READ THIS FIRST

Notice to the Design Engineer, please refer to the Port of Seattle, Facilities and Infrastructure standards for reference before editing this specification.

This Project Spec Document REQUIRES an approved Competition Waiver per [CPO-6](http://compass.portseattle.org/corp/legal/Documents/CPO-6%2001%2006%2010%20FINAL.pdf) for Systimax Solutions Communication Backbone Cabling (including UTP copper backbone and tie cables, UTP cat 6/6a copper termination hardware, fiber optic cable, fiber optic cable termination and splice hardware) and Horizontal Cables (including optic fiber cable, patch panels, connectors, couplers, UPT copper backbone, data patch panels, blocks, wall plates, boxes, jumper/patch cords).

This Project Spec Document may need additional modifications to suit your project. It is recommended that you proofread each section, paying attention to any “Notes” boxes such as this one--you should remove these “Notes” sections as you go. Also, do a search for all bracket characters “ [ ] “ as they are used to show you areas containing options or project specific details (you can use Microsoft Word’s Find feature {Ctrl-F} to jump to an open bracket “ [ “ character quickly). Again, these bracket characters should be removed.

It is important that every paragraph be numbered to allow for easy referencing. If you use the document’s built in styles and formatting your outline should be fine (turn on the formatting toolbar by going to View > Toolbars > Formatting). Most paragraphs will use the style “Numbered Material” and can be promoted (Tab) or demoted (Shift-Tab).

You should not have to manually enter extra spaces, carriage returns or outline characters such as A, B, C, or 1.01, 1.02; the formatting will do this for you. The entire document is 11 pt. Arial. If you paste items in, you may need to reapply the “Numbered Material” format.

1. GENERAL
   1. SUMMARY
      1. This Section covers general work of all Sections under Division 27. Drawings and general provisions of the Contract, including General and supplemental Conditions and Division 1 specifications sections, apply to this section.
      2. The Contractor shall comply with all requirements mandated under the Washington State General Services contracts for Signal Wiring and Cabling. The Contractor will comply with all applicable governmental regulations and with all local ordinances.
      3. The work covered by this Section consists of furnishing all materials, accessories, connectors, supports, electrical protection, equipment, tools, setup, preparation, labor, supervision, incidentals, transportation, storage and related items and appurtenances, and performing all operations necessary to complete the telecommunications work as indicated in the project drawings and specified herein. Completely install, connect, and test all systems, equipment, devices, etc. shown or noted or required to final connections and leave ready for satisfactory operation. Provide any minor items omitted from the design, but obviously necessary to accomplish the above intent.
      4. Any item not specifically shown on the drawings or called for in the specifications, but normally required to conform to the intent, are to be considered as part of the Contract.
      5. This 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).
         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. Splice fiber optic cable in communications spaces and terminate fiber optic cable in stand-alone controllers.
         8. Splice/Terminate copper cabling in communications spaces and connect to end devices.
         9. Provide testing of communication components and systems to meet Systimax Solutions warranty requirements and/or Port specifications. Coordinate with the Construction Manager for unshielded twisted pair (UTP) and fiber optic cable testing.
         10. Provide and install labels on fiber optic cable and UTP cables as specified; refer to Section 27 05 53 – Identification and Labeling.
         11. Contractor to provide as-built labeling, drawing information and warranty certificates to Port of Seattle within (3) weeks of project completion.
         12. Coordinate with the Construction Manager and other contractors for use of existing cable pathways (cable trays and conduit) to install portions of the fiber optic cabling.
         13. Comply with low-voltage grounding specifications per Sections 26 05 26 –Grounding and 27 05 26 – Grounding and Bonding for Communications Systems.
   2. GOVERNING CODES, STANDARDS AND REFERENCES
      1. The installation shall comply fully with all government authorities, laws and ordinances, regulations and codes applicable to the installation
      2. Should any change in plans or specifications be required to comply with governmental regulations, the Contractor shall notify the Owner at the time of submitting the Shop Drawings.
      3. Local electrical and building codes may differ with national codes. Follow the most stringent code or recommendations. Where there are instances of ambiguity refer to the Owner/Engineer for interpretation.
      4. All equipment shall be equal to or exceed the minimum requirements of NEMA, IEEE, ISO, ASME, ANSI, and Underwriters’ Laboratories.
      5. Comply with the following Standards and Codes:
         1. The latest published edition of a reference shall be applicable to this project unless identified by a specification date.
         2. Building Industry Consulting Service International (BICSI) Telecommunications Distribution Methods Manual, current edition.
         3. American National Standards Institute /Telecommunications Industry Association (ANSI/TIA)
            1. ANSI/TIA-568-C.0 Set Generic Telecommunications Cabling for Customer Premises
            2. TIA/EIA-569 Commercial Building Standard for Telecommunications Pathways and Spaces
            3. TIA/EIA-606 Administration Standard for Commercial Telecommunications Infrastructure
            4. J-STD-607-B Telecommunications Grounding and Bonding for Customer Premises
         4. Federal Communications Commission Title 47
            1. FCC Part 15
            2. FCC Part 68
         5. Institute of Electrical and Electronic Engineers IEEE 802.3
         6. NEMA VE 1 Metallic Cable Tray Systems
         7. ISO/IEC 11801 International Organization for Standardization
         8. National Electrical Manufacturers Association (NEMA)
         9. National Electrical Safety Code (NESC)
         10. National Fire Protection Association (NFPA)
             1. NFPA 70 National Electrical Code (NEC)
             2. NFPA 75 Protection of Electronic Computer / Data Processing Equipment
             3. NFPA 101 Life Safety Code
         11. Federal Occupational Safety and Health Administration
         12. OSHA Standards 29 CFR 1926 and 1910
         13. Underwriters Laboratories, Inc.
             1. UL Listed
             2. UL Approved
         14. Port of Seattle Cabling Specifications for New Installations
   3. SUBMITTALS
      1. General Procedures
         1. 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.
      2. List of Submittals
         1. Pre-Construction Submittals:
            1. Product data sheets
            2. Shop drawings
            3. Factory tests
            4. Proof of certification as a certified installer for the system(s) to be installed.
            5. Proof of project registration with system manufacturer(s) for extended warranty.
            6. Manufacturer product and application wiring for approval.
         2. During Construction:
            1. Installation/commissioning schedules
            2. Pull schedules and floor plans with outlet IDs
            3. Field test reports
         3. Commissioning:
            1. Commissioning plans
            2. Method statements
            3. Testing and commissioning schedules
         4. Post Construction:
            1. As-built drawings (both hardcopy and softcopy)
            2. Warranties
            3. O&M Manuals
      3. Product Data Sheets
         1. Product Data Sheets shall include construction details, material descriptions, dimensions of individual components and profiles and finishes. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
         2. Certify that the data sheets depict the components to be installed to make up the complete system as described in the Contract Documents.
      4. Samples
         1. Submit samples of cables and outlets fully labeled and other accessories to be installed under these Contract Documents.
         2. Provide samples physically identical with proposed material or product.
         3. Where selection is required, provide full set of all options.
         4. Where non-specified products are proposed, provide full set of all options.
      5. Shop Drawings and Calculations
         1. Diagrams showing evidence of compliance with Contract Documents and coordination with other trades.
         2. Associated wiring diagrams of all equipment, with types and model numbers specified under these Contract Documents.
         3. Submit drawings (to scale) showing:
            1. Point-to-point wiring diagrams for all cables installed under this work.
            2. Detailed plan views and elevations of all telecommunications spaces showing racks, termination blocks and cable paths.
            3. Equipment and wall elevations, mounting locations and dimensions and labeling of equipment.
            4. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
            5. Equipment Racks and Cabinets: Include workspace requirements and access for cable connections.
            6. Grounding: Indicate location of grounding bus bar and its mounting detail showing standoff insulators and wall mounting brackets.
            7. Drawings to show evidence of coordination with other trades.
            8. Sample reports showing the proposed format for cable test reports.
            9. Fully dimensioned housing and mounting drawings, including information on finishes.
            10. Specific notation of field measurements at accurate scale.
            11. Identification of specific products and materials used.
            12. Cross-reference all related Contract Documents (drawings, detail numbers, Specifications sections, etc.)
            13. Compliance with specified standards.
            14. Dimensions at accurate scale.
         4. Submit calculations for:
            1. Confirmation of pathways sizing
            2. Radio/WLAN coverage
            3. Grounding
            4. Seismic restraint components
      6. Pull Schedules
         1. Schedule fields shall reflect labeling fields.
         2. Schedule fields shall include, as appropriate:
            1. Sequential line number
            2. Outlet labeling
            3. Cable labeling
            4. Cable length
            5. Jack labeling
            6. Patch Panel/Termination Frame label
            7. Position/port numbers
            8. Rack labeling
      7. Factory and Field Test Reports
         1. Component test results as specified.
         2. Preparation and Transmittal:
            1. During construction submit hardcopies printed in a summary format showing one line item per cable tested for all cables. Each line must show the full cable label, test type, cable length, date and time tested and the test result, sorted by cable label. Submit hardcopies of the full test result printout for the cables of the furthest two and closest two outlets. Submit a softcopy of the complete test results of all cables tested.
            2. Submit test results no later than (5) days after the date of testing.
            3. Post construction submit hardcopies of both the summary and full test format for all cables installed, sorted by cable label. Submit a softcopy consisting of the complete test results.
            4. Submit manufacturer’s test record for each reel of cable delivered to the project copies of such data are to be kept for inclusion in the documentation and made available to the owner/owner representative upon request.
      8. As-Builts (Record Documents)
      9. Operation and Maintenance Manuals (O&M Manuals) including wiring diagrams, parts lists, shop drawings and manufacturers’ information on all equipment and cables provide by the Contractor.
         1. Submit (2) sets of O&M Manuals to the Owner not more than (1) week after project completion. Manuals shall be provided in a high quality, 3-ring binder and completely indexed. In addition softcopies shall be provided in PDF format.
      10. Qualifications
          1. Qualification Data: For Installer, qualified layout technician, installation supervisor, and field inspector.
          2. Seismic Qualification Certificates: For floor-mounted cabinets, brackets, mounts, cable trays, accessories, and components, from manufacturer.
             1. Refer to Division 26 Section 26 05 48 – Seismic Controls for Electrical and Communication Work for additional seismic qualification certificates.
             2. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
             3. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions. Base certification on the maximum number of components capable of being mounted in each rack type. Identify components on which certification is based.
             4. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements
          3. Resubmittals will be reviewed for compliance with comments made on the original submittal only and should be marked with a resubmittal number and dated.
   4. ADMINISTRATIVE REQUIREMENTS
      1. Coordination
         1. Carefully check space requirements and the physical confines of the area of work to insure that all material can be installed in the spaces allotted thereto, including conduits and cable supports.
         2. Transmit to the Owner in a timely manner all information required for coordinating and related work to be provided in ample time for installation.
         3. Contractor shall note that the construction schedule may dictate that work must be carried out simultaneously on more than one floor, in more than one building.
         4. Attend weekly construction meetings, at the project site or other location, as requested by the Engineer, and or Owner/Owner’s representatives. Contractor must ensure that a senior level manager attends the meetings – not just the onsite foreman.
         5. The Contractor shall, without extra charge, make reasonable modifications (coordinated with Owner) in the layout as needed to meet field conditions, prevent conflict with work of other trades, or for proper compliance with the design intent.
         6. The Contractor shall coordinate with the Owner with sufficient lead-time to ensure access to secure office and lab spaces, and to schedule work to avoid disturbing existing functional spaces – preferably by performing disruptive work at night/early morning hours.
         7. Coordinate arrangement, mounting, and support of communications equipment:
            1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
            2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
            3. To allow right of way for piping and conduit installed at required slope.
            4. So connecting pathways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.
         8. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.
         9. Coordinate location of access panels and doors for communications items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 8.
         10. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 7 Section 07 84 00 – Firestopping.
   5. PORT OF SEATTLE INFRASTRUCTURE
      1. Unshielded twisted pair cable (UTP cable)
         1. The following UTP cables shall be utilized for Port of Seattle HORIZONTAL runs:
            1. (2) Data information outlets per Quadplex (use two blanks in bottom outlets for future additions) for desktop/staff within 100 SqFt. or less of office or cubicle space.

Over 100 SqFt of Office space, place (2) Quadplex with (2) Data information outlets per Quadplex. Position on opposing walls where possible.

Over 100 SqFt of Cubicle space, place (1) Quadplex with (4) Data information outlets per Quadplex if space warrants possibility of multiple users/excessive equipment per cubicle.

For standalone equipment locations such as network printers, phones and cameras (2) Data to a Duplex outlet is required. Termination hardware can vary for these applications, but note that field termination to a male RJ-45 will not be accepted.

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.

* + - * 1. Common Use workstations, such as ticketing counters, gate counters, podiums, and BGR (Boarding Gate Reader) scanners, to receive (4) CAT6 data information outlets per quadplex outlet.
        2. Terminal Wide Voice Paging Microphone Stations at gates to receive (2) CAT6 data cables and shall be terminated at the nearby backstand.
        3. Data circuits: 4-pair Category 6/6a (Cat 6/6a)

Terminate Source (Port Communication Rm.)

Existing CIBS ERs - conform to existing hardware layout, unless otherwise directed by START. Hardware options are as follows(note-GS3= CAT6 and GS6= CAT6A)

Systimax PatchMax patch panel PM-GS3-24

Systimax 360 PatchMax patch panel 360-PM-GS3-2U

Systimax 360 Evolve 1100GS3 24-port flat patch panel

Systimax 360 Evolve 1100GS3 48-port flat patch panel

Systimax 360 Evolve 1100GS3 24-port angled patch panel

Systimax 360 Evolve 1100GS3 48-port angled patch panel

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)

Systimax 360 Evolve 1100GS3 24-port angled patch panel

Systimax 360 Evolve 1100GS3 48-port angled patch panel

Terminate Destination end of CAT6 Systimax GigaSPEED XL; MGS400 (Red) information outlet.

Terminate Destination end of CAT6A cables (WiFi) cables; MGS600 (Orange) information outlet.

* + - * 1. Legacy analog Voice circuits: 4-pair Category 6

Terminate Source (Port Communication Rm.) to Systimax 300pr. 110 wiring block; 110AW2-300. Utilize 110C connecting blocks.

Terminate destination end to Systimax GigaSPEED XL; MGS400 (Yellow) information outlet.

* + - 1. The following UTP cables shall be utilized for Port of Seattle BACKBONE cable infrastructure:
         1. Voice circuits (Inside plant only): 25-pair Category 5/5e (Cat 5/5e) 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)

Terminate Source (Port Communication Rm.) to Systimax 300pr. 110 wiring block; 110AW2-300. Utilize 110C connecting blocks, (5) C5’s per row.

Terminate Destination\* to Systimax 110 wiring block; Destination termination equipment varies per application; refer to engineered drawings.

(\*) Port communication rooms shall use same termination equipment noted in (1) above at the Source and Destination

OSP applications shall follow required protector panel setup at each end of cable

* + - * 1. Data circuits: 4-pair Category 6 (Cat 6) for TENANT Demarcation Backbone Equipment panel; minimum (6) Cat 6.
        2. 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.
    1. Fiber Optic infrastructure (FO cable)
       1. The following FO cables shall be utilized for Port of Seattle HORIZONTAL applications such as Fiber directly to Equipment or future Fiber to the Desktop needs; minimum fiber to be installed is 6 strands. Strands terminated shall be specified on engineered plans or directed by the Port of Seattle.

Fiber Horizontal (FH): 6 strand Single Mode Fiber (SMF) Terminate Source (Port Communication Rm.) Existing environments to accept:

Systimax SC duplex connectors

OFS 144 port, 5 RU Fiber Optic shelf, w/ (6) 24 strand adapter panels

New environments to accept:

Systimax LC duplex connectors

Systimax 1000G2 Fixed Fiber Shelf (or approved Commscope/ Systimax equal)

Destination termination equipment varies per application; refer to engineered drawings.

As required, utilize necessary Fiber optic cables, patch panels, splice shelves, adapters, connectors, buffer kits, breakout kits, consumables, and accessories.

Consideration shall be given to Air Blown Fiber (ABF) applications where projects fit a scalable need over time or technology demands an adaptable install such as ICT Data Centers. Manufacturer shall have a certified ABF installer program; installers shall have valid certification from ABF Manufacturer. ABF shall have the ability to physically terminate to Systimax patch panel hardware to maintain existing cross connect fiber patch cord usage, architectural aesthetics and end user ergonomics established in the Port of Seattle communication rooms. Installed Fiber shall provide a minimum 20 year warranty.

* + - 1. 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. Minimum fiber to be installed is 12 strands, fully terminated.
         1. Minimum Fiber Backbone (FB): Minimum strand count is 12 strands Single Mode Fiber (SMF). Note: This is the minimum FB for a Tenant Demarcation package
         2. Terminate SMF first in any Fiber Optic Patch Panel (FOPP)

Terminate Source (Port Communication Rm.) New and existing environment options are as follows:

Existing environments to accept

Systimax SC duplex connectors

OFS 144 port, 5 RU Fiber Optic shelf, w/ (6) 24 strand adapter panels

New environments to accept

Systimax LC duplex connectors

Systimax 1000G2 Fixed Fiber Shelf (or approved Commscope / Systimax equal)

Destination termination equipment\* varies per application; refer to engineered drawings.

(\*) Port communication rooms shall use same termination equipment noted in (1) above at the Source and Destination.

As required, utilize necessary Fiber optic cables, patch panels, splice shelves, adapters, connectors, buffer kits, breakout kits, consumables, and accessories.

Consideration may be given to Air Blown Fiber (ABF) applications where projects fit a scalable need over time or technology demands an adaptable install such as ICT Data Centers. Manufacturer shall have a certified ABF installer program; installers shall have valid certification from ABF Manufacturer. ABF shall have the ability to physically terminate to Systimax patch panel hardware to maintain existing cross connect fiber patch cord usage, architectural aesthetics and end user ergonomics established in the Port of Seattle communication rooms. Installed Fiber shall provide a minimum 20 year warranty.

* + 1. 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’ x 15’).
          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’ 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’ x 6’; 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’ x 15’ to allow for growth and equipment changes throughout life of the ER.

Refer to [Communications Systems Standards](http://www.portseattle.org/Business/Construction-Projects/Airport-Tenants/Documents/design_standards/CommStandards2018.zip) appendix 13 for rack elevation

* + - * 1. 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’ above finished floor.
        2. Ladder rack shall cross parallel and centered over each row of racks.
        3. 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.
        4. HVAC required to maintain a room temperature of 70°.
        5. Equipment Racks (EQ): Minimum of three open frame 7’ tall, 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:

Rack one: All Fiber Optic terminations/FOPP’s

Rack two: Active Network Equipment, other powered gear and UPS

Rack three: Horizontal copper cable/CPP’s(CAT6/6A)

* + - * 1. Wall field shall (WF) support 300pr. 110 type copper patch blocks with three vertical rows:

Row one: Port of Seattle Backbone

Row two: Tenant demark 25pr cables

Row three: Horizontal CAT 6/6a cables

* + - * 1. Other wall field space considerations:

WiFi Cable and equipment; typically one dedicated WF

Cable Television cable termination and distribution

Security systems

Point of entry of conduits and Cable Trays

Door placement; minimum 3’ wide, no floor sill

Power panel location

Telecommunications Grounding Busbar

* + - 1. Equipment rack or cabinet Destination, including use for Tenant Demarcation package; general information:
         1. The Standard Tenant Demarcation is considered an extension of the POS communication backbone into a tenant’s leased space.

Standard Tenant Equipment 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 panel are typically concessionaires, small office spaces, etc.

Refer to [Communications Systems Standards](http://www.portseattle.org/Business/Construction-Projects/Airport-Tenants/Documents/design_standards/CommStandards2018.zip) appendix

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” of Port EQ.

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.

Refer to [Communications Systems Standards](http://www.portseattle.org/Business/Construction-Projects/Airport-Tenants/Documents/design_standards/CommStandards2018.zip) DMARC Gen3.1 appendix for tenant equipment rack/cabinet options and TIE cable requirements

b. EXTERIOR communication cabinets or Micro Distribution Cabinets

Refer to [Communications Systems Standards](http://www.portseattle.org/Business/Construction-Projects/Airport-Tenants/Documents/design_standards/CommStandards2018.zip) Appendix 14a & 14b

Outdoor padmount communications terminal cabinet

Minimum size: 24”W x 66”H x 36”D

Doors front and rear; preferred with 3 point latch and blue construction core.

Fabricated 0.125” aluminum mill finish; NEMA-3R U.L. enclosure label

Facility conditions or Engineer’s drawings may require Stainless steel

Bottom conduit entry; START to approve variances

Top mounted exhaust fan; must be accessible for maintenance purposes.

Fan thermostat

Louvered opening with accessible filter at bottom.

120 VAC receptacles, (2) 4-plex from (2) circuits, located in upper interior of cabinet.

Rack mounted power distribution unit

Humidistat and Heater

Horizontal and/or vertical wire management.

(4)19” adjustable rack mount hardware fore and aft;

Pad lock with 4-59 key

* + - * 1. STANDARD TENANT DEMARCATION enclosures shall house Port backbone cable only; minimum amounts listed:

Refer to [Communications Systems Standards](http://www.portseattle.org/Business/Construction-Projects/Airport-Tenants/Documents/design_standards/CommStandards2018.zip) Appendix 5

12 strands of SMF

(6) Category 6

[(2) Category 6a] (optional)

1 RG-11 coaxial

Layout of termination hardware available within Port Standards

* + - * 1. SMALL TENANT DEMARCATION- Concept intended for small business operators or kiosks, must be approved by START; houses Port backbone CAT6 only. Housing requirement is a Systimax M106 style 6-port surface mount box

(6) Category 6

* + - * 1. BACKSTAND Communication Cabinet (Fiber To BackStand, or FTBS). Contact POS for a standard Backstand drawing package. Minimum amounts of cable listed below.

24 strands of SMF

(12) Category 6

* + - * 1. Micro Distribution Cabinet (MDC) refer to 1.05.C.4.4 in this section for cabinet standard

36 strands of SMF

(24) Category 6

* + - * 1. Port Tenant Demarcation Cabinet and cable are to be considered permanent infrastructure into leased space.
        2. 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.
  1. QUALITY ASSURANCE
     1. All products shall be installed new, best of their respective kinds, free from defects, listed by Underwriter’s Laboratories for the intended use, and bearing their label.
     2. Any given item of equipment or material shall be the product of one manufacturer throughout the facility. Multiple manufacturers of any one item will not be permitted, unless specifically noted otherwise.
     3. Obtain from the manufacturers detailed instructions for installation of that manufacturers’ products.
     4. Ensure that all components meet all regulatory requirements for the respective component being used.
     5. All products, services and materials provided and performed under the scope of this Specification shall conform to the manufacturer’s requirements.
     6. Contractor is solely responsible for quality control of the Work and must comply with the Quality Control requirements specified herein.
     7. All materials shall be new and unused and free from defects. All materials shall meet all applicable codes provided a standard has been established for the material in question.
     8. Provide quality assurance plans for contractor furnished and installed equipment and for Owner furnished and Contractor installed equipment. Plans shall describe how equipment is received, pre-installation tested, installed, post-installation tested, commissioned, etc.
     9. All products and materials to be clean, free of defects, and free of damage and corrosion.
     10. Installation Qualifications:
         1. In order to provide proper coordination, uniform quality and system integrity, the equipment and installation specified within this Specification shall be provided and installed by a single contractor with a proven track record in the field of the specified system. Personnel shall be competent and qualified by experience and training for the installation.
         2. Contractor shall be trained and certified by the manufacturer of the proposed system as a Certified Installer. A copy of the certificate shall be included with the bid.
         3. Upon award of the project and prior to the commencement of work, provide evidence that the General Foreman, Foreman or Crew Leader of the installation crew holds the designation of BICSI Technician, and that thirty- three percent (33%) of the installers have completed the BICSI Installer Level 1 or greater. The certificates of at least one BICSI Technician and one BICSI Installer Level 1 or 2 shall be submitted with the bid documents.
  2. SUBSTITUTIONS, DEVIATIONS AND CHANGES
     1. Substitutions
        1. Requests for substitutions are only permitted for materials specified with an “or approved equal” clause or other language of same effect in the Contract Documents. Substitutions for the main system components shall be equivalent products from one of the manufacturers included in the list of approved manufacturers.
        2. The systems specified in this document shall be an end-to-end solution that is sourced from a single manufacturer or partnered manufacturers.
        3. Any proposed substitution in whole or part, must be submitted for review and approval.
        4. Any proposed substitutions shall conform to the Contract Documents. Supply proof acceptable to the Owner in the form of a written guarantee that the substituted product(s) meet or exceed the Specifications. The substitution must be accepted in writing by the Owner.
     2. Deviations
        1. Any deviations or changes involving extra work are not permissible without prior review and written approval by the Owner.
  3. DELIVERY, STORAGE AND HANDLING
     1. Protect from loss or damage. Replace lost or damaged materials and equipment with new at no increase in Contract Sum.
     2. Contractor will receive, handle, store, secure, maintain and be responsible for Owner furnished equipment until installed and accepted by Owner.
  4. EXTRA MATERIALS
     1. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  5. CERTIFICATION AND WARRANTY
     1. All work and all items of equipment and materials shall be warranted for a minimum period of one year from the date of acceptance of the work. Where a manufacturer’s warranty is longer than one year, the Contractor shall offer the extended warranty. The Contractor shall, upon notification of any defective items, repair or replace such items within 24 hours without cost to the Owner, all to the satisfaction of the Owner/Engineer.
     2. Furnish a warranty in accordance with any General Conditions
     3. Furnish a manufacturer’s “Permanent Link” performance warranty for all EIA/TIA 568-B Category 6 workstation cables for a minimum period of 25 years from the date of acceptance of the work. Where a manufacturer’s warranty is longer than 25 years, the Contractor shall offer the longer warranty. The “Permanent Link” Performance Warranty shall be issued and signed by the component manufacturer and shall list the Owner as the holder of the warranty. The “Permanent Link” Performance Warranty shall cover labor and material for all “Link” components. Describe as part of the bid response, in consideration of the product set submitted in your bid response, your ability of offer such a manufacturer’s extended warranty.
     4. 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.
     5. 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 Tellcordia Technologies (formerly Bellcore) standards for product performance and quality.
     6. 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 – Communications Backbone Cabling.
     7. All installation and maintenance technicians shall be Systimax Solutions certified.
  6. RECORD DOCUMENTS
     1. 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.

1. PRODUCTS - NOT USED

A. If only one product is acceptable (single or sole source product), obtain an approved Competition Waiver and submit to the CPO Construction, Contract Administrator. The language shall read as: “Manufacturer Name, Product # XXXXX, No Equal.” Refer to CPO-6 Competition Waiver Policy for more information.

B. If a Competition Waiver is not approved or more than one product is acceptable, this section must list a minimum of 2 products plus the language “Or Approved Equal,” along with salient characteristics. Refer to CPO Construction’s Salient Characteristics Guidelines for more information.

1. EXECUTION
   1. COMMON REQUIREMENTS FOR COMMUNICATIONS INSTALLATION
      1. Comply with NECA 1.
      2. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
      3. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
      4. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both communications equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
      5. Right of Way: Give to piping systems installed at a required slope.
      6. Cutting, patching, painting and restoration of any existing surfaces damaged performing the work under the scope.
   2. SLEEVE INSTALLATION FOR COMMUNICATIONS PENETRATIONS
      1. Communications penetrations occur when pathways, cables, wireways, or cable trays penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
      2. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
      3. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
      4. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
      5. Cut sleeves to length for mounting flush with both surfaces of walls.
      6. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.
      7. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pathway or cable, unless indicated otherwise.
      8. Seal space outside of sleeves with grout for penetrations of concrete and masonry
         1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
      9. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and pathway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 7 Section 07 92 00 – Joint Sealers.
      10. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pathway and cable penetrations. Install sleeves and seal pathway and cable penetration sleeves with firestop materials. Comply with requirements in Division 7 Section 07 84 00 – Firestopping.
      11. Roof-Penetration Sleeves: Seal penetration of individual pathways and cables with flexible boot-type flashing units applied in coordination with roofing work.
      12. Aboveground, Exterior-Wall Penetrations: Seal penetrations using [steel] [cast- iron] pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1- inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
      13. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between pathway or cable and sleeve for installing mechanical sleeve seals.
   3. SLEEVE-SEAL INSTALLATION
      1. Install to seal exterior wall penetrations.
      2. Use type and number of sealing elements recommended by manufacturer for pathway or cable material and size. Position pathway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pathway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
   4. IDENTIFICATIONS
      1. Refer to Division 27 Section 27 05 53 – Identification and Labeling.
      2. Comply with TIA/EIA-606-A.
      3. Comply with requirements in Division 26 Section 26 05 53 – Electrical Identification.
   5. GROUNDING
      1. Refer to Division 27 Section 27 05 26 – Grounding and Bonding for Communications Systems.
      2. Comply with ANSI-J-STD-607-A
      3. Comply with requirements in Division 26 Section 26 05 26 – Grounding.
   6. FIRESTOPPING
      1. Apply firestop systems to penetrations of fire-rated floor and wall assemblies for communications installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 7 Section 07 84 00 – Firestopping.
2. MEASUREMENT AND PAYMENT
   1. GENERAL
      1. No separate measurement or payment will be made for the Work required by this section. The cost for this portion of the Work will be considered incidental to, and included in the payments made for the applicable bid items in the [Schedule of Unit Prices] [Lump Sum price bid for the Project].

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

10/11/2018 Updated Specification to current standards, renamed and changed section number.