

Standard Operating Procedures (SOP) and Policy

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

S4 275116-TC CORE PA and Emergency Tenant Paging System

S4 275118-TC Emergency Tenant Paging

S5 MAA Radio System

S7 270000-TC Common Work

S7 270100-TC Copper Splicing and Termination for Closets

S7 270101-TC COMCAST Standard

S7 270526-TC Grounding and Bonding

S7 270528-TC Hangers and Support

S7 270553-TC Identification

S7 271116-TC Cabinets Racks Frames Enclosures for Data

S7 271119-TC Termination Blocks and Patch Panels

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-Backboard

S8 E911 PS ALI Standard

S9 Approved Products

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Related Standards

National Electric Code (NEC) most current edition

National Fire Protection Association (NFPA)

Installation of Communications Facilities Pathways

The Office of Technology does NOT specify pathway installation means and methods. All conduit used for Communications Facilities shall be considered as Electrical conduit for installation, code compliance and construction inspection

Intent of this section

The intent of this Section has multiple purposes, they are

1. To provide the DCI with applicable Standard Operating Procedures (SOP) and Policy of the MAA Office of Technology that have a direct impact on the performance and acceptance of work performed.
2. Reduce redundant information that applies across multiple sections of the OT and possible conflicting county or national standards
3. Provide a very detailed level of key items the DCI shall include in final product.

Warrantee

All work performed shall have a (2) year warrantee period for performance of products installed.

Existing Conditions

In the event, existing conditions do not meet the most current edition of the OT standard the existing conditions shall be brought up to this standard as part of the work being performed.

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All abandoned communications facilities shall be cleared per NEC and NFPA back to the source unless specifically approved by the OT and OFM

Approved Products

The Office of Technology has established this section of the standards based on performance of the products and best practices at the MAA. Only products in this section shall be used. OT use of product names and model or part number are used for the convenience of the DCI for reference and ease of evaluation, functional equivalents and approved equals will NOT be allowed without OT approval. If an inadvertent use of a product name is used elsewhere in the OT Standards, it is to be brought to the attention of the OT Engineer for evaluation and is to be considered an error in the standard.

Definitions:

The generic term Communications Room or Telecommunications Room are often used to describe any of the following:

Main Distribution Frame Room (MDF) is defined as the primary serving/distribution point for communications services to a major facility or grouping of facilities. **Example of such rooms would be NT109, NTE261C**

Intermediate Distribution Frame Room (IDF) is defined as a local distribution point for communication services to a locally confined area. **Example of such rooms would be C106H, E1107**

Computer Room (CR) is defines as an environmentally conditioned room with full power conditioning (UPS), FM200 etc and associated services **Example of such rooms would be C139J, NTE261C, C134A**

Extended tenant DEMARC defines communications facilities that are extended from a (MDF, IDF or CR) to a tenants or Airlines leased space for connection to the MAA network, MAA Emergency Paging, PSN, or other communications providers.

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Reserving MAA Communications Resources

During the design of new projects if MAA Communications Resources are required a Resources allocation request that must be submitted and approved by OT.

MAA Communications Resources is defined as any object or communications requirement that will be placed in or run thru a MAA Communications room. For example

- Request for fiber optics

- Placement of Equipment, to include foot print of cabinets, BTU output of equipment, power requirements

Communications Room naming convention

All facilities shall be documented and referenced by the door number. OT does not recognize room numbers in any of our record keeping.

Computer rooms (CR) facilities

OT engineer shall assist with design.

As a minimum requirement, full diverse and alternate fiber and copper interconnection is required to other computer rooms (NT109, C134A or NTE261C) OT will make the final termination pertaining to which locations get the pathways.

Systems Not Permitted Within a Communications Room:

These rooms are for the exclusive use of MAA/OT. No tenant or MAA contractor is to install equipment, frames or electronics in these rooms without written permission from an OT Engineer.

All cabling to these rooms should be kept to a minimum to conserve space.

All cabling shall be installed and dressed to present a profession installation.

All cabling shall be in cable tray. No unsupported cabling shall be permitted

Flexible Response System: Raceway, conductors and/or signaling devices.

Lightning Protection: Down conductors or grounding components.

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Equipment:	Any Tenant or MAA hardware, electronic equipment, wiring or racks that have not been approved by the OT Engineer
Electronic Noise Emitters	Any equipment that emits EMI/EMF Certification by the manufacturer shall be required.
Water, waste or drain lines	The installation in, thru or above the room

Restrict routing of conduit, pipes, ducts etc thru communications Room(s). The routing (if approved by OT) shall not be over electronic equipment or racks.

Communications Rooms Planning Considerations:

The following factors shall be considered when designing an area to be occupied by a Communications room

- (1) The room shall have a minimum dimension of 8' x 10', and a floor to ceiling clearance of 10-feet. The final size of the room will depend on the quantity of racks/cabinets and other equipment associated with systems.
- (2) Future growth shall also be factored into the final size of the room without the need for moving existing equipment,
- (3) The door shall be a metal hollow door fire-rated and sized at 36" wide for an IDF and double 36" wide for an MDF,
- (5) A minimum of two walls shall be provided with 3/4" FRT (Fire Retardant Treated) grade plywood, painted with 2 coats of light colored fire retardant paint
- (6) No windows
- (7) The flooring shall have electrostatic-safe vinyl tile and with a minimum floor loading capacity of 150 lbs/sq-ft

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(8) Space IDF's so that the furthest workstation cabling does not exceed **90-meters** in total length. (allows for 10 meters of patch and station cords)

Mechanical Systems:

The following factors shall be considered when designing an area to be occupied by OT systems:

- (1) HVAC equipment
- (2) Humidity control,
- (3) Dust and contaminant control,
- (4) HVAC redundancy,
- (5) Type of fire protection (*See Fire Protection section of this document*)
- (6) AC Power redundancy

HVAC: The system shall be designed to function properly for 24X7 operations. The system shall be designed to operate under positive pressure with respect to its surroundings. The equipment shall be sized and dedicated for the room it serves and be located outside of the room. This will reduce the possibilities of condensate water entering the racks/equipment. However, any equipment located inside the room shall be provided with drip pans and condensate pumps to shield the equipment below from potential water damage. A fire damper shall also be provided to maintain the room's 2-hour fire rating.

The general design criteria for HVAC systems shall be: Temperature shall be maintained not to exceed 85-degrees F with a relative humidity from 30% to 55%. All temperature sensors and controls shall be located within the room the HVAC equipment serves and at no more than 5-feet above the finished floor. For the Primary Communications Rooms and MDF, in addition to the requirements above, a dual/redundant HVAC system shall be provided.

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NOTE: The above planning considerations are not to be considered the only design. The final design shall be based on actual requirements of the space. All design work shall be to a fully built out communications room. Example if 3 rack/cabinets are installed but the room can fit 5 racks/cabinets the HVAC shall be sized for 5 racks/cabinets.

Fire Protection:

Consult with MAA OT at concept design phase to determine required level of fire protection. Pre-Action system shall not be installed serving the room. The location of the Pre-Action Fire Alarm Control Panel shall be located in a nearby room, but not within the same room it serves.

Wet or misting systems shall not be used unless approved by OT and the Fire Marshal and then only 2 stage systems shall be allowed.

Depending on what equipment is to be located inside the Communications Room; a Clean Agent type fire suppression system may be required in lieu of a Pre-Action system. A Clean Agent system will also require a separate room to house the system. The Communications Room served by the Clean Agent system will also be required to be fire-stopped and sealed per the system requirement. The DCI shall coordinate with MAA OT on the need for a Clean Agent system.

All communications rooms that have existing Clean Agent Fire Extinguishing Systems or Communications rooms that will have Clean Agent Fire Extinguishing Systems shall fully comply with **NFPA (most current edition)**. This includes any new work in the rooms. Example running a new conduit, pipe etc thru the space. Smoke/pressure leakage testing in accordance with NFPA Standard for Clean Agent Fire Extinguishing Systems shall be required to check all work and that room sealing integrity has been maintained.

NFPA 2001 Standard on Clean Agent Fire Extinguishing Systems

NOTE: All clean agent systems SHALL be designed and sized ceiling to floor, EXCLUDING drop ceilings if present. All clean agent rooms shall be designed for code compliance of the clean agent from floor (including space under any raised flooring) up to and including the bottom of the deck above. The design shall assume no special ceiling tile or tile clips, specialized lighting fixtures etc to meet FM200 requirements

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7.4 Enclosure Inspection.

Other than as identified in 7.4.1, the enclosure protected by the clean agent shall be thoroughly inspected at least every 12 months to determine if penetrations have occurred that could lead to agent leakage or other changes have occurred that could change volume of hazard, or both. Where the inspection indicates conditions that could result in the inability to maintain the clean agent concentration, the conditions shall be corrected. If uncertainty still exists, the enclosures shall be retested for integrity in accordance with 7.7.2.3.

7.4.1 An enclosure inspection shall not be required every 12 months if a documented administrative control program exists that addresses barrier integrity.

7.7.2.3* Review Enclosure Integrity. All total flooding systems shall have the enclosure examined and tested to locate and then effectively seal any significant air leaks that could result in a failure of the enclosure to hold the specified agent concentration level for the specified holding period. The currently preferred method is using a blower door fan unit and smoke pencil. Quantitative results shall be obtained and recorded to indicate that the specified agent concentration for the specified duration of protection is in compliance with Section 5.6, using an approved blower fan unit or other means as approved by the authority having jurisdiction. (For guidance, see Annex C.)

ELECTRICAL SYSTEM:

Power receptacles are to be labeled with circuit number, panel numbers and receptacle type with in a permanent manner per MAA design standards

All power and communications to racks and cabinets shall be top fed when raised flooring is not present.

Where raised flooring is present all communications cables shall be top fed and all power shall be bottom fed.

Power and communications cables shall maintain a 3 foot separation at all times.

Power Strips with circuit protection: Each rack/cabinet containing powered equipment shall have two independent Power Distribution Units (PDU) vertically installed, one on each side. See approved product section.

One PDU shall be dedicated to commercial power, the other to conditioned commercial power.

The PDU shall have sufficient outlets to provide service to the entire fully populated rack.

The UPS PDU shall be on the left side (facing from rear) shall be delineated as UPS either with orange receptacles or permanently marked "UPS POWER", conditioned commercial power shall be on the right.

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Blade Power Receptacle: Computer rooms shall be equipped with a 30A/208V normal power twist lock receptacle(s) capable of supporting an emergency cooling unit. **Confirm requirement with OT Engineer**

The minimum power requirements for each equipment PDU are 30A/120V.

Reference approved products section.

DCI will coordinate with OT and the electrician for final connections

Coordinate with MAA OT on the need for twist-lock receptacles at the rack, utilizing 30A, 120V circuits.

Normal Power: Commercial power (dedicated 20A/120V circuit) shall be provided to duplex convenience receptacles serving the Communications Room per NEC. The receptacles shall be accessible at all times and not be blocked by racks, cabinets or other equipment.

System Power Requirements: All systems requiring A/C power in shall be provided with an uninterruptible power system (UPS). The UPS shall be sized to accommodate calculated load plus 200% with run time of 15 minutes. Minimum size of floor mount UPS units shall be 20 kVA, minimum size of rack mount units shall be 1400 VA. Floor units shall be equipped with a Battery Cabinet and Emergency Bypass Cabinet. Output panel board for UPS power distribution should be in the communication room. The UPS shall be provided with (1) network interface cards for Simple Network Management Protocol (SNMP) connection for OT monitoring. The UPS shall also be provided with (1) network interface card and components for the Building Automation System (BAS) connection, compatible with the Johnson Controls' Metasys System.

Edge Device (MAA End User Edge Equipment)

A/C UPS Power Receptacles: All IT equipment shall be protected by a UPS with the ability to provide 20A/120VAC power filtering and power backup for a period of not less than 15 minutes under full load. The load shall be calculated under the assumption that a minimum of (1) CPU and (1) monitor will be connected to a single AC outlet. The purpose of the UPS is not to

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provide power during power outages. The primary function is to provide power filtering and to provide 15 minutes of backup power so the system can be shut down in a regulated fashion.

A duplex 20A/120V UPS receptacle shall be installed adjacent to workstation communication faceplates to support MAA IT PC's and associated hardware is required. The receptacle shall be orange in color and shall be associated with UPS support.

Modular furniture power outlets maybe exempt from the orange outlet requirement. Industry approved marking may be used. Example and orange triangle on outlet.

NOTE: There shall be (1) duplex 20A/120V UPS receptacle next to every installed communications outlet (copper)

All MAA networked printers shall have a 20/120 VAC outlet protected by individual surge suppression device installed instead of a "standard outlet".

Electrical Panel boards: Electrical panel boards shall not be located within Communications Rooms except when required by code. Where necessary, panel boards shall be dedicated to loads within the Communications Room only and shall be located to minimize electromagnetic interference. All panel boards if required will be "Clustered" within the room to reduce overall clearance requirements and for employee safety near the entrance door.

Transformers: Transformers shall not be located within Communications Rooms. Where necessary, transformers shall be dedicated to loads within the Communications Room only and shall be located to minimize electromagnetic interference. Transformer shall have a Faraday Shield installed to further improve noise immunity and be K-rated to accommodate non-linear loads. As an alternative, the transformer can use harmonic canceling techniques to mitigate the effects of harmonics.

Lighting: Lighting shall be limited to the use of 4-foot industrial style with 20% up light fluorescent, two lamp fixtures minimum (with wire guards) controlled via a light switch at each exit. The design luminance shall be 50-foot-candle measured at 3-foot above the finished floor, while taking into account equipment in the room. Suspend all light fixtures from a UL

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listed strut-type channel raceway. Provide one light fixture inside the Communications Room to function during a power outage (connection to generator or UPS). Lighting shall follow MAA electrical standards. Lighting shall be designed and installed to provide maximum coverage in front and behind equipment. No motion sensor type switch shall be allowed, only manual toggle light switches shall be allowed.

Access Control System: All Communications Rooms shall have a Controlled Access Security System entry system installed in accordance with current MAA Standards

Voice: A wall mounted phone and all associated wiring shall be installed 48-inches above the finished floor located near the entrance/exit.

Raceways and Supports: A cable tray system shall be installed around the entire perimeter of the room and routed above each equipment rack/cabinet. The mounting height shall be a minimum of 12-inches above the racks and shall be supported directly to the structural steel.

Contact OT engineer for specifications. Reference approved products section. Cable tray specification varies depending on room usage.

Fire Alarm System Interface: A Fire Marshal approved monitoring module and smoke detector shall be installed at the location of the Pre-Action (or Clean Agent) Fire Alarm Control Panel that protects the Communications Room(s). The monitoring module serves as the interface between the fire protection system protecting the room and the BWI's Fire Alarm System. In general, the fire protection system will have pull stations and audio/visual devices within the Communications Room.

High Density Protection Field:

Shall be required on all OSP facilities entering the room when exiting the splice case, the copper cabling shall be routed to a high-density protector frame using stub cables. The protector frame shall be located as close to the entry point as feasible and adjacent to the splice case. Distribution stub cables shall be extended from the protector frame to the main distribution frame.

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MAA Permits

Related Reference:

<http://www.marylandaviation.com/content/permitsandforms/constructionzoning/constructionpermits.html>

If the work performed requires a MAA building or installation permit the work performed must comply with the permit. The permit process is considered part of the work to be performed.

Request for Variance:

If the DCI wishes to request an exception to the OT Standard as applied to a specific project, he/she should submit a Request for Variance form for approval. Every effort should be made to meet the OT Standards outlined and requests for variances will only be considered for instances where sufficient technical, budgetary and code merit exists. It is recommended that the DCI contact the Office of Technology (OT) to informally discuss the circumstances of a possible request for variance prior to submission. The request for Variance should identify if a “variance” to the Standard is requested.

Changes to this Standard:

Permanent changes to this Standard can be requested by submitting a Change Request.

Sufficient technical and/or budgetary and/or code merit must be proven.

Minor grammatical or typographical errors can be corrected by contacting the OT Engineer.

Installation of Circuits including Dial tone services

Copper Plant

MAA/OT cannot guarantee clean data circuits on the MAA copper plant. It is highly recommended that any data circuits be extended past the DMARC (NT109) to final location of data equipment by the service provider. Contact OT help desk at (410) 859-7599 (72) hours prior to installation of the circuit for assignment of cable pairs.

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MAA/OT shall not warrant the performance of any commercial service it may be requested to move. Copper plant will be tested for “Continuity” and distance only. If further testing is requested OT at its discretion shall charge established rates for additional testing.

Fiber Plant

MAA/OT can only guarantee performance of the fiber optic plant to OT testing standards. OT cannot guarantee performance of edge devices. It is highly recommended that users of the fiber optic plant perform testing of the facilities prior to use.

Leased Fiber Optics will be tested for “Continuity” and distance only. If further testing is requested OT at its discretion shall charge established rates for additional testing.

Radio Frequency Usage

All licensed or unlicensed use of radio frequency equipment or services shall be coordinated and approved by the MAA Radio System Manager or designee. Reference S10 MAA Radio System

Communications and Information Technology Codes and Standards

OT Engineer shall make final determination pertaining to which standard takes precedence in the event of conflict.

The OT standards and specifications shall be used for all communications Designs, installations and testing.

These standards shall apply to any concessionaire tenant or Airline communications facilities installed at MAA owned properties unless a variance approved by OT Engineer.

Temporary or emergency installations may be exempt from these standards with written permission of the OT Engineer.

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Any design work or work performed as part of a contract that does not use these OT standards along with other information provided by the Office of Technology shall be considered non-compliant and will be rejected.

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

OT engineer shall approve all related cut sheets, change orders, Extra Work Orders in conjunction with the designer of record if applicable. The OT Engineer shall make all final determinations.

All Life Safety and Public Safety infrastructure (Copper and Fiber) shall be installed in conduit unless approved by OT Engineer.

Termination point(s) will be specified by the OT Engineer.

ONLY THE OFFICE OF TECHNOLOGY shall terminate connections or circuits to live communications system(s)

OT staff does not provide escorts for tenant services. All tenant vendors shall be badged or escorted by tenant.

Security access to communications rooms shall only be granted by OT Authorized signers as defined by the Office of Airport Security (OAS).

Service loops

A service loop will be required on all cable facilities for future Move Adds Changes (MAC) work at all access points of the communications infrastructure as determined by OT Engineer.

Contact the OT Engineer for specifications.

All cables install into or thru a manhole shall have a minimum service loop of sufficient length to allow cable to be removed from the manhole 6 feet (12 feet total length) or one complete loop around the inside of the structure, whichever length is greater to allow the cable to be pulled up for rep

Service loops shall be installed not to exceed manufactures bend radius specifications

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~~All ISP station cable shall have a minimum 12 foot service loop when exiting raceway to service outlets to allow for future MAC work.~~

~~**Note: Conduit is not required from the cable tray to service outlet in very specific situations. Contact the OT Engineer for guidance**~~

Support System Expansion

~~All communication support systems shall be designed for a minimum of 50% expansion unless approved by OT Engineer.~~

Wall Penetrations: Wall penetrations shall be the preferred method of presenting communications outlets; floor penetrations shall be avoided. All wall penetrations to a work station shall be recessed in the wall and terminate in a device box and have a device wall plate. Conduit stub out is not required and preferred NOT to be used to accommodate future MAC work.

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Testing and Acceptance

The Designer or Contractor or Installer (DCI) shall provide a comprehensive testing plan document that includes all tests to be performed. The document shall include manufacturer oversight and/or certification regarding use and setup of test instruments. The contractor shall submit the test results (electronic copy) for review and approval to the OT Engineer.

The OT Engineer reserves the right to witness the testing for verification of testing methods. If the OT Engineer does not witness the testing, The OT Engineer reserves the right to have a 10% retest done at no cost to the MAA.

The 10% retest shall consist of the OT Engineer selecting 10% of the facilities previously tested for a retest. If any of the 10% retests fails, then the entire facility will be considered failed and shall be retested and witnessed by the OT Engineer.

Inside Plant (ISP)

Splice Case

ISP Splice cases shall be installed not to exceed 48 inches above finished grade

When making the transition from OSP to ISP for code reasons the AWG of the copper shall be the same as the OSP cabling. For this definition the cable shall be considered OSP until it is terminated on specified lightning protection field.

Outside Plant (OSP)

High Density Protection Field:

All terminuses of OSP shall be provided with OT approved protection fields at both ends of the cable and shall be required on all OSP facilities entering the room when exiting the splice case, the copper cabling shall be routed to a high-density protector frame using stub cables. The protector frame shall be located as close to the entry point as feasible and adjacent to the splice case. Distribution stub cables shall be extended from the protector frame to the main distribution frame.

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Cable Shield: End-to-end continuity isolated from ground; no connection to ground shall be present.

A detailed schematic shall be provided for all outside plant cables. The schematic shall show cable type, size and count, splice/termination points, lengths and other details/call outs, as may be required. Include references to manholes, buildings, rooms etc. Provide digital photographs showing the cable routing, from window to window, within the manhole.

Locator cable requirement is in addition to industry best practice of installing a warning tape for fiber optics applications

The locator cable must be identified on drawings and consistent with cable installation. For example, if cable is in inter-duct the locator cable shall be also installed in the same inter-duct. Detail will also include sufficient information to determine excess capacity for future use.

Locator cable shall be continuous, and where applicable bonded to existing locator cable.

All splice closures shall be pressure tested per manufactures recommendations.

In lieu of manufacture specifications closures shall remain under 10 pounds of pressure for 48 hours.

Splicing enclosures shall be re-enterable and filled with re-enterable flooding compound.

All OSP conduits shall be buried to a minimum depth of 48 inches unless approved by OT Engineer.

NOTE: SHA requires 60 inches for some applications where roadway may be widened

Manhole/Conduit:

Manhole and hand holes

Drawings of manholes shall be “butter flied” to provide detail of windows and conduit termination points. Racking detail and including intra manhole cable routing and splice closures locations shall be included. Include details of building entrances.

A detailed schematic shall be provided for all outside plant cables both copper and fiber. The schematic shall show cable type, size and count, splice/termination points, lengths and other details/call offs, as may be required. Civil drawings shall detail routing and structure (tied to GPS points) and other significant elements such as other utilities, structures etc. Include references to manholes, buildings, rooms etc. Provide digital photographs showing the cable

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routing, from window to window, within the manhole, the manhole interior, of exterior topographical surrounding of manhole. Photographs should be able to aid in locating manholes in the field. Locater cable must be identified on drawings. Detail will also include sufficient information to determine excess capacity for future use. General notes shall reflect the conduit marking in accordance with MAA/OAT facilities marking standard

Planning Considerations:

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The Standardization of Communication Cabling shall be as follows:

All backbone or feeder fiber and Data cabling shall be installed in conduit with approved inter duct.

Communications rooms (IDF) facilities

Single Mode Fiber Optic Minimum fiber count 24 strands, Terminated with SC connector

Multi Mode Fiber Optic Minimum fiber count 12 strands, Terminated with ST connector

Communications rooms (MDF) (Back Bone Facilities)

Fiber

Single Mode Fiber Optic Minimum fiber count is 144 strands

Multimode Fiber Optic Minimum fiber count 72 strands

Copper feeder cable Minimum copper count 1200 pair, CAT 3

Note: when redundant and diverse feeds are used ½ the fill count to EACH redundant communications room meets the fill counts above.

Planning Considerations when designing pathway systems:

The following factors shall be considered when designing an underground pathway system:

(1) The overall length of the raceway from source to destination, (2) the length of raceway between pulling points, (3) the quantity of bends and offsets between pulling points, (4) the maximum pulling tension recommended by the cable manufacturer, (5) the minimum bend radius recommended by the cable manufacturer, (6) the minimum depth raceway shall be installed under runways, taxiways, apron areas, roadways, walkways, etc., (7) location and quantity of manholes, (8) size, weight and quantity of cable reels, (9) impact on airport operations during installation and future maintenance.

Cable pulling calculations shall be performed and submitted during design to show that cable pulling tensions and sidewall pressure recommendations are not exceeded and that the jamming ratio meets criteria for a jam free pull. Detail will also include sufficient information to determine excess capacity for future use.

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Intra-Building Cable Tray/Conduit:

~~CAD drawings of the inside plant facilities shall include a layer detailing the routing, size, penetration points etc of all intra_building cable tray and conduit. The layer shall include conduit size, penetration/pass through points, elevation points, pull boxes, sleeves etc. Where tray/conduit are installed in areas that are not easily assessable such as above hard ceiling, through tunnels or sterile areas, adequate detail shall be provided to allow for the accurate location for future use. Detail will also include sufficient information to determine excess capacity for future use. General notes shall reflect the conduit marking in accordance with MAA/OAT facilities marking standard~~

Intra-Building Cable:

~~A detailed schematic shall be provided for all intra_building cables both copper and fiber. The schematic shall show cable type, size and count, splice/termination points, lengths and other details/call offs as may be required. Conduit size must be included. Detail will also include sufficient information to determine excess capacity for future use. Include references to manholes, buildings, rooms etc. General notes shall reflect the conduit marking in accordance with MAA/OAT facilities marking standard~~

Planning Considerations:

~~The following factors shall be considered when Designing an underground pathway system:~~

~~(1) The overall length of the raceway from source to destination, (2) the length of raceway between pulling points, (3) the quantity of bends and offsets between pulling points, (4) the maximum pulling tension recommended by the cable manufacturer, (5) the minimum bend radius recommended by the cable manufacturer, (6) the minimum depth raceway shall be installed under runways, taxiways, apron areas, roadways, walkways, etc., (7) location and quantity of manholes, (8) size, weight and quantity of cable reels, (9) impact on airport operations during installation and future maintenance.~~

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~~Cable pulling calculations shall be performed and submitted during design to show that cable pulling tensions and sidewall pressure recommendations are not exceeded and that the jamming ratio meets criteria for a jam free pull. Detail will also include sufficient information to determine excess capacity for future use.~~

Conduit and inter-ducts:

All ISP inter duct shall be plenum rated

~~When installing new conduit exceeding (2) two inch (duct bank or single duct) the contractor shall install inter-duct in the conduit. The purpose of the inter-duct is to allow future use of the duct system.~~

~~Minimum number and size of inter duct to conduit size shall be~~

~~2-inch conduit, install (1) 1 1/24-inch smooth wall/corrugated inter duct~~

~~4-inch Conduit, install (3) 1 1/24-inch smooth wall/corrugated inter duct~~

~~For all OSP installs smooth wall inter duct will be accepted~~

~~All conduits including inter-duct shall have a MULE tape installed in all empty ducts. The MULE tape can determine length of the conduit run in the future.~~

No “weave or cloth type” inter duct shall be allowed without a variance from OT

Other design considerations and requirements:

~~Include racking and splicing detail for full duct entry capacity.~~

~~Include ring and cover marking detail and permanent manhole ID within manhole.~~

~~Include grounding and bonding detail.~~

~~All conduits installed shall be proofed by pulling a flexible mandrel or cable section having a diameter no less than 90% of the diameter of the conduit between manholes and manholes and building entrances. Pulling tensions shall be monitored with a dynamiter and maximum tension recorded.~~

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Grounding points shall be measured for resistance to ground; readings shall not exceed established standards.

Detail will also include sufficient information to determine excess capacity for future use.

Reserving MAA Communications Resources

During the DCI of ~~new~~ projects if MAA Communications Resources are required a request for resource allocation permit must be submitted and approved by OT prior to start of work.

Without the approved permit OT, does not guarantee resource available and will give preference to permit holders in the event of conflict.

MAA Communications Resources is defined as any object or communications requirement that will be placed in or run thru a MAA Communications room. For example

1. Fiber optics
2. Copper cable
3. Placement of Equipment, to include foot print of cabinets and wall space
4. Power, both commercial outlets and conditioned (UPS)
5. Environmental (HVAC)

The DCI shall be required to provide (if applicable) net change of environmental information.

For example

Existing UPS in room is 40KVA operating at 62%

New equipment will add 30-amp load and the UPS will operate at 76%

New equipment will add 6,000 BTU of heat

New equipment will consume 25 SqFt of floor space as shown on drawing provided

New equipment will require two strands of Single Mode fiber from the new equipment and patched to MAA fiber back bone.

(Note the fiber back bone request shall be a separate permit and if mission critical shall be done and results in hand before reserving room)

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MAA Communications Resources is defined as any object or communications requirement that will be placed in or run thru a MAA Communications room. For example

— Fiber optics

— Copper

— Placement of Equipment, to include foot print of cabinets and wall space

— Power, both commercial outlets and conditioned (UPS)

— Environmental (HVAC)

Upon approval of permit and acknowledgement back to OT, the requestor/requesting authority shall delineate with a 2D outline (IE Cardboard, to scale) the exact area to be reserved within 30 days of approved permit. The area shall also have the permit number, requestor's name, and project name facilities requested (IE type of fiber and count). Failure to delineate area will void the permit and space may be reassigned.

General Design

Splice plan and breakout plan

All cable plans shall include a splice plan and breakout plan for all connections and terminations.

Drawings

The drawings shall show all systems within the Communications Room, coordinated with each other and shown on a composite drawing (Coordinated Drawing). The composite drawing will have related elevations, sections and plan views to validate coordination. In addition, the composite drawing shall show all floor and wall penetrations.

Composite drawing shall also show at a minimum 2 adjacent rooms in all directions include floor above and floor below and shall show its location on a terminal plan

Standard Operating Procedures (SOP) and Policy

Qualifications of Designers, Contractors and Installers (DCI)

Company Experience: The DCI for a project's communications system shall submit documentation demonstrating that the company has successfully ~~designed,designed~~ built, and customer has accepted to a minimum of (3) projects of similar size, complexity and scope within the last 3-years.

Staff Experience: Information shall be provided regarding the certification, training and experience of all key members of the project team. The project team shall include at a minimum one Registered Communication Distribution Designer (RCDD) certified by BICSI. The project team shall be identified and resumes provided for the project team to the OT. The resumes shall include copies of all certifications and licenses required.

Installers of all communications facilities shall be supervised at a minimum by a BICSI certified IT Technician, in the discipline of the work to be performed

Project Planning Considerations

All Information Technology (IT) related projects including related support infrastructure shall be coordinated with MAA OT. The DCI shall contact a MAA OT Engineer to arrange a meeting prior to the initial submittal of the project (30%). The project coordination shall include all MAA projects as well as all Tenant related projects. The DCI shall also coordinate this with MAA OT Engineer.

All Information Technology (IT) related projects including related support infrastructure shall be coordinated with MAA OT. The Architect/Engineer shall contact a MAA OT Engineer to arrange a meeting prior to the initial submittal of the project. The project coordination shall include all MAA projects as well as all Tenant related projects. Depending on the magnitude of the project, "Break-Out Session" meetings may also be necessary. The Architect/Engineer shall also coordinate this with MAA OT Engineer.

Standard Operating Procedures (SOP) and Policy

Communications Subject Matter Expert (CSME)

When large Projects impact tenants and/or Airlines communications facilities and will be significantly impacted (as determined by the OT Engineer). The prime contractor shall employ at their cost a CSME to coordinate all communications activities between the tenants, Office of Technology and communications vendors. This Communications SME shall also work under the direction of OT for compliance with standards and coordination of all MAC work. Reference section S7 271333

As Built Drawings

They shall be compatible with the record system being maintained by MAA/OT at the time of installation.

Detail will also include sufficient information to determine excess capacity for future use.

Use of MAA owned Copper and Fiber Resources

Note: The resources discussed here do not include facilities installed at tenant's expense from the MAA communications room to the tenant communications room.

Upon receipt of the permit request OT will establish the path, test for continuity, and test for length where applicable. This information will be given to the requesting authority.

Tenant Fiber Optic

All installed tenant fiber shall be installed as to "Touch" MAA communications rooms so that the MAA can reuse the facilities for the next tenant to reduce abandoned cables and strand count shall not be less than 12 strands of Fiber Optic cable.

MAA Leased Facilities (Fiber).

Standard Operating Procedures (SOP) and Policy

Leasing of MAA Facilities shall be coordinated with MAA Office of Commercial Management. Rate fees can be found at

<http://www.marylandaviation.com/media/client/passur/bwitenantdirectives/TD-BWI-401.1.pdf>

As part of the lease fees for the use of these facilities the MAA/OT has a responsibility to maintain the facilities in good working order. If a MAA leased communications facility fails the MAA/OT will repair it at no charge to the customer. The MAA/OT is not responsible for the edge devices; including communications facilities attached to the MAA leased communications facility.

Unauthorized Users of the system

Unauthorized use is defined as any connections found that have not been approved by or installed by OT without full documentation.

Unauthorized entry or connections into these facilities is prohibited.

Upon discovery of unauthorized use of the facilities

1. OT will make every effort to identify the user
2. If user can be identified and the use of the facilities is determined to be within OT guidelines the customer will be invoiced back to last physical inventory date including installation charges plus actual time (troubleshooting charge) spent identifying user of the system.
3. **If the user can not be identified the services will be disconnected.**
4. The MAA/OT will suspend access to all MAA Communications rooms for 30 days first offense, 60 days second offense, permanently 3rd offense to tenant and/or contractor performing work.

Standard Operating Procedures (SOP) and Policy

MAA/OT reserves the right to charge for repair or troubleshooting services rendered to non-MAA communications facilities or in the event the trouble reported is determined not to be a MAA responsibility. The actual rates and charges can be obtained in the MAA 401 rate and charges directive. These rates can be adjusted to reflect changing conditions. The Manager, Division of Telecommunications will determine the means and methods of repair, this includes if MAA forces or contract support will perform the work. Users are not required to use the MAA services for repair. They can use their own badged maintenance personnel or contractor

Example. If Tenant system is not communicating properly and they believe it is an MAA Communications issue. The tenant will ask for repair dispatch. The MAA will trouble shoot the problem. If the problem is MAA communications facility the MAA will repair at no charge. If the problem is determined to be a non-MAA facility the tenant will be invoiced for service call.

Procedures for requesting repair of leased MAA Communications facilities:

1. Call the MAA Help Desk (410-859-7599).
2. If emergency dispatch is required after normal working hours (follow voice prompts) to the Telecommunications group.
3. E-mail the MAA help desk if next business day service is what is required.
4. Give call back information and description of the problem.
5. The responding MAA technician will work with caller to determine priority and discuss potential costs. (note: caller shall have authority to authorize potential Time and Material costs)
6. Service will be performed as agreed to between MAA and customer
7. There shall be a minimum 4-hour charge on all after hours call outs