270000-TC
Common Work for Telecommunications Systems

Related Documents
The following related sections of the OT standards shall also be applicable to this section.

OT Engineer shall approve all product cut sheets prior to purchasing and installation by contractor. Reference S9 Approved Products.

S1 Approved Product Request
S1 Change Request
S1 Request for Variance
S1 Resource Allocation Permit
S2 Introduction
S3 SOP and Policy
S4 275116-TC CORE Passenger Communications Paging System
S4 275118-TC Emergency Communications and Evacuation Paging System
S5 270000X Telecommunications Systems (Boiler Plate)
S5 MAA Radio System
S7 270100-TC Systems Cabling
S7 270101-TC COMCAST Standard
S7 270526-TC Grounding and Bonding
S7 270528-TC Hangers and Support
S7 270553-TC Identification
S7 270555-TC OT Facility Warning Standard
S7 271116-TC Cabinets Racks Frame Enclosures
S7 271119-TC Termination Blocks and Patch Panels
S7 271313-TC Cable Splicing and Termination
S7 271323-TC Optical Fiber Splicing and Terminations
S7 271519-TC Horizontal Cabling
S7 271525- TC Tenant and Airlines Extended DEMARC
S7 271543-TC Faceplates and Connectors
S7 271600-TC Telecommunications Station Equipment
S7 271601-TC Courtesy Phone Backboard
S8 E911 PS ALI Standard
S9 Approved Products

Part 1 - General Introduction

A. The work shall consist of the design, provision, termination, testing and documentation of a complete and fully functional structured cabling and optical fiber communications cabling system. The instructions in this section are specific to communications installations and should be read in conjunction with other contract documents as applicable.

B. MAA/OT has communications specifications specific to MAA/OT.

Part 2 - Qualifications

A. Cabling system design work detailed in this section shall be carried out by a BISCI Certified RCDD.

B. Cabling system installation work detailed in this section shall be carried out by a specialist installer company. The installer shall be certified by BISCI in the installation and testing of the cabling system, and have a BISCI ITS Technician on site to over see the installation.

C. The installer shall have a proven track record in the field of structured cabling system installation. The installer shall have completed at least three previous installations of comparable size, complexity and manpower within the last three years. Each installation shall utilize components, installation practices and testing procedure equivalent to those specified in this document.

D. All tests shall be performed by a qualified technician proficient in the use of the required test equipment

Part 3 - Definitions

A. Provide: Supply, furnish, deliver, install, pull, fix, dress, terminate, label, test, ground, fire stop, and document the components as per these specifications.

B. Backbone Cables: Cables linking the MDF and IDFs located through out the complex.

C. Outside Plant OSP: Cables that link the building to external connection point(s) and/or other building(s).

D. Inside Plate (ISP): Cables that link the internal facilities to internal facility connection point(s)

E. Station Cables: Cables linking workstation outlet to active equipment.

F. Patch Cables: Cables linking Distribution Frame Patch Panel terminations with active electronics or another Patch Panel termination.

Part 4 - Scope of Work

The work shall consist of the furnishing, installation, termination, testing and documentation of a complete and fully functional structured communications cabling system.

DCI shall perform a 1% (one percent) test of all copper and fiber facilities installed. This 1% test shall be submitted to the OT engineer for review and approval of testing means and methods prior to final testing.

The work shall include the following (as identified within these documents and associated drawings):

Provision of external optical fiber and copper cabling, except as specified by MAA/OT.

Splicing external grade cables to internal grade cables.

Provision of internal optical fiber and copper backbone, link and distribution cables.

Provision of coaxial CATV television system cabling, if required. Termination of each optical fiber element with optical fiber connectors mounted in patch panels, termination frames and/or outlet faceplates.

Termination of each copper cable with connectors mounted in patch panels, termination frames and/or outlet faceplates. Provision of equipment cabinets, racks, cable management and all accessories.

Provision of patch cords, station cables and cross-connect wires, except as specified by MAA/OT.

Full labeling of the entire installation prior to testing.

Testing of each optical fiber element and connector with Power Meters and OTDR.

Testing of each copper cable and connector with a level IV tester. Documentation of the installation, including test results, cable management records and as-built documents in native, source or raw electronic format.

Provide and install all incidental items that belong to the Work described and which are required for a complete system.

Entire copper cable plant shall be certified.
Entire fiber cable plant shall be certified.

Part 5 - Works not included

A. The work detailed in this section shall not include the following:

1. Provision of active networking equipment (electronics) and computer terminals unless specifically specified.
2. Installation and physical connection of active network electronics to cable plant.
3. Provision of telephone equipment and associated services.
4. Installation and physical connection of active telephone equipment to cable plant.

Part 6 - Manufacturer's Complete Systems

A. Refer to S9 Approved Products for approved products

B. DCI shall note that all components shall meet or exceed the performance requirements detailed within these specifications.

C. MAA/OT reserves the right to review and approve all submittals prior to ordering, and reject any substitution on the grounds of adherence to standards, quality, performance, utility, function and/or appearance.

Part 7 - Personnel

A. The Installer shall provide a site manager BISCI ITS Technician responsible for all site-related issues. This individual shall be the single point of contact for the project team and shall carry a mobile phone so they can be contacted during the working hours of the project or have an alternate POC.

B. The Installer shall have a Registered Communications Distribution Designer (RCDD) as a permanent member of staff. The RCDD shall be in good standing with the Building Industry Consulting Service International (BICSI) and shall have a current registration. The RCDD must be available for weekly meetings or as needed to facilitate system installation and address MAA/OT's needs and concerns.

C. The Installer shall be certified by the component manufacturer(s) in the installation and testing of the cabling system and shall be able to provide a manufacturers' extended performance warranty for the

‘end to end’ cabling system.

7.2 Coaxial Cabling

A. Coaxial cable system shall support 5MHz through 1GHz frequency ranges or as specified and approved by OT Engineer.

B. Faceplate, jack colors and other aesthetic issues must be approved by MAA/OT prior to installation.

Part 8 - Submittals

1. All submittals shall be approved by MAA/OT prior to purchase or installation.

Part 9 - Personnel Training

A. Submit for approval current RCDD registration certification for the RCDD or RCDDs that are part of the Installers staff. This documentation shall clearly show that the registration is current. A currently certified RCDD is required for the duration of the project.

B. Submit for approval records regarding the management, installation and testing personnel. These records shall include resumes, training certificates, previous work experience details (especially on reference projects) and other relevant information.

C. Submit records to confirm that the personnel who will be employed in an installation capacity are suitably trained in the installation and maintenance of equipment and systems of the type being provided.

D. Submit records to confirm that the personnel that will be responsible for testing the system are suitably trained in the operation of the test equipment being used in this project.

Part 10 - Communications Manholes

A. Provide a 12’-0” service loop where possible for each external cable that passes through a communications manhole. Dress the cable to keep it clear from any water that may be in the bottom of the manholes and to minimize any risk of damage caused by later visits to the manhole.
Provide bushings, grommets and strain-relief for cables terminating at wall-mounted outlets and patch panels to ensure durable and robust connections. The bushings and grommets are intended to protect the cables from any sharp edges that present a risk to the cables. Ensure that all sharp edges are covered to protect the cables from damage.

Part 11 - Installation Practices

11.1 General

A. Installation practices are detailed in order sections of the Telecommunications Specification. This section pertains to MAA/OT specific concerns regarding cable plant installations. If there is a conflict or question regarding which method to apply, contact MAA/OT for clarification.

11.2 Specifics

A. No cables shall be installed in a fashion that contravenes either the minimum installed or the minimum under-load bend radius of the cable.

B. All inner ducts shall run parallel or at right angles to building wall structures. Provide a support system for inner duct running in the ceiling void. Do not allow inner duct to rest on electrical or mechanical equipment. Do not tie inner duct to power or other foreign services. Support inner duct running in the vertical and horizontal direction in place at not more than 12" and 48" centers respectively.

C. No cable is to be pulled through a conduit “L-bend” (condulets). In existing routes with L-bends, the cables are to be pulled to the L-Bend. The cable is then to be carefully pulled through the remainder of the conduit run.

D. Install all cables in complete runs from outlet or patch panel to patch panel. In-line joints, splices, distribution points or other intermediate connections are not permitted unless specifically called out by this specification.

E. At no point shall the communications cables be tied to power cables or other building services or their supports, or run in the same ducts, raceways, conduits or connection boxes as power cabling. Copper data cables

must maintain the specified distance separation from electrical lines and conduits per Industry specification.

F. Use plenum-rated tie wraps in plenum spaces. All tie wraps shall be secured in such a way that it can be rotated around the cable bundle, so as to assure no cables have been cinched too tight.

G. Reinstate all pull-wires in conduits and ducts after use to facilitate future addition of cables.

H. Cables shall not be held so tightly with cable ties that the cable jackets are indented by the cable ties.

I. Individually and properly ground all equipment cabinets, racks and ladder rack. Ground all metallic sheath communications cables entering the building per manufacturer specifications and NEC 770-33, 800-33, 800-40 and EIA/TIA-607 (or newest EIA/TIA code which supersedes these).

J. Ensure that all waste materials are disposed of in a safe manner. Pay particular attention to waste materials produced during the termination of optical fiber cabling. Ensure that all used components and fiber cut-offs are collected in purpose-made containers and disposed of properly.

K. Replace all moisture and fire barrier material in ducts, conduits and other penetrations disturbed during installation of communications cabling. Install barrier material in all fire-rated penetrations that have cabling running through them. The barrier material shall be installed so the final penetration has the same fire rating as the original wall/floor. No mixing of materials when fire stopping.

L. Provide expansion plugs in all ducts/conduits entering the building. Seal all unused ducts/conduits with plugs that allow the pull-string to be tied off on the inside.

M. Use purpose-built pulling grips during cable installation. Do not pull cables by attaching pull wires to cable jackets, elements or reinforcement. Use strain gauges or equivalent measures to ensure that the maximum tensile load rating of the cables is not exceeded during installation.

N. External Cables shall be run in underground ducts. Ducts shall be proven to be clear prior to pulling of cables by the DCI

O. Cable pulling tension shall not exceed manufacturer’s limits. The cable pulling tension shall be applied smoothly without jerks and at no time shall it exceed the manufacturer’s limits.

P. The pulling equipment for pulling external cables shall be arranged either to indicate the pulling tension, which shall be continually monitored during a pull, or shall mechanically, assure that the maximum permissible tension is not exceeded.

Q. The number of cables in each conduit shall be controlled to allow for future cable installation and to stay within the manufacturer's maximum allowable cable pulling tension. Conduit fill ratios shall not exceed 40%.

R. The maximum run length of each distribution cable shall not exceed the 90m limit specified by EIA/TIA 568B horizontal cables. Notify MAA/OT immediately if, due to on-site conditions or other factors, a distribution cable runs length exceeds this distance.

S. Provide Hook and Loop (Velcro) strapping for all cable bundles within all Communications Rooms cut to length according to manufacturer's specification for strength is recommended. Straps are to be placed at 3 foot intervals along bundles. On completion of installation, neatly run and re-tie all cable bundles in the Closet and through cable plant.

T. All cable bundles within all Communications Rooms are to be no larger than 48 per.

11.3 Unused Components

A. Any components purchased in accordance with these specifications and unused shall be documented and passed to the Owner on completion of the project.

Part 12 - As-Built Documentation (required on completion of the work)

A. Following completion of the installation, submit the following record drawings, documentation and testing for approval.

B. As-Built Drawings

- As-built drawings showing locations of telephone, tele/data and data outlets, backbone, distribution, splices for backbone, link and external cable routes, data rack locations, telephone termination board locations and cable identifications.

C. Final Test Results

- Test results for each cable indicating tests performed, results obtained and values measured.

D. All documentation and drawings shall be provided in an electronic format (AutoCAD for drawings, MS Excel for schedule, etc) and supplied on CD-ROM. PDF or scans of non-electronically sourced materials are not acceptable. If there are questions regarding acceptable electronic formats, contact MAA/OT for clarification.