SECTION 260544 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

Revise this Section by deleting and inserting text to meet Project-specific requirements.

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

See "Sustainable Design Considerations" Article in the Evaluations for a discussion of sustainable design requirements that may impact the editing of this Section.

1. GENERAL
	* + 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

* + - * 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			1. SUMMARY
				1. Section Includes:

Round sleeves.

Rectangular sleeves.

Sleeve seal systems.

Grout.

Pourable sealants.

Foam sealants

.Related Requirements:

Retain subparagraph below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 078413 "Penetration Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

* + - 1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each type of product.

USE PARAGRAPH BELOW WITH EPD REQUIREMENT WHEN PROJECT ESTIMATE IS $1M OR MORE.

* + - * 1. Submit an Environmental Product Declaration (EPD) from the manufacturer for steel pipe sleeves within this specification section, if available. A statement of the contractor’s good faith effort to obtain the EPD shall be provided if not available.

Manufacturer-provided EPDs must be Product Specific Type III (Third-Party Reviewed), in adherence with ISO 14025 *Environmental labels and declarations*, ISO 14044 *Environmental management – Life cycle assessment*, and ISO 21930 *Core rules for environmental product declarations of construction products and services.*

Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.

1. PRODUCTS

Manufacturers and products listed in SpecAgent and MasterWorks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications. For definitions of terms and requirements for Contractor's product selection, see Section 016000 "Product Requirements."

* + - 1. ROUND SLEEVES

Retain "Wall Sleeves, Steel" or "Wall Sleeves, Cast Iron" Paragraph below for penetrations through exterior walls above and below grade when placing sleeve during wall construction. If sleeves are required for penetrations of existing walls, consider use of non-flanged pipe sleeves made of standard Schedule 40 conduit cut flush at both sides of the wall.

* + - * 1. Wall Sleeves, Steel:

Description: ASTM A53/A53M, Type E, Grade B, Schedule 40, zinc coated, plain ends and integral waterstop.

* + - * 1. Wall Sleeves, Cast Iron:

Description: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop.

"Pipe Sleeves, PVC" Paragraph below may be prohibited by authorities having jurisdiction. These flanged sleeves are for penetrations through walls above and below grade when placing sleeve during wall construction. If sleeves are required for penetrations of existing walls, consider use of non-flanged pipe sleeves made of standard Schedule 40 conduit cut flush at both sides of the wall.

* + - * 1. Pipe Sleeves, PVC:

Description: ASTM D1785, Schedule 40.

"Molded sleeves, PVC" are extensions of the concrete form used to form holes through the concrete structure. They should be removed after the concrete is set. They can be cut flush at both sides of the structure and left in place only if the PVC sleeves are permitted by the authorities having jurisdiction. Because concrete does not adhere to the sleeves, they can be removed and reused.

* + - * 1. Molded Sleeves, PVC:

Description: With nailing flange for attaching to wooden forms.

"Molded sleeves, PE or PP" are extensions of the concrete form used to form holes through the concrete structure. They should be removed after the concrete is set. They can be cut flush at both sides of the structure and left in place only if the PE or PP sleeves are permitted by authorities having jurisdiction. Because concrete does not adhere to the sleeves, they can be removed and reused.

* + - * 1. Molded Sleeves, PE, or PP:

Description: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

Retain "Sheet Metal Sleeves, Galvanized Steel, Round" Paragraph below when required by authorities having jurisdiction for conduits penetrating non-fire-rated wall assemblies. NFPA 70 does not contain requirements for sleeves; IBC, Section 712, "Penetrations," does.

* + - * 1. Sheet Metal Sleeves, Galvanized Steel, Round:

Description: Galvanized-steel sheet; thickness not less than 0.0239-inch (0.6-mm); round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

* + - 1. RECTANGULAR SLEEVES
				1. Sheet Metal Sleeves, Galvanized Steel, Rectangular:

Description:

Material: Galvanized sheet steel.

Minimum Metal Thickness:

For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and with no side larger than 16 inches (400 mm), thickness must be 0.052 inch (1.3 mm).

For sleeve cross-section rectangle perimeter not less than 50 inches (1270 mm) or with one or more sides larger than 16 inches (400 mm), thickness must be 0.138 inch (3.5 mm).

* + - 1. SLEEVE SEAL SYSTEMS

Sleeve seal systems in this article are used for conduit penetrations in slabs-on-grade and in below-grade exterior walls.

* + - * 1. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable or between raceway and cable.

Retain first option in "Sealing Elements" Subparagraph below unless Nitrile (Buna N) rubber gasket material is required because hydrocarbons are present in the soil.

Sealing Elements: [**EPDM**] [**Nitrile (Buna N)**] rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.

Pressure Plates: [**Carbon steel**] [**Fiber-reinforced plastic**] [**Stainless steel**].

Connecting Bolts and Nuts: [**Carbon steel, with corrosion-resistant coating,**] [**Stainless steel**] of length required to secure pressure plates to sealing elements.

* + - 1. GROUT
				1. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.

Standard: ASTM C1107/C1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

Packaging: Premixed and factory packaged.

* + - 1. POURABLE SEALANTS

Retain this article when use of pourable sealants are permitted as an alternative to grout in sealing of conduit or cable penetrations.

* + - * 1. Description: Single-component, neutral-curing elastomeric sealants of grade indicated below.

Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.

Sustainability Criteria:

* + - 1. FOAM SEALANTS

Retain this article when use of foam sealants are permitted as an alternative to grout in sealing of conduit or cable penetrations.

* + - * 1. Description: Multicomponent, liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam. Foam expansion must not damage cables or crack penetrated structure.

Sustainability Criteria:

1. EXECUTION
	* + 1. INSTALLATION OF SLEEVES FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS
				1. Comply with NECA 1.
				2. Sleeves for Conduits Penetrating Above-Grade, Non-Fire-Rated, Concrete and Masonry-Unit Floors and Walls:

Interior Penetrations of Non-Fire-Rated Walls and Floors:

Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall or floor so no voids remain. Tool exposed surfaces smooth; protect material while curing.

Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."

Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

Retain last option in first subparagraph below when Project has stringent seismic requirements.

Size pipe sleeves to provide [**1/4-inch (6.4-mm)**] <**Insert dimension**> annular clear space between sleeve and raceway or cable, unless sleeve seal system is to be installed [**or seismic criteria require different clearance**].

Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.

Retain subparagraph below when unsleeved core-drilled openings in concrete floors are not allowed.

Install sleeves for floor penetrations. Extend sleeves installed in floors [**2 inches (50 mm)**] <**Insert dimension**> above finished floor level. Install sleeves during erection of floors.

* + - * 1. Sleeves for Conduits Penetrating Non-Fire-Rated Wall Assemblies:

Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.

Seal space outside of sleeves with approved joint compound for wall assemblies.

* + - * 1. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
				2. Aboveground, Exterior-Wall Penetrations: Seal penetrations using [**steel**] [**cast-iron**] pipe sleeves and mechanical sleeve seal systems. Size sleeves to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
				3. Underground, Exterior-Wall and Floor Penetrations:

Retain first subparagraph below if new walls or floors are being constructed below ground and the sleeves can be placed during construction.

Install [**steel**] [**cast-iron**] pipe sleeves with integral waterstops. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing sleeve seal system. Install sleeve during construction of floor or wall.

Retain subparagraph below if existing walls or floors are below ground and penetrations will be core drilled.

Install steel pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing sleeve seal system. Grout sleeve into wall or floor opening.

* + - 1. INSTALLATION OF RECTANGULAR SLEEVES AND SLEEVE SEALS

Rectangular sleeves are used where multiple conduits penetrate a wall at one location. The only practical way of sealing around the conduits inside the sleeve, other than fireproof systems specified in Section 078413 "Penetration Firestopping," is with expanding foam. Install sleeves in new walls as they are constructed.

* + - * 1. Install sleeves in existing walls without compromising structural integrity of walls. Do not cut structural elements without reinforcing the wall to maintain the designed weight bearing and wall stiffness.
				2. Install conduits and cable with no crossings within the sleeve.
				3. Fill opening around conduits and cables with expanding foam without leaving voids.
				4. Provide metal sheet covering at both wall surfaces and finish to match surrounding surfaces. Metal sheet must be same material as sleeve.
			1. INSTALLATION OF SLEEVE SEAL SYSTEMS

Sleeve seal systems in this article are used in slabs-on-grade and in below-grade exterior concrete walls for a watertight seal around service-piping entries into the building. These systems require installation in a sleeve for proper operation.

* + - * 1. Install sleeve seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.
				2. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

END OF SECTION 260544