**SPECIFICATION NOTES:**

**[XXX] = OPTIONS FOR SELECTION. DELETE ALL OTHERS NOT APPLICABLE**

**[XXX] =SPECIFICATION EDITOR NOTES. Remove WHEN COMPLETE**

**(XXX) =gENERAL INFORMATIONAL COMMENT. Remove WHEN COMPLETE**

**SECTION 27 11 00**

**COMMUNICATIONS EQUIPMENT ROOM FITTINGS**

1. **GENERAL**
   * + 1. SCOPE
          1. This section details product and execution requirements for Air Containment Systems used within Information Technology (IT) Equipment rooms and spaces.
          2. Provide all labor, materials, tools and equipment required for the complete installation within this section, construction documents, and scope of work.
          3. Communication Equipment Room Fittings of Cabinets are covered under this document.
       2. DESCRIPTION
          1. Communications Equipment Room Fittings include:

Air Containment **[CONSULTANT TO MODIFY AS APPROPRIATE FOR JOB SPECIFIC REQUIREMENTS]**

* + - * 1. Refer to Project Drawings for Equipment Room layout and equipment placement.
      1. RELATED WORK

**[MODIFY AND ADD OTHER APPLICABLE SECTION TO THIS SPACE AS APPLICABLE THAT RELATE TO THIS SECTION]**

* + - * 1. Refer to Section 27 00 00 - General Communications Requirements which identifies related specification sections in this and other Divisions (if applicable).
        2. Drawings and general provisions of the Contract, including related specifications applicable to this Section.
      1. TELECOMMUNICATIONS REFERENCES AND STANDARDS
         1. Work under this Section is subject to requirements of Contract Documents including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.
         2. The following industry standards are the basis for the cabinet system described in this document.

TIA/EIA-569-A – Commercial Building Standard for Telecom Pathways and Spaces

TIA/EIA-942-A – Telecommunications Infrastructure Standard for Data Centers, 2014

TIA/EIA-606-B – Administration Standard for the Telecommunications Infrastructure of Commercial Buildings 2012

TIA/EIA-607 - C- Commercial Building Grounding/Bonding Requirements, 2015

ANSI-J-STD – 607-A Joint Standard for Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications, 2002

ANSI/TIA – 568-C Commercial Building Telecommunications Cabling Standard, 2009

ANSI/NECA/BICSI 568-2006 – Standard for Installing Commercial Building Telecommunications Cabling

NFPA-70- National Electric Code (NEC) – **[2008], [2014]**

* + - * 1. Related Division 27 Sections include:

Refer to individual technical sections identified above (if applicable).

Most recent industry related of all documents apply to this project. In the event of conflict between applicable documents, the order above shall dictate the order of precedence or supersede in resolving the issue unless an enforceable local or national code is in effect.

01 6000 Product Requirements

* + - * 1. Related sections in other Divisions of Work:

See individual technical sections identified above (if applicable).

* + - 1. DEFINITIONS
         1. Refer to Section **[27 0000]** - General Communications Requirements and Section **[27 1000]** - Structured Cabling which provide information on Definitions used in this and related sections.
      2. ABBREVIATIONS AND ACRONYMS
         1. Refer to Section **[27 0000]** - General Communications Requirements and Section **[27 1000]** - Structured Cabling which provide information on Abbreviations and Acronyms used in this and related sections.
      3. WORK BY OWNER

**[MODIFY AND ADD OTHER APPLICABLE SECTIONS TO THIS SECTION AS APPLICABLE THAT RELATE TO THIS SECTION THAT DEFINES WORK BY THE OWNER]**

* + - * 1. Refer to Section **[27 0000]** - General Communications Requirements that identifies Work by Owner affecting sub-system(s) covered by this section.
      1. BIDDING REQUIREMENTS
         1. Manufacturer shall include a full containment submittal for review with bid for owner review.
         2. Contractor to provide as part of bid, initialed bid documents by the manufacturer to confirm they have received and will comply with all applicable specification and drawings associated with this portion of work.
      2. SUBMITTALS
         1. Provide samples of finishes and panel material for review by owner/engineer upon request.
         2. Provide manufacturer’s product data including material descriptions, construction details, finishes, weight, attachment requirements, and included accessories.
         3. Provide manufacturer’s detailed shop drawings including cabinet, components factory and field mounted, location and size of field connections and components.

Include individual dimensional information of Containment System and applicable attributes and its included components in elevation, plan, and isometric viewing perspectives.

Include required working clearances, cable entry egress and ingress pathways **[If Applicable**] and required clearance for doors and panels.

Provide detailed attachment details for required attachment to support structure

Provide Manufacturer’s Installation and Operation Manual.

* + - 1. QUALITY ASSURANCE
         1. Refer to Section 27 00 00 - General Communications which identify general quality assurance requirements for the Project.
      2. GUARANTEE
         1. Refer to **[Division 01]**, **[General Conditions]**, and **[General Requirements]** - Guarantee Documents for general warranty requirements.
         2. Refer to specific sections contained herein for additional warranty requirements.

1. PRODUCTS
   * + 1. COORDINATION
          1. Containment systems shall be manufactured to accommodate new or existing IT Equipment Cabinets or Racks.
       2. AIR CONTAINMENT ENCLOSURE
          1. Approved Manufacturers: IMS AMCO

**[MODIFY SECTIONS ACCORDINGLY TO REFLECT THE CORRECT HOT AISLE/ COLD AISLE CONFIGURATION WITH PANELS]**

* + - * 1. General:

Provide required components to enclose the **[hot/cold]** aisle from the **[cold/hot]** aisle. The **[hot/cold]** aisle containment enclosure system shall include a frame with supported enclosure system to contain **[hot/cold]** IT equipment **[exhaust/supply]** air in the **[hot/cold].** The enclosure partition wall shall be in the plane with the **[rear/front]** face of the IT cabinets, extending above the cabinets to completely seal the **[hot/cold]** aisle. Vertical Panels installed in the plane with **[rear/front]** of cabinet shall be **[hinged, double hung, or solid (no removeable)]**.

Containment system may use the **[structural ceiling system, floor, cabinet]** for mounting of the enclosure walls.

Flexible bulb gasketing material shall be provided to ensure a tight seal between the ceiling structure and the containment system. **[Bulb gasketing or brush]** to be provided between the containment and the cabinet.

**[Provide full height filler panels for any cabinets not installed or omitted. The containment system shall accommodate replacing filler panels with IT equipment cabinets without modification. Filler Panel frame and construction shall match the rigid containment wall panel construction and color.]**

Per UL723 and ASTM E84, the system shall not exceed the following surface burning characteristics:

Smoke development index acceptable range: 0 to 450

Flame spread index: less than 2.5 inches per minute

Shall meet all requirements for FM Global Data Sheet 5-32 Requirements.

All components of the system shall be suitable for installation within a data center operating space.

* + - * 1. Containment Panel Construction:

System shall consist of aluminum extruded frame surrounding **[3 mm polycarbonate], [4.5 mm polycarbonate panels], [3 mm clear PVC, 6 mm twin-wall polycarbonate].** Aluminum extrusions shall have a center channel for affixing mounting equipment and securing adjacent panels.

Hard wall panels shall be provided for the entire length of the row.

Height of panels shall be coordinated with the cabinet, floor, and ceiling installation. **Hard wall panels shall be easily removable through mechanical fasteners to allow access to the non-contained area**.

Frames to be **[anodized clear finish], [black anodized finish], [white powder coat finish]**.

Provide filler panels and seal all seams between panels, cabinets, and ceiling to create a sealed enclosure to block bypass air.

Panel materials shall be UL tested, meet ASTME84, and be acceptable with all local codes.

System shall not interfere with the cabinet door sealing or travel.

Paneling material shall have excellent UV stability and shall have at a minimum a verifiable 10 year track record with no UV degradation.

Panel penetrations for cables, electrical power distribution, or cable tray shall be sealed with **[Brush], [Cool Boot], [Rubber Grommet]**.

* + - * 1. Heat Activated Ceiling Panel

Provide Containment solution to accommodate various height cabinets, in-row cooling units, and/or in-row UPS systems.

Ceiling panels shall be fabricated of extruded aluminum frame surrounding 3.8mm clear polyvinyl chloride material.

Panels shall span across the aisle width and shall overlap the top of the cabinet by **[1”-6”]**.

Panel materials shall be UL-R4036 rated for use under 165°F systems and be acceptable with all local codes. Panels shall be activated at 135°F.

Panel material shall also meet or exceed ASTME84 Flame Spread

* + - * 1. Soft Wall Containment

Provide containment solution to accommodate various height cabinets.

Track material shall be 6560 T-6 Temper Aluminum with channel to mount curtains.

Fusible links shall **be [thermally activated[, [electronically activated]**

Thermally activated fusible links shall be activated at **[165°F], [135°F]**

Track shall be permanently attached fusible link material. **[Fusible links shall not be used for mounting curtains to track]**.

Curtain materials shall be UL tested, meet NFPA 76 data center standard, ASTM E-84 standards and are Class 1 fire rated.

Curtain material shall have excellent UV stability and shall have at a minimum a 10 year verifiable track record with no UV degradation.

* + - * 1. Aisle Doors:

Doors shall be made from 6560 T-6 temper aluminum frames and have full height **[3 mm polycarbonate], [4.5 mm polycarbonate panels], [3 mm clear PVC], [6 mm twin-wall polycarbonate]** viewing panels. Door assembly height shall match cabinet/aisle height.

Door shall provide minimum **[42]** inches clear opening.

Door shall be **[single sliding], [single swing], [double sliding], [double swing]** open/ close.

Door to have **[manual], [auto-closing]** mechanism. Doors shall seal tight together when closed.

Doors to include all hardware for mounting to cabinets and floor system.

Brush/rubber material shall be used to minimize air leakage while door is in a closed position. Brush/ rubber shall seal against frame.

Door frame shall seal tightly to the cabinets and shall have gasketing material to prevent air leakage between the cabinets and frame.

* + - * 1. Warranty

10 years from date of owner acceptance

1. EXECUTION
   * + 1. GENERAL
          1. Refer to project Drawings for communications equipment room layout and equipment placement.
          2. New communications equipment rooms must be free from dust, dirt, and other foreign materials before installation of any termination hardware or termination of copper or fiber optic cables.

Door to room must be closed during termination if area outside room is not dust-free.

* + - 1. AIR CONTAINMENT ENCLOSURE
         1. Provide all components of the aisle containment enclosure **([supported panels] [soft containment]**, aisle containment doors, sealing kits) from a single manufacturer.
         2. **[As Applicable]** Installation shall be coordinated by installers for interface with Fire Alarm System and/or VESDA for monitoring or initiation of panel opening upon event.
         3. Installation shall be coordinated by installers for alignment with Fire Sprinkler System (wet and dry) heads.
         4. Installation shall be coordinated by installers for alignment with Fire Sprinkler System (wet and dry) heads.
         5. Installation shall be coordinated by contractor to align containment systems and components with supply and return air grilles.
         6. Installing contractor to coordinate with ceiling and flooring installation teams to align with floor and or ceiling grid for airflow and other systems (lights, sprinkler heads, fire/ smoke detectors, overhead cable tray, overhead power systems, etc.).
         7. Install the enclosure system using the manufacturer’s installation instructions. System frame must be secured to **the [structural ceiling] [floor] [cabinets]**. The enclosure must be field fitted to match height requirements and secured to the **[structural ceiling] [floor] [cabinets]**.
         8. Install aisle containment door using the manufacturer’s installation instructions. Door shall be secured to the frame that supports the overhead panels**. [Doors and or the door frame shall be secured to the IT Cabinets. Securing the door/door frame to the IT cabinets shall be coordinated with Owner prior to starting installation**. Installers shall use floor installation hardware as provided by the manufacturer. Should additional hardware be required beyond what the manufacturer provided, Installer shall provide.
         9. Containment Manufacturer to provide **[one]** individuals and include all expenses for up to **[5]** working days to be onsite to supervise and provide direction to installing contractor. Manufacturer representatives as part of the **[5]** days of onsite time, shall be onsite during the installation kick-off and lead a training session for the installing contractor to review the installation methods and procedures. Installing contractor shall coordinate with manufacturer to coordinate onsite time based upon construction schedule.
      2. FIELD TESTING
         1. General

Refer to Section 27 00 00 - General Communications Requirements and 27 10 00 – Structured Cabling for guidelines regarding documentation requirements.

Refer to referenced technical sections for detailed requirements to testing of each cable sub-system.

* + - 1. DOCUMENTATION
         1. General

Refer to Sections 27 00 00 - General Communications Requirements and 27 10 00 – Structured Cabling for guidelines regarding documentation requirements.

END OF SECTION 27 11 00