1. GENERAL
	* + 1. SECTION INCLUDES
				1. Firestopping and smoke stopping of all penetrations through fire barriers, including:

Voids around:

Pipes (copper pipe and tubing, cast iron and steel pipe).

Conduit (EMT and ENT).

Cables and wires not in conduit.

Insulated pipes (Armaflex and fiberglass).

HVAC ducts (non-dampered).

Electrical Buss Ducts and Buss Bars.

Mixed penetrants through same opening.

Other openings, as required by authorities having jurisdiction.

Joints between smoke barriers and other construction.

Openings between structurally separate sections of wall or floors.

Gaps between the top of walls and ceilings or roof assemblies.

Expansion joints in walls and floors.

Openings around structural members which penetrate floors or walls.

* + - * 1. Section Does Not Include: Repairing penetrations made in error and repairing penetrations which are too large to be sealed by the methods indicated; these are to be repaired using the original material of the construction.
				2. Products Specified to be Furnished but Not Installed: Sleeves which are an integral part of the firestopping assembly but for which installation is specified in another Section.
	1. RELATED SECTIONS
		+ - 1. Division 3 Section– Cast In Place Concrete: Floor or wall penetrations.
				2. Division 7 Section– Building Insulation: Insulation products.
				3. Division 7 Section - Joint Sealers: Sealants for non-rated penetrations.
				4. Division 9 Section– Gypsum Board: Taping and joint compound to finish penetrations and openings in fire-rated construction.
				5. Division 22, 23, & 25 – Mechanical: Piping and ductwork penetrations.
				6. Division 28 – Fire Protection System: Fire Protection System piping penetrations.
				7. Division 26, 27, & 28 – Electrical: Conduit and raceway penetrations.

1.03 REFERENCES

* + - * 1. International Code Council: Sections 712 – Penetrations and 713 – Fire Resistant Joint Systems.
				2. Test Requirements: ASTM E814-13A, "Standard Method of Fire Tests of Through Penetration Fire Stops" (2013).
				3. Underwriters Laboratories (UL) of Northbrook, IL runs ASTM E814 under their designation of UL 1479 and publishes the results in their "FIRE RESISTANCE DIRECTORY" that is updated annually with a midyear supplement.

UL Fire Resistance Directory:

Through-Penetration Firestop Devices (XHCR)

Fire Resistance Ratings (BXUV)

Through-Penetration Firestop Systems (XHEZ)

Fill, Voids, or Cavity Material (XHHW)

Forming Materials (XHKU)

* + - * 1. Test Requirements: ASTM E1966 - "Standard Test Method for Fire Resistive Joint Systems" (2007).
				2. Test Requirements: ASTM E2307-04e1 - "Standard Test Method for Determining Fire-Resistance of Perimeter Fire Barrier System Using Intermediate-Scale Multi-Story Test Apparatus" (2004).
			1. DEFINITIONS
				1. Fire Barrier: Any wall, floor, or roof which is indicated as having a fire-resistance rating.
				2. Smoke Barrier: Any wall, floor, ceiling, or roof which is indicated as being designed to prevent passage of smoke and gases; may be indicated as "smoke barrier", "smoke partition", "smoke wall", etc.
				3. Firestopping: A material or combination of materials to retain the integrity of time-rated fire-resistive construction by maintaining an effective barrier against the spread of flame, smoke and gasses.
	1. SUBMITTALS
		+ - 1. Product Data: Complete product and system description, including tested assembly details, installation instructions, and limitations on use.
				2. Maintenance Data: Include detailed instructions for repair and for modification due to changes in penetrating items.
				3. Field Reports: Final inspection reports.

1.06 QUALITY ASSURANCE

* + - * 1. Testing Requirements: Testing shall have been conducted or witnessed by an independent testing agency acceptable to authorities having jurisdiction.

Test method: ASTM E814 or UL 1479 (Smokestopping) and ASTM E1966 or UL 2079 (Firestopping), for fill material of annular space which shall prevent the passage of flame and hot gasses.

A current ICC Evaluation Service Report (ICC ESR) or CABO National Evaluation Service Report (NER) will be considered evidence of acceptable testing, if acceptable to authorities having jurisdiction.

* + - * 1. One firestop manufacturer shall be used for the entirety of applications on this project unless otherwise approved by the architect of record. The manufacturer will be required to furnish UL tested systems for all applications pertaining to the project, in addition to material safety data sheets and all other relevant information.
				2. A manufacturer's direct representative (not distributor or agent) to be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.
				3. Firestop System installation must meet requirements of ASTM E-814, ASTM E2307, ASTM E1966 and UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.

Positive pressure in accordance with 2 California Building Code (CBC) for ratings. Reference: CBC Section 713.6.

Comply with UL Standard 2079 for top of wall assemblies.

Conform to CBC Section 712.3.1.1 or 712.3.1.2.

* + - * 1. For those firestop applications that exist for which no UL tested system is available through any manufacturer, a manufacturer's engineering judgment derived from similar UL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgment drawings must follow requirements set forth by the International Firestop Council (September 7, 1994).

1.07 DELIVERY, STORAGE, AND HANDLING

* + - * 1. Delivery: Coordinate delivery of products to minimize storage time at site. Deliver products to Project site in original unopened containers bearing the name of the manufacturer, product name, type, and testing agency's identification mark.
				2. Storage: Store products in accordance with manufacturer's instructions.
	1. PROJECT CONDITIONS
		+ - 1. Coordination Meeting: Prior to the start of Work which involves cutting penetrations, conduct a meeting with installers of such Work to identify fire and smoke barriers and required configurations of penetrations and to discuss the proper procedures and time schedule for cutting, patching, and sealing penetrations in such assemblies, with emphasis on avoiding unnecessary cutting and patching.

1.09 SEQUENCING AND SCHEDULING

* + - * 1. Perform firestopping and smokestopping Work after completion of Work which penetrates fire and smoke barriers, but prior to covering up or eliminating access to the penetration. Coordinate with related Work specified in other Sections.

1.10 INSTALLER QUALIFICATIONS

* + - * 1. Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacture as having the necessary experience, staff, and training to install manufacture’s products per specified requirements. A manufacture’s willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on the buyer.
1. PRODUCTS

2.01 MANUFACTURERS

* + - * 1. Acceptable Manufacturers: Products of the manufacturers listed below will be acceptable.

A/D Fire Protection Systems; local representative Mission Viejo, CA (949/458-2853).

Bio Fireshield, Inc., Concord, MA (617/369-7700; local representative Architectural Accents, Inc., Fullerton, CA 714/441-3418).

Grace Construction Products, Cambridge, MA (800/354-5414; local representative Mission Viejo, CA 949/586-1991).

Hilti, Inc., Tulsa, OK (918/252-6901).

3M/Construction Markets Department, St. Paul, MN (612/736-0203).

Nelson Firestop Products, Tulsa, OK (800/331-7325).

The Rectorseal Corp., Houston, TX (800/231-3345; local representative Architectural Accents, Inc., Fullerton, CA 714/441-3418).

Specified Technologies Inc., Somerville, NJ (800/992-1180; local representative Irvine, CA 949/559-4886).

Tremco, Inc., Beechwood, OH; local representative Simi Valley, CA (562/254-0821 or 800/527-4098).

2.02 FIRESTOPPING AND SMOKESTOPPING MATERIALS

* + - * 1. Firestopping Materials: Provide penetration seal assemblies whose fire-resistance ratings have been determined by testing in the configurations required and which have fire-resistance ratings at least as high as that of the fire-rated assembly in which they are to be installed.

It shall be the Contractor's responsibility to determine the types of penetrations to be sealed and to select appropriate firestopping assemblies.

If a tested assembly is not available for a particular penetration configuration, modify the penetration configuration to suit available assemblies; do not modify assembly configuration except as specifically stated in the test report or as approved by the authority having jurisdiction.

Provide products which:

Allow normal expansion and contraction movement of the penetrating item without failure of the penetration seal.

Emit no hazardous, combustible, or irritating by-products during installation or curing period.

Do not require special tools for installation.

* + - * 1. Smokestopping: Use any gunnable or pourable joint sealant suitable for the application; use only fully curing types where accessible in the finished Work. Provide products which:

Allow normal expansion and contraction movement of the penetrating item without failure of the penetration seal.

Emit no hazardous, combustible, or irritating by-products during installation or curing period.

Do not require special tools for installation.

* + - * 1. Use only firestop products that have been UL 1479, ASTM E1966, ASTM E2307, ASTM E814, or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.
				2. For penetrations by non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following materials are acceptable:

Hilti CP604 Self-Leveling Firestop Sealer.

Hilti FS-ONE High Performance Intumescent Firestop Sealant.

3M Fire Stop Sealant 2000

3M Fire Barrier CP25 WB

Tremco Tremstop Fyre-Sil Sealant

Grace Flamesafe FS900+ Elastomeric Sealant

Grace Flamesafe FS1900 Intumescent Sealant

* + - * 1. For fire-rated construction joints and other gaps, the following materials are acceptable:

Hilti CP 604 Self-Leveling Firestop Sealer

Hilti CP 601s Elastomeric Firestop Sealant

Hilti CP 606 Flexible Firestop Sealant

Hilti CP 672 Firestop Joint Spray

3M Firestop Sealant 2000

Tremco Tremstop Fyre-Sil Sealant

Grace Flamesafe FS900+ Elastomeric Sealant

Grace Flamesafe FS3000 Elastomeric Spray

* + - * 1. For penetrations by combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe (closed piping systems), the following materials are acceptable:

Hilti CP 658T Firestop Plug

Hilti FS-ONE High Performance Intumescent Firestop Sealant

Hilti CP 618 Firestop Putty

Hilti CP 644 Firestop Collar

Hilti CP 648 Firestop Collar

Hilti CP 643N Firestop Collar

Hilti CP 648S Firestop Wrap Strip

3M Fire Barrier CP25 WB

3M Fire Barrier FS-195 Wrap/Strip

Tremco Tremstop WBM Intumescent Firestop Sealant

Grace Flamesafe FS900+ Elastomeric Sealant

Grace Flamesafe FS1900 Intumescent Sealant

Grace Flamesafe FSP1000 Putty

* + - * 1. For penetrations by combustible plastic pipe (open piping systems), the following materials are acceptable:

Hilti CP 648E Firestop Wrap Strip

Hilti CP 648S Firestop Wrap Strip

Hilti CP 643N Firestop Collar

Hilti CP 644 Firestop Collar

Hilti FS-ONE High Performance Intumescent Firestop Sealant

3M Fire Barrier PPD Plastic Pipe Device

Grace Flamesafe FSWS Wrapstrip and FSWSD Device

Grace Flamesafe FSIS Intumescent Sleeve

* + - * 1. For large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following materials are acceptable:

Hilti CP 620 Fire Foam

Hilti CP 637 Firestop Mortar

Hilti FS 657 Fire Block

3M Firestop Foam 2001

3M Fire Barrier CS-195 Composite Sheet

Grace Flamesafe Mortar

Grace Flamesafe Bags

* + - * 1. For openings between structurally separate sections of wall and floors. Top-of-walls, the following materials are acceptable:

Hilti CP 672 Firestop Joint Spray

Hilti CP 601s Elastomeric Firestop Sealant

Hilti CP 606 Flexible Firestop Sealant

3M Fire Barrier CP 25 WB

Grace Flamesafe FS3000 Elastomeric Spray

Grace Flamesafe FS900+ Elastomeric Sealant

Grace Flamesafe FS Silicone

* + - * 1. For cast-in-place openings through fire-rated floors, the following materials are acceptable:

Hilti CP 680 Cast-In Firestop Device

Hilti CP 682 Cast-In Firestop Device

Architect approved equivalent

* + - * 1. Labels: Red, permanent marking using the words "Fire-Rated Assembly - Do not disturb - See maintenance instructions" and the testing agency designation, or equivalent as approved by the authority having jurisdiction.

For marking firestopping and smokestopping assemblies, use self-adhesive tape or wired-on labels.

For marking fire and smoke barriers themselves, use letters at least 2 inches high.

1. EXECUTION

3.01 EXAMINATION

* + - * 1. Pre-Installation Inspection: Inspect all fire and smoke barriers for penetrations of any type; mark or otherwise identify all penetrations indicating action required: 1) repair; 2) firestopping; or 3) smokestopping.

Conduct inspection prior to covering up or enclosing walls or ceilings.

Conduct inspection jointly with authorized representative of authority having jurisdiction.

* + - * 1. If the configuration of a particular penetration does not conform to the configuration necessary for the required firestopping assembly, notify the installer of the penetration for modification of the configuration to suit the assembly; do not use the firestopping assembly in other configurations except as specifically stated in the test report or as approved by the authority having jurisdiction.

3.02 PREPARATION

* + - * 1. Prepare penetrations in accordance with the material manufacturer's instructions.

3.03 INSTALLATION

* + - * 1. Install firestopping materials in exact accordance with manufacturer's instructions and the conditions of the testing; provide all accessory materials required.
				2. Remove combustible forming materials, unless they are a required component of the tested assembly.

3.04 PERMANENT IDENTIFICATION OF PENETRATIONS

* + - * 1. Near fire and smoke barriers, mark each exposed penetration with label identifying it as a fire-stopped or smoke-stopped assembly.

3.05 FIELD QUALITY CONTROL

* + - * 1. Inspect completed installations for completeness and correct installation. Inspect in accordance with ASTM E2174 Guidelines for Inspection.

If installed Work is to be covered in completed Work, inspect and obtain approval prior to covering.

Obtain the approval of the authority having jurisdiction.

Submit report of inspection to the District’s Representative.

3.05 CLEANING

* + - * 1. Clean up excess material adjacent to penetrations promptly; use methods and materials approved by the manufacturers of the penetration seals and of surfaces to be cleaned.

3.06 PROTECTION

* + - * 1. Protect installed Work during curing period.
				2. Protect installed Work from damage from construction operations using substantial barriers as necessary.
				3. Repair damaged materials in accordance with manufacturer's instructions.

END OF SECTION