-pair Category 6/6a (Cat 6/6a) for TENANT Demarcation Backbone Equipment panel; minimum six (6) Cat 6/6a.

6. Consideration shall be given to other copper install applications where projects fit a scalable need over time or technology demands an adaptable install such as ICT Data Centers. Manufacturer shall offer a certified and tested material; Installed Copper shall provide a minimum 20 year warranty.
- B. Fiber Optic Infrastructure (FO cable)
1. The Port recognizes Commscope/Systimax TeraSPEED single mode fiber optic cable (SMF) as its standard for fiber optic HORIZONTAL and BACKBONE installations.
 2. Multimode fiber optic cable (MMF) installations to be approved by START
 3. The following fiber optical cables shall be utilized for Port HORIZONTAL applications.
 1. Fiber Horizontal (FH), 12 strand single mode minimum
 2. Terminate Source (Port Communication Rm.), new and existing environment options are as follows
 1. Existing environments to accept:
 - a. Systimax SC duplex connectors
 - b. OFS 144 port, 5 RU Fiber Optic shelf, w/ (6) 24 strand adapter panels
 2. New environments/installations to accept
 - a. Systimax LC duplex connectors
 - b. Commscope/Systimax SD-4U-FX, w/ (12) 12 strand 1000 style adapter panels, furnishing up to 144 strands per FOPP (or approved Commscope/Systimax equal)
 3. Destination termination equipment varies per application; refer to engineered drawings.
 4. As required, utilize necessary Fiber optic cables, patch panels, splice shelves, adapters, connectors, buffer kits, breakout kits, consumables, and accessories.
 4. The following Fiber Optic (FO) cables shall be utilized for Port of Seattle BACKBONE applications such as Port backbone additions or new construction of MDR to ER, ER to ER, and ER to TE. Also, Tenant Demarcation Work of ER to Equipment panel or cabinet.
 1. Contractor shall fusion splice fiber optical pigtails onto ALL CIBS MDR to ER fiber optical cabling.
 1. Fusion splice loss of single mode fiber shall be no more than 0.3 dB per fusion splice.
 2. Port has the right to change fusion splicing requirements per application.
 2. New construction of a Port ER, requires a minimum of 144 single mode fiber (SMF) each, to a minimum of (2) MDRs, as a part of the

- CIBS. START committee will confirm the MDR assignments during project design review.
3. Minimum Fiber Backbone (FB): (12) strands of single mode fiber is the minimum that can be installed to a tenant DMARC package, or any other tenant or proprietary fiber that terminates in a Port ER or EQ. Unless previously varied by START
 4. Terminate SMF in assigned Fiber Optic Patch Panel (FOPP).
 1. Terminate Source (Port Communication Rm.) , new and existing environment options are as follows
 - a. Existing environments to accept:
 - (i) Systimax SC duplex connectors
 - (ii) OFS 144 port, 5 RU Fiber Optic shelf, w/ (6) 24 strand adapter panels
 - b. New environments to accept
 - (i) Systimax LC duplex connectors
 - (ii) Commscope/Systimax SD-4U-FX, w/ (12) 12 strand 1000 style adapter panels, furnishing up to 144 strands per FOPP (or approved Commscope/Systimax equal)
 2. Destination termination equipment* varies per application; refer to engineered drawings.
 3. As required, utilize necessary Fiber optic cables, patch panels, splice shelves, adapters, connectors, buffer kits, breakout kits, consumables, and accessories.
- C. Port of Seattle Communication Space information
1. Main Distribution Rooms (MDR)
 1. Follow layout notes for ER's below and size of the MDR shall meet or exceed the space of an ER (10 ft x 15 ft)
 2. The MDR will hold all Backbone tie cables (Fiber and Copper) to all the Equipment rooms within building or small campus. A larger campus or build may require multiple MDR's.
 2. Entrance Facility (EF)
 1. Place adjacent to the MDR or within 50 ft connected to MDR with sufficient cable tray and/or four (4) 4" conduits
 2. EF to house the Access Providers (AP) equipment secure and separate from Port communications
 3. Minimum EF size shall be 4 ft x 6ft; coordinate with local AP(s).
 3. Equipment Rooms (ER)
 1. ER may be used as an EF and MDR; room size considerations must be addressed to ensure room for growth.

2. Preferred ER shall be at least 10 ft x 15 ft to allow for growth and equipment changes throughout life of the ER.
3. Refer to DIV 27 Appendix 13 for rack elevation.
4. 12' or 18" wide Ladder rack (cable tray)(START to approve) shall circle the rooms interior walls at 6" from wall and at least 8 ft above finished floor
5. Ladder rack shall cross parallel and centered over each row of racks.
 1. Waterfalls shall be placed above vertical wire management, to allow for cable to sweep into wire management, and to avoid possible cable damage.
6. ER preference is two tiers of 18" wide ladder rack separated by 12" from lower ladder rack and maintaining 12" of clearance from ceiling. Top tier is for Backbone cable (except tenant demarcation package) and lower tier is for horizontal cable and tenant demarcation package(s). Two tier ladder rack system is mandatory in a MDR.
 1. The use of 12" wide ladder rack in the place of 18" wide ladder rack will require a variance, and approval by START.
7. HVAC required to maintain a room temperature of 70°.
8. Equipment Racks: Minimum of three open frame 7', 45 rack unit (RU) equipment racks with a 6" vertical wire manager on ends and between all racks, START to approve rack size variances; typical rack setup:
 1. Rack one: All Fiber Optic terminations/ FOPP's.
 2. Rack two: Active Network Equipment, other powered gear and UPS.
 3. Rack three: Horizontal copper cable/ CPP's(CAT6/6A).
9. Wall field shall (WF) support 300pr. 110 type copper patch blocks with three vertical rows:
 1. Row one: Port of Seattle Backbone
 2. Row two: Tenant demarc 25pr cables
 3. Row three: Horizontal CAT 6/6a cables
10. Other wall field space considerations:
 1. WiFi Cable and equipment; typically one dedicated WF
 2. Cable Television cable termination and Distribution
 3. Security systems
 4. Point of entry of conduits and Cable Trays
 5. Door placement; minimum 3ft wide, no floor sill
 6. Power panel location

7. Telecommunications Grounding Busbar
4. Equipment rack or Destination cabinets, general information:
 1. The Standard Tenant Demarc is considered an extension of the POS communication backbone into a tenants' leased space.
 1. Standard Tenant Demarcation panel is a flush or surface mount 280 Enclosure (28.16" H x 14.3"W x 3.63" D) with a hinged door. Locations for the standard Demarc panel are typically concessionaires, small office spaces, etc. Refer to Appendix
 - a. Tenant equipment and horizontal cable shall terminate in second equipment panel adjacent to or above the Port equipment and connected with (2) 2" conduit. Second equipment box shall be within 15 feet of Port EQ
 - b. If Tenant Demarcation exceeds minimum cable infrastructure package, cabling may be pulled through Port EQ panel with one service loop in equipment panel then run to a tenant rack or cabinet for termination. Terminate any cables not needed in tenant rack or cabinet in Port Equipment panel.
 2. Refer to DMARC Gen3.1 appendix for tenant equipment rack/cabinet options
 3. Refer to DMARC Gen3.1 appendix for Tenant Demarc TIE cable requirements
 4. EXTERIOR communication cabinets or Micro Distribution Cabinet, see Appendix 14a & 14b
 1. Outdoor padmount communications terminal cabinet
 - a. Minimum size: 24"W x 66"H x 36"D
 - b. Doors front and rear; preferred with 3 point latch
 - c. Fabricated 0.125" aluminum mill finish; NEMA-3R U.L. enclosure label
 - (i) Facility conditions or Engineer's drawings may require Stainless steel
 - d. Top mounted exhaust fan
 - e. Fan thermostat
 - f. Louvered opening with accessible filter at bottom
 - g. 120 VAC receptacle, (2) 4-plex from two circuits
 - (i) (2) dedicated power circuits fed from nearest telecommunications electrical panel. Contact AV Maintenance or Marine Maintenance for specific details.
 - h. Rack mounted power distribution unit

- (i) MDC power distribution panels shall be placed in the bottom third of the rear of the cabinet. **Do not place power distribution panel on the top of the rear of the cabinet..**
 - i. Humidistat and Heater
 - j. Horizontal and/or Vertical wire management.
 - k. (4)-19" adjustable rack mount hardware fore and aft.
 - l. Pad lock with 4-59 key
 - m. (1) 24" X 24" X 6" "transitional" junction box shall be placed no farther than 15' from Port MDC. Transitional junction box shall accept all backbone and horizontal telecom conduits
 - n. (3) 3" conduits shall go between transitional junction box and Port MDC. This is to maintain the MDCs NEMA ratings, by limiting the amount of penetrations to the cabinet. Add 3-cell 3" fabric innerduct to conduits that are not at capacity, per fill ratio requirements.
 - o. All exterior conduit penetrations, power and comm, shall penetrate the bottom third of the MDC cabinets side panel. **Do not penetrate the roof of the cabinet.**
 - p. Telecom grade Condulet is allowed for conduit penetrations into the MDC cabinet.
 - q. All penetrations shall maintain NEMA rating of cabinet.
- 5. STANDARD TENANT DEMARCATION Enclosure shall house Port backbone cable only; minimum amounts listed given below. Contact POS for a standard Tenant Demarc drawing package, see Appendix 5.
 - 1. 12 strands of SMF
 - 2. 6 Category 6
 - 3. 2 Category 6a (This is an option for tenant)
 - 4. 1 RG-11 coaxial
- 6. SMALL TENANT DEMARCATION- Concept intended for small business operators or kiosks, must be approved by START Housing requirement is a Systimax M106 style 6-port surface mount box
 - 1. 6 Category 6 cables
 - 2. 12 single mode fiber strands- only required on a case by case need. Singlemode fiber option to be approved by START

7. BACKSTAND Communication Cabinet (FTBS). Contact POS for a standard Backstand drawing package. Minimum amounts of cable listed below.
 1. 24 strands of SMF
 2. 12 Category 6
8. Micro Distribution Cabinet (MDC) refer to 1.05.C.4.4 in this section for cabinet standard
 1. 36 strands of SMF
 2. 24 Category 6 cables
9. Tenant Demarcation Cabinet and cable are to be considered permanent infrastructure into leased space.
10. A minimum of one 2" conduit is placed from Tenant Demarcation Cabinet to the Port of Seattle ER which is located at or under 80m from Tenant cabinet.
11. MDC TIE cable requirements, between Port and tenant MDCs
 1. (24) single mode fiber
 2. (12) CAT6

1.06 EQUIPMENT CERTIFICATION

- A. Listed Equipment: All applicable material, including accessories to the system and including all wire and cable, shall be listed by an approved agency recognized by Washington State Department of Labor and Industries for the use intended i.e., UL, CSA, ETL, etc.
- B. Applicable standards compliance: In addition to the L&I approved listing agency, all communication equipment shall meet applicable portions of FCC, TIA/EIA, ANSI, and Telcordia Technologies (formerly Bellcore) standards for product performance and quality.

1.07 WARRANTY

- A. In addition to the warranty requirements specified in Section 01 78 36 - Warranties and Bonds, the Contractor shall provide an extended Systimax Solutions warranty as specified in Section 27 13 00 - Backbone Cabling Requirements.
- B. All installation and maintenance technicians shall be Systimax Solutions certified.

1.08 RECORD DOCUMENTS

- A. Record documents: Prepare record documents in which indicate the following installed conditions:
 1. Communication pathways, size and location, for both exterior and interior; and locations of control devices, patch panels, and equipment racks.
 2. Equipment locations (exposed and concealed) dimensioned from column lines.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

End of Section

Revision History:

05/01/2014 Conversion to 2004 CSI Numbering System

10/15/2014 Added Sole Source and Salient Characteristics Note to Part 2 and revisions

01/29/2015 Revised Sole Source

02/07/2017 Incorporated ICT edits, Removed Sole Source

12/31/2017 Revised the Demarc and External cabinet section, added Termination equipment details.

7/15/2021 Added requirements for recertification of existing infrastructure; updated UTP cable requirements; added requirements for common use workspaces and WAPs; updated requirements for FO cables; updated requirements for ER equipment; updated requirements for distribution cabinets and tenant demarks. Removed reference to air blown fiber.