SECTION 270528 – PATHWAYS FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes:
   1. Communications equipment coordination and installation.
   2. Sleeves for pathways and cables.
   4. Common communications installation requirements.

1.2 RELATED DOCUMENTS
A. Related Sections:
   1. Section 270526 “Grounding & Bonding for Communication Systems”.
   2. Section 16130 “Raceway and Boxes for Electrical Systems”

1.3 QUALITY CONTROL
1. EIA/TIA 569A Compliance: Comply with EIA/TIA -569A Standards for Telecommunication Pathways and Spaces for Commercial Buildings.

1.4 SUBMITTALS
A. Product Data: For sleeves, seals, cable ladder and back-boxes.

1.5 COORDINATION
A. 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.

B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

C. 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 08 Section “Access Doors and Frames.”
D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping.".

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR COMMUNICATIONS INSTALLATION

A. Comply with NECA 1.

B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

C. 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.

D. 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.

E. Right of Way: Give to piping and sheet metal HVAC ductwork systems.

3.2 CABLE LADDER

A. Cable ladders shall be installed per manufacturer's instructions, utilizing product series accessories and components.

B. Cable ladders, supports and brackets shall be cleanly cut, deburred, and sharp edges removed.

C. Verify installed loading requirements and install the raceway system per the manufacturer's recommendations. Provide additional load capacity to support a 2X growth factor.

D. Install end caps, mounting spacers, couplings, hangers, brackets, dropouts, connectors, supports, and other manufacturer's accessories as required to provide a complete and functioning installation.

3.3 CONDUIT

A. Conduit shall be sized per Table 1 below, or as noted on the drawings. Where sections of conduit runs are longer than 100'-0", or have more than 180 degrees of bends, or have a reverse bend (greater than 90 degrees), pull boxes shall be provided and installed. Bends in conduit larger than 2" shall be long sweep type. Except where specifically noted, the inside radius of bends shall not be less than:

Six times the internal diameter for conduits 2" and smaller.

Ten times the internal diameter for conduits 2-1/2" and larger.
Table 1.

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<th>4.6 (0.18)</th>
<th>5.6 (0.22)</th>
<th>6.1 (0.24)</th>
<th>7.4 (0.29)</th>
<th>7.9 (0.31)</th>
<th>9.4 (0.37)</th>
<th>13.5 (0.53)</th>
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B. Conduits entering telephone and data closets shall terminate as close as possible to the wall through which the conduits enter, unless otherwise noted. In-floor conduit shall terminate 4" AFF or curb unless noted otherwise. All conduits shall be left clean, dry, and free of debris or other obstructions, with insulated grounding bushings installed.

C. Pull boxes shall be sized and installed per BISCI Standards.

D. Conduit, sleeves, and stubs through fire rated floors and walls shall be rigid galvanized steel conduit with insulated and/or grounding bushings per specifications. Conduit sleeves shall extend a minimum of 6" beyond each wall surface. Upon completion of the work, install fire stop per specifications and codes.

E. Furnish and install pipe sleeves as shown on the drawings. The sleeves shall extend 4" above the floor and a minimum of 2" below the bottom of the ceiling slab. The inner edges of the sleeve shall be reamed, providing a smooth surface to prevent damage to cable insulation. Sleeves shall be equipped with metal caps to ensure fireproofing between floors and/or insulated bushings when occupied with cable.

F. Feeder conduit should enter from the top or bottom, close to one side; never in the center. Distribution conduit should enter in the center.

G. Conduit for outlets shall turn toward the main pathway and have an insulated bushing installed.
3.4 MISCELLANEOUS

A. Raceway systems shall be bonded to the telecommunication grounding system per NEC Article 250, EIA/TIA 607 Standard, and Division 27, Section 27 05 26.

B. Provide a 1/8" nylon or polypropylene line in all conduits.

C. Where cable tray is specified or conduits are routed back to MDF or IDF Rooms or extended beyond the stub-out (greater than 3' from wall), install grounding bushing and bond to telecommunication grounding system.

3.5 SLEEVE INSTALLATION FOR COMMUNICATIONS PENETRATIONS

A. Communications penetrations occur when pathways, cables, wireways, or cable trays penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.

B. 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.

C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

D. 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.

E. Cut sleeves to length for mounting flush with both surfaces of walls.

F. Furnish and install pipe sleeves as shown on the drawings. The sleeves shall extend 4" above the floor and a minimum of 2" below the bottom of the ceiling slab. The inner edges of the sleeve shall be reamed, providing a smooth surface to prevent damage to cable insulation. Sleeves shall be equipped with metal caps to ensure fireproofing between floors and/or insulated bushings when occupied with cable.

G. 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.

H. 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 07 Section "Joint Sealants."

I. 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 07 Section "Penetration Firestopping."

J. Roof-Penetration Sleeves: Seal penetration of individual pathways and cables with flexible boot-type flashing units applied in coordination with roofing work.

K. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel 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.
L. 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.

3.6 SLEEVE-SEAL INSTALLATION

A. Install to seal exterior wall penetrations.

B. 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.

3.7 FIRESTOPPING

A. Apply firestopping 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 07 Section “Penetration Firestopping.”

END OF SECTION 270528