SECTION 28 0528 - PATHWAYS FOR ELECTRONIC SAFETY AND SECURITY

Maintain Section format, including the UH master spec designation and version date in bold in the center columns of the header and footer. Complete the header and footer with Project information.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

Delete hidden text after this Section has been edited for the Project.

Designer is required to adhere to the University's "Network Infrastructure Design Standards," "UH System IT Facilities: Baseline Standards," and "Electronic Access Control Design Guide" available in Owner's Design Guidelines on the University Information Technology and Facilities Planning and Construction web sites.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to work of this Section.

B. The Contractor's attention is specifically directed, but not limited, to the following documents for additional requirements:

1. The current version of the *Uniform General Conditions for Construction Contracts*, State of Texas, available on the web site of the Texas Facilities Commission.
2. The University of Houston's Supplemental General Conditions and Special Conditions for Construction.

1.2 SUMMARY

A. Section includes:

1. Interior security pathways and supports.
2. Outlet and conduit runs.
3. Risers in Security Rooms.
4. Grounding and bonding of pathways.
5. Pathway firestopping requirements.

1.3 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Follow requirements as stated in Section 01 3300 "Submittal Procedures." Use electronic format only.

1.4 ACTION SUBMITTALS

A. Provide Shop Drawings showing communications pathway routing to include:

1. Cable/Basket Tray Routing.
2. Interior Conduit routing and junction box locations for conduit 2-inch OD and larger.
3. Wall and Floor Sleeves or EZ-Paths.
4. Mounting height at base of pathway for all elements shown.
5. All outdoor pathway routing, including depth.
6. Security rough-in door details.
7. Conduit to pedestals.

B. Firestop material solutions

1. Product Data
2. Shop Drawings.

1.5 INFORMATION SUBMITTALS – NOT USED

PART 2 - PRODUCTS

2.1 PARTS AND MANUFACTURERS - PATHWAY

A. J-Hooks:

1. Panduit: JP131DW-L20
2. Panduit: JP4SBC50RB
3. Panduit: JP2W-L20

B. Comfort Cradles:

1. Tomarco/Stiffy 200 Series: 2-inch cradle.
2. Tomarco/Stiffy 200 Series: 3.5-inch cradle.

C. Hanger Supports:

1. Stiffy 200 Series Low Voltage Support Rods-01, 02, 011 pins as applicable.
2. 12-gauge or smaller roll hanger wire is not approved for low voltage support applications.

D. Maxcell

1. Edge Standard 3.00” MXE6428
2. Appropriate rating for installation environment, e.g., use Maxcell ISP Plenum in Plenum spaces.

E. Cable Tray:

1. Cablofil: 12-inch x 4-inch CF105/ 300 EZ
2. Cablofil: 18-inch x 4-inch CF105/ 450 EZ

a. Cablofil: 4” Tray Divider COT105

F. Trapeze Support Kits

1. Cooper B-Line: 9G-55XX-22SH

G. Wall-mounted Brackets.

1. Cooper B-Line: B409

H. Refer to Section 01 2500 “Substitution Procedures” for changes to approved manufacturers or parts. Obtain prior written approval for substitutions from both the Owner’s Project Manager and the EAC Project Manager.

2.2 CONDUITS AND FITTINGS

A. For each wired access control location, provide a complete assembly of conduit, tubing or duct with fittings including, but not necessarily limited to, connectors, nipples, couplings, locknuts, bushings, expansion fittings and other components and accessories as needed to form a complete system of the type indicated.

B. From each device, (i.e., card reader, lock assembly, request to exit, door position switch) run concealed conduit to a junction box above an accessible ceiling. Locate the junction box on the secured side of the opening.

C. Provide minimum ¾-inch conduit for security pathways.

D. Ream and install grommets on all sleeves before cable installation to prevent cable damage.

E. Do not use flexible conduit without written approval by Owner’s Project Manager and EAC Representative.

F. Refer to Division 26 0534 for acceptable raceways. All raceways to comply with ANSI/TIA 569.

2.3 WALL AND CEILING OUTLET BOXES

A. Provide outlet box accessories as required for each installation, including mounting brackets, wallboard hangers, extension rings, fixture studs, cable clamps and metal straps for supporting outlet boxes, compatible with the outlet boxes being used and meeting the requirements of each individual situation.

1. Do not locate wall outlet boxes back-to-back in the same stud wall cavity. Ensure that security, communications, and electrical outlet boxes are placed at least one stud or 16 inches apart when located on opposite sides of a partition wall.

2.4 PULL / JUNCTION BOXES

A. Provide pull boxes rated NEMA-1 for security conduits in interior locations. For damp or wet locations such as plumbing chases or outdoors, provide pull boxes rated NEMA-3R.

2.5 CABLE TRAY SECTIONS AND COMPONENTS

A. Provide metal cable trays of types, classes and sizes indicated, with splice plates, bolts, nuts and washers for connecting units. Construct units with rounded edges and smooth surfaces, in compliance with applicable standards and with the following additional construction features.

B. Provide cable trays with a minimum 4-inch usable load depth, or as noted on Drawings.

C. Supply straight sections in standard 10-foot lengths, except where shorter lengths are permitted to facilitate tray assembly lengths as shown on Drawings.

D. Tray Widths: as shown on Drawings.

E. Tray Fittings: Minimum radius of 24 inches.

F. Provide bolted type splice plates for each tray section. The resistance of fixed splice connections shall not exceed 0.00033 ohms.

G. Cable Tray Supports: Construct supports from 12-gauge steel formed shape channel members 1-5/8 inch by 1-5/8 inch with Trapeze Support Kits (9G-55XX-22SH) as manufactured by Cooper B-Line, Inc. Support cable trays installed adjacent to walls on wall-mounted brackets B409 as manufactured by Cooper B-Line, Inc.

H. Support trapeze hangers by rods of at least 1/2-inch diameter.

I. Barrier Strips: Place as indicated on Drawings and fasten into the tray with manufacturer approved hardware.

J. Accessories: Furnish special accessories as required to protect, support, and install a cable tray system. Accessories consist of but are not limited to section splice plates, expansion plates, blind-end plates, specially designed ladder dropouts, barriers, etc.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install composite Electronic Access Control cabling in conduit from each door to an accessible ceiling. More than one door may share a conduit pathway provided labeling is clear and 40 percent fill ratios are not exceeded.

B. Install the conduit pathway in the most direct route possible from the accessible ceiling to the device location.

C. Locate access control composite cabling in a separate pathway from other data or low voltage cabling. If conditions exist where a shared pathway such as basket tray is needed, provide physical separation between different systems. Install j-hooks or saddle bags on a basket tray trapeze. If composite cabling is installed within a tray system with other low voltage cabling, install a physical divider.

D. Install pathway for IP-based cameras or card readers per Section 27 0528 “Pathways for Communications.”

E. Use factory-manufactured sweeps that meet ANSI/TIA569 bend radius requirements for all security conduits.

F. Locate junction boxes in a serviceable, accessible space.

G. Do not loop or “daisy-chain” conduits between outlet boxes.

H. Route door device concealed conduits to an above ceiling junction box. Locate the junction box on the secured side of the opening and in an accessible ceiling.

I. Size all conduit to allow for 25 percent growth in cabling.

J. Install plastic bushings at conduit ends before pulling cable into the conduit.

K. Do not run conduits next to hot water lines, steam pipes, or other utilities that may present a safety hazard or cause a degradation of system performance.

L. Locate conduits entering the Security Room to allow for the greatest flexibility in the routing and racking of cables.

M. Terminate conduits or conduit sleeves entering through the floor of the Security Room at four inches above the finished floor.

N. Bond all metallic security conduits entering the Security Room, Equipment Room, or Entrance Facility together and to the room’s Grounding Busbar with a #6 AWG ground cable minimum.

O. Seal all in-use and spare conduits entering the Security Room, Equipment Room, or Entrance Facility to prevent the intrusion of water, gasses and rodents.

P. Provide firestopping for all conduits and cables that penetrate fire rated walls or floors. Label each penetration with a UL tag. Comply with requirements of Section 07 8413 “Penetration Firestopping.”

Q. Install pull lines rated at a minimum of 90 kg (200 lb) pulling tension in Outside Plant (OSP) conduits. Re-pull the pull lines each time an additional cable is installed.

R. Prior to releasing the conduit for the installation of cables, clean all OSP conduits with a brush pulled through the conduit at least two times in the same direction and swabbed with clean rags until the rag comes out of the conduit clean and dry.

S. Install composite Electronic Access Control cable pathways separate from power and IT pathways.

T. Route conduit system inside ceilings, floors and walls.

U. If surface-mounted conduit is required, immediately bring the problem to the attention of the Architect, Owner's Project Manager and EAC Representative. Obtain written approval Owner's Project Manager and University Architect prior to installation.

V. For ground floor, slab-on-carton forms constructed buildings, route conduit in walls and ceilings where possible. Where not possible, route conduit under-slab, directly from the device to the Security Room.

W. Provide minimum ¾-inch conduit to door rough-in device locations. All other locations shall have a minimum of 1-inch conduit. Increase the conduit size as necessary for the quantity of cables to be installed.

X. Maintain minimum pathway separation distances from electrical power as listed below:

1. 480V or greater: minimum 10 feet.
2. Large electrical motors or transformers: minimum 14 feet.
3. Lightning protection system conductors (NEC 800-13): minimum 6 feet.
4. Less than 480V: minimum 2 feet.
5. Fluorescent lighting: minimum 5 inches in perpendicular direction; 12 inches in parallel direction.
6. For branch circuits (secondary) power (120/240V, 20A) where electric light or power circuits coexist with security cabling: minimum 2 inches.

3.2 CLOSE-OUT DOCUMENTS

A. Provide As-Built Drawings in .rvt, .dwg and .pdf formats showing installed pathway routing and junction box locations for all security devices.

END OF SECTION 28 0528