SECTION 07 84 00

FIRESTOPPING

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\*\* NOTE TO SPECIFIER \*\*

 STI Firestopping; firestopping products and materials.
This section is based on the products of STI Firestopping, which is located at:

210 Evans Way
Somerville, NJ 08876
Toll Free: 800-992-1180
Phone: 908-526-8000
Email: specseal@stifirestop.com
Web: http://www.stifirestop.com

 [ [Click Here](https://arcat.com/company/specified-technologies-inc-35657) ] for additional information.
STI leads the industry in developing innovative fire protection systems that help stop the spread of fire, smoke, and hot gases. For over 30 years, our team has worked hand in hand with the construction industry to create simple solutions to complex firestopping problems. Our SpecSeal� and EZ Path� product lines are engineered to deliver powerful performance. Because our system designs are user-driven, they are easier to apply. The result is simply designed, outstanding fire protection systems which often result in lower installed costs. STI products and systems offer innovative firestop solutions for all types of new construction and retrofit applications. Since firestopping is our only business, we concentrate all our resources on providing the highest quality, fully tested, innovative firestopping solutions.

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. General Firestopping: For through-penetrations and joints in or between the following fire-resistance rated assemblies, including both blank openings, linear openings, and openings containing penetrating items:
			1. Floor-ceiling assemblies.
			2. Roof-ceiling assemblies.
			3. Walls and partitions.
			4. Smoke barriers.
			5. Construction enclosing compartmentalized areas.
		2. Fire-Resistive Joint Systems: For linear voids within or between fire-resistance rated floor and roof-ceiling assemblies and walls and partitions, including the following types of joints:
			1. Expansion joints and control joints or joints between floor structures.
			2. Floor-to-wall joints where a floor structure intersects a wall structure.
			3. Head-of-wall joints where a wall or partition intersects a roof or floor-ceiling assembly.
			4. Control joints within or between wall structures.
		3. Perimeter Fire Containment Systems: Consisting of a floor with an hourly fire-resistance rating, an exterior wall assembly with no hourly fire-resistance rating, and the fill and forming materials installed between the floor and curtain wall for preventing the spread of fire vertically in buildings.
		4. Firestopping, Smoke, and Acoustical Sealing Telecommunications Data Cabling:
			1. Firestopping of Through Penetrations in Fire Rated Assemblies.
			2. Smoke and Acoustical Sealing in Non-Rated Assemblies.
	1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 03 30 00 - Cast-In-Place Concrete.
		2. Section 04 22 00 - Concrete Unit Masonry.
		3. Section 07 90 00 - Joint Protection.
		4. Section 09 25 23 - Plaster and Gypsum Board.
		5. Section 22 40 00 - Plumbing.
		6. Section 22 07 00 - Plumbing Insulation.
		7. Section 23 00 00 - HVAC.
		8. Section 23 07 13 - HVAC Insulation.
		9. Section 26 00 00 - Electrical.
		10. Section 27 00 00 - Communications.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. American Society of Testing and Materials (ASTM):
			1. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
			2. ASTM C1193 - Standard Guide for Use of Joint Sealants.
			3. ASTM D6094 - Standard Guide to Assess the Compostability of Environmentally Degradable Nonwoven Fabrics.
			4. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
			5. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
			6. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
			7. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems.
			8. ASTM E1725 - Standard Test Methods for Fire Tests of Fire-Resistive Barrier Systems for Electrical System Components.
			9. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.
			10. ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestop Systems.
			11. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus.
			12. ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers.
			13. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies.
		2. American National Standards Institute (ANSI):
			1. ANSI/TIA-1179-A - The Healthcare Facility Telecommunications Infrastructure Standard.
			2. ANSI/TIA-EIA-569-D - Telecommunications Pathways and Spaces.
		3. FM Global (FM):
			1. FM 4991 - Standard for Approval of Firestop Contractors.
		4. International Building Code (IBC).
		5. National Fire Protection Association (NFPA):
			1. NFPA 101 - Life Safety Code.
			2. NFPA 70 - National Electrical Code.
		6. Underwriters Laboratories, Inc. (UL):
			1. UL 263 - Fire Tests of Building Construction and Materials.
			2. UL 723 - Surface Burning Characteristics of Building Materials.
			3. UL 1479 - Fire Tests of Through Penetration Firestops.
			4. UL 1489 - Standard for Fire Tests of Fire Resistance Pipe Protection Systems Carrying Combustible Liquids.
			5. UL 2079 - Tests for Fire Resistance of Building Joint Systems.
		7. Underwriters Laboratories, Inc. Canada (ULC):
			1. CAN/ULC S115 - Standard Method of Fire Tests of Firestops Systems.
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		2. Product Data: For each type of firestopping product indicated demonstrating compliance with referenced standards and listing numbers of systems in which each product is to be used.
		3. System Drawings: Submit documentation from a qualified third-party testing agency that is applicable to each firestopping system configuration for construction, joint opening width and/or penetrating items.
			1. Schedule of UL System Drawings for Fire Rated Construction: Submit schedule of all expected opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance ratings.
			2. UL System Drawings for Fire Rated Construction: Furnish copies of all UL Systems identified in schedule above. Include any engineering recommendations.
		4. Product Certificates: Certificate of conformance signed by manufacturers of firestopping products certifying that products comply with requirements.

\*\* NOTE TO SPECIFIER \*\* Delete if not applicable to product type.

* + 1. Verification Samples: Two representative units of each type, size, pattern, and color.
		2. Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.
		3. Installation Instructions: Submit manufacturer's printed installation instructions.
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.
		2. Provide systems that comply with the following requirements and those specified in "Performance Criteria" Article:
			1. Firestopping tests are performed by a qualified, testing and inspection agency. A qualified testing and inspection agency is UL, or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.
			2. Products bear classification marking of qualified testing and inspection agency.
		3. Engage an experienced installer who is certified, licensed, FM Approved in accordance with FM 4991, Certified by UL as a Qualified Contractor, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install firestop products per specified requirements. A manufacturer's willingness to sell its firestopping products to Contractor or to an installer engaged by Contractor does not in itself confer qualifications on buyer.
		4. Obtain firestop systems for each type of penetration or joint opening ort slab-edge configuration and construction condition indicated from a single manufacturer.
		5. Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings".

\*\* NOTE TO SPECIFIER \*\* Include mock-up if the project size or quality warrant the expense. The following is one example of how a mock-up on might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
			1. Intent of mock-up is to demonstrate quality of workmanship and visual appearance.
			2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
			3. Retain mock-up during construction as a standard for comparison with completed work.
			4. Do not alter or remove mock-up until work is completed or removal is authorized.
	1. DELIVERY, STORAGE AND HANDLING
		1. Deliver products to Project site in original, unopened containers or packages with intact and legible manufacturer's labels identifying product and manufacturer, date of manufacture; lot number; shelf life, if applicable; qualified testing and inspection agency's classification marking; and mixing instructions for multi-component materials.
		2. Store and handle materials for firestopping products to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.
	2. PROJECT CONDITIONS
		1. Do not install products when ambient or substrate temperatures are outside limitations recommended by manufacturer.
		2. Do not install products when substrates are wet due to rain, frost, condensation, or other causes.
		3. Do not use materials that contain flammable solvents.
		4. Do not install water-based or products that are conductive when wet in contact with energized electrical conductors. Exercise care when energizing penetrants.
	3. COORDINATION
		1. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.
		2. Coordinate sizing of sleeves, openings, core-drilled holes or cut openings to accommodate through-penetration firestop systems.
		3. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.
	4. WARRANTY
		1. Manufacturer's standard limited warranty unless indicated otherwise.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: STI Firestopping, which is located at: 210 Evans Way, Somerville, NJ 08876; Toll Free: 800-992-1180; Phone: 908-526-8000; Email: specseal@stifirestop.com; Web: http://www.stifirestop.com
	2. PERFORMANCE REQUIREMENTS

\*\* NOTE TO SPECIFIER \*\* Delete paragraph options not required.

* + 1. Firestopping:
			1. Fire Test Requirements:
				1. Underwriters Laboratories, Inc. (UL):

UL 1479 - Fire Tests of Through Penetration Firestops.

UL 263 - Fire Tests of Building Construction and Materials.

UL 723 - Surface Burning Characteristics of Building Materials.

UL 1489 - Standard for Fire Tests of Fire Resistance Pipe Protection Systems Carrying Combustible Liquids.

* + - * 1. American Society of Testing and Materials (ASTM):

ASTM E84 - Surface Burning Characteristics of Building Materials.

ASTM E119 - Fire Tests of Building Construction and Materials.

ASTM E814 - Fire Tests of Penetration Fire Stops.

ASTM E1725 - Standard Test Methods for Fire Tests of Fire-Resistive Barrier Systems for Electrical System Components.

ASTM E2174 - Standard Practice for On Site Inspection of Installed Fire Stops.

* + - 1. References:
				1. Underwriters Laboratories (UL) - Fire Resistance Directory.

Through Penetration Firestop Systems (XHEZ)

Joint Systems (XHBN)

Perimeter Fire Containment Systems (XHDG)

Continuity Head-of-Wall Joint Systems (XHBO)

Fill, Void, or Cavity Materials (XHHW)

Firestop Devices (XHJI)

Forming Materials (XHKU)

Wall Opening Protective Materials (CLIV)

Fire-Resistant Pipe-Protection Systems (HNKJ)

* + - * 1. Major Building Codes:

\*\* NOTE TO SPECIFIER \*\* Delete the following codes not required.

International Building Code published by ICC.

NFPA 101 - Life Safety Code.

NFPA 70 - National Electrical Code.

FM 4991 - Standard for Approval of Firestop Contractors.

UL Qualified Firestop Contractor Program.

* + - 1. Products that upon curing do not re-emulsify, dissolve, leach, breakdown, or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water, or other forms of moisture characteristic during and after construction.
			2. When intumescent products are used, provide products that do not contain sodium silicate or any other water soluble intumescent ingredient in the formulation.
			3. Firestop products that do not contain ethylene glycol.
			4. Firestop sealants sufficiently flexible to accommodate motion such as pipe vibration, water hammer, thermal expansion, and other normal building movement without damage to the seal.
			5. Pipe insulation shall not be removed, cut away or otherwise interrupted through wall or floor openings. Provide products appropriately tested for the thickness and type of insulation utilized.
			6. Fire rated pathway devices shall be the preferred product and shall be installed in all locations where frequent cable moves, add-ons and changes will occur. Such devices shall be:
				1. Capable of retrofit around existing cables
				2. Designed such that two or more devices can be ganged together
				3. Maintenance free such that no action is required to activate the smoke and fire sealing mechanism
			7. When mechanical cable pathways are not practical, openings within walls and floors designed to accommodate voice, data and video cabling shall be provided with re-enterable products specifically designed for retrofit.
			8. Fire-resistive joint sealants sufficiently flexible to accommodate movement such as thermal expansion and other normal building movement without damage to the seal.
			9. Fire-resistive joint sealants designed to accommodate a specific range of movement and tested for this purpose in accordance with a cyclic movement test criteria as outlined in Standards, ASTM E1966, or ANSI/ UL 2079.
			10. Penetration firestop systems, fire-resistive joint systems, or perimeter fire barrier systems subjected to an air leakage test conducted in accordance with Standard, ANSI/ UL1479 for penetrations and ANSI/UL2079 for joint systems with published L-Ratings for ambient and elevated temperatures as evidence of the ability of firestop system to restrict the movement of smoke.
			11. Penetrants passing through fire-resistance rated floor-ceiling assemblies contained within chase wall assemblies shall be protected with products tested by being fully exposed to the fire outside of the chase wall. Systems within the UL Fire Resistance Directory that meet this criterion are identified with the words "Chase Wall Optional."
			12. T-Rating Collar Devices tested in accordance with ASTM E814 or ANSI/UL1479 for metallic pipe penetrations requiring T-Ratings per the applicable building code.
			13. Fire-rated grommet for all individual or small grouped cable applications up to 0.53 in. (14 mm).
			14. Moisture-curing products where inclement weather or greater than transient water exposure is expected.
		1. Fire-Resistive Joint Systems
			1. Fire and Cyclic Movement Test Requirements
				1. Underwriters Laboratories, Inc. (UL):

UL 2079, "Tests for Fire Resistance of Building Joint Systems".

UL 263 - Fire Tests of Building Construction and Materials.

UL 723 - Surface Burning Characteristics of Building Materials.

* + - * 1. American Society of Testing and Materials (ASTM):

ASTM E84 - Surface Burning Characteristics of Building Materials.

ASTM E119 - Fire Tests of Building Construction and Materials.

ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.

ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus.

ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestop Systems.

ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers.

ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies.

* + - 1. References:
				1. UL Fire Resistance Directory.

Joint Systems (XHBN).

Perimeter Fire Containment Systems (XHDG).

Continuity Head-of-Wall Joint Systems (XHBO).

Fill, Void, or Cavity Materials (XHHW).

Forming Materials (XHKU).

* + - * 1. Major Building Codes: Including local codes at Project location.

International Building Code published by ICC.

\*\* NOTE TO SPECIFIER \*\* Delete the following codes not required.

NFPA 101 - Life Safety Code.

NFPA 70 - National Electrical Code.

FM 4991 - Standard for Approval of Firestop Contractors.

UL Qualified Firestop Contractor Program.

* + - * 1. ASTM C1193 - Standard Guide for Use of Joint Sealants.
			1. Performance Requirements:
				1. Products that upon curing, do not re-emulsify, dissolve, leach, breakdown or otherwise deteriorate over time from exposure to atmospheric moisture, ponding water, or other forms of moisture characteristic during and after construction.
				2. Fire-resistive joint sealants:

Sufficiently flexible to accommodate movement such as thermal expansion and other normal building movement without seal damage.

To accommodate a specific range of movement and tested for this purpose in accordance with a cyclic movement test criteria as outlined in Standards, ASTM E 1966, ASTM E2837, or UL 2079.

* + - * 1. Fire-resistive joint systems subjected to an air leakage test conducted in accordance with Standard, UL 2079 with published L-Ratings for ambient and elevated temperatures as evidence of the ability of the fire-resistive joint system to restrict the movement of smoke.
				2. Firestop products that do not contain ethylene glycol.
		1. Building Perimeter Firestopping Requirements:
			1. General: Fire test investigation must be conducted on the Intermediate-Scale, Multi-Story Test Apparatus (ISMA structure).
			2. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
			3. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus.
			4. ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers.
			5. UL 723 - Surface Burning Characteristics of Building Materials.
			6. References:
				1. UL Fire Resistance Directory.

Perimeter Fire Containment Systems (XHDG)

Fill, Void, or Cavity Materials (XHHW)

Forming Materials (XHKU)

Curtain Wall Insulation (XHGU)

* + - * 1. Major Building Codes: Including local codes at Project location.

\*\* NOTE TO SPECIFIER \*\* Delete the following codes not required.

International Building Code published by ICC.

NFPA 101 - Life Safety Code.

FM 4991 - Standard for Approval of Firestop Contractors.

UL Qualified Firestop Contractor Program.

* + - 1. Performance Requirements:
				1. Products that upon curing, do not re-emulsify, dissolve, leach, breakdown or otherwise deteriorate over time from exposure to atmospheric moisture, ponding water, or other forms of moisture characteristic during and after construction.
				2. Sealants sufficiently flexible to accommodate movement such as thermal expansion, inter-story differential building sway and other normal building movement without damage to the seal.
				3. Perimeter fire containment systems subjected to an air leakage test conducted in accordance with Standard, UL 2079 with published L-Ratings for ambient and elevated temperatures as evidence of the ability of the fire-resistive joint system to restrict the movement of smoke.
				4. Moisture-curing products where inclement weather or greater than transient water exposure is expected.
		1. Firestopping, Smoke, and Acoustical Sealing Telecommunications Data Cabling:
			1. References:
				1. ANSI/TIA-1179-A - The Healthcare Facility Telecommunications Infrastructure Standard.
				2. ANSI/TIA-EIA-569-D - Telecommunications Pathways and Spaces,
				3. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
				4. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems.
				5. ASTM E1725 - Standard Test Methods for Fire Tests of Fire-Resistive Barrier Systems for Electrical System Components.
				6. CAN/ULC S115 - Standard Method of Fire Tests of Firestops Systems.
				7. NFPA 70 - National Electrical Code.
				8. NFPA 101 - Life Safety Code.
				9. UL - Fire Resistance Directory.
				10. UL 1479 - Fire Tests of Through Penetration Firestops.
			2. Fire rated cable pathway devices shall be used in fire-rated construction for all low-voltage, video, data and voice cabling, optical fiber raceways and certain high-voltage cabling where frequent cable moves, adds and changes may occur. Pathways required for high voltage cabling will be detailed on the prints. Such devices shall:
				1. Meet the hourly fire-rating of fire rated wall and or floor penetrated.
				2. Be tested for the surrounding construction and cable types involved.
				3. Have UL Systems permitting cable loads from; Zero to 100 percent Visual Fill. This requirement eliminates need for fill-ratio calculations to be made by cable technicians to ensure cable load is within maximum allowed by UL System.
				4. Be "Maintenance-Free," having a corresponding Evaluation Services Report from a Nationally Recognized Third Party Laboratory. Maintenance-Free is defined as; No action required by cabling technician to open and/or close pathway for cable moves, adds or changes, such as, but not limited to:

Opening or closing of doors.

Spinning rings to open or close fabric liner.

Removal and or replacement of any material such as, but not limited to, firestop caulk, putty, pillows, bags, foam muffins, foam, foam plugs, foam blocks, or foam closures of any sort.

Evaluation Services Report (ESR) from an accredited Nationally Recognized Third-party Laboratory certifying compliance with this definition of "Maintenance-Free" and all relevant codes and standards.

* + - * 1. Pathways shall be engineered such that two or more devices may be ganged together for larger cable capacities.
				2. Pathways shall be engineered to be re-enterable so they can be retrofitted and removed from around existing cables without cutting and re-splicing them.
				3. Affix adhesive wall label immediately adjacent to devices to communicate to future cable technicians, authorities having jurisdiction and others the manufacturer of the device and the corresponding UL System number installed.
			1. Non-rated cable pathway devices shall be used in non-fire-rated construction for all low-voltage, video, data and voice cabling, optical fiber raceways and certain high-voltage cabling where frequent cable moves, adds and changes may occur. Pathways required for high voltage cabling will be detailed on the prints. Such devices shall:
				1. Limit the movement of smoke and sound of wall and or floor penetrated.
				2. Restore the STC Rating of the penetrated assembly.
				3. Provide L Ratings of greater than 1 CFM when empty and greater than 2.5 cfm at all other loading up to 100 percent.
				4. Accommodate cable loads from; Zero to 100 percent Visual Fill.
				5. Not have inner fabric liner that tightens around and compresses cables tightly together encouraging potential cable damage or interference.
				6. Be "Maintenance-Free," maintenance-free is defined as; No action required by cabling technician to open and/or close pathway for cable moves, adds or changes, such as, but not limited to:

Opening or closing of doors.

Spinning rings to open or close fabric liner.

Removal and or replacement of any material such as, but not limited to, firestop caulk, putty, pillows, bags, foam muffins, foam, foam plugs, foam blocks, or foam closures of any sort.

Furnish letter from manufacturer certifying compliance with this definition of "Zero-Maintenance."

* + - * 1. Pathways shall be engineered such that two or more devices may be ganged together for larger cable capacities.
				2. Pathways shall be engineered to be re-enterable so they can be retrofitted and removed from around existing cables without cutting and re-splicing them.
				3. Affix adhesive wall label immediately adjacent to devices to communicate to future cable technicians, authorities having jurisdiction and others the manufacturer of the device and the corresponding UL System number installed.
			1. As an alternate to using a fire-rated or non-rated cable pathway device for a single or tow low voltage cables (up to an aggregate cross sectional area of 0.52 in. (14mm) O.D.) penetrating one or two-hour, gypsum board/stud wall assemblies or non-rated assemblies, either as a through-penetration or as a membrane-penetration, a fire-rated cable grommet may be substituted. The product shall consist of a molded, two-piece, plenum-rated grommet having a foam fire and smoke sealing membrane that conforms to the outside diameter of the individual cable. The grommet product shall be capable of locking into place to secure the cable penetration within the wall assembly. The grommet shall be UL Classified and tested to the requirements of ASTM E814 (UL 1479) and CAN/ULC S115.
			2. Where non-mechanical pathways must be utilized, such as sealing (caulking) around single or grouped conduits, provide products that upon curing do no re-emulsify, dissolve, leach, breakdown or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water, or other forms of moisture characteristic during or after construction. Provide letter from manufacturer certifying compliance with this section.
			3. Cable pathway shall replace conduit sleeves in walls and floors, and the following;
				1. When installed individually in floors, devices shall pass through core-drilled or preformed opening utilizing tested floor plates.
				2. When multiple units are ganged in floors, devices shall be anchored by means of a tested grid.
				3. When installed individually in walls, devices shall pass through core drilled opening utilizing tested wall plates or integrated flanges.
				4. When multiple units are ganged in walls, devices shall be anchored by means of a tested adjustable gang bracket.
			4. Cable tray shall terminate at each barrier and resume on the other side such that cables pass independently through devices. Cable tray shall be properly supported on each side of the barrier.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required or delete paragraph and product options not required.

* 1. GENERAL FIRESTOPPING
		1. Through-penetration firestop systems that are compatible with one another, with the substrates forming openings, and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.
			1. Components for each through-penetration firestop system that are needed to install fill materials. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.
			2. Use only firestopping products that have been tested for specific fire-resistance-rated construction conditions conforming to construction assembly type, penetrating item type or joint opening width and movement capabilities, annular space requirements, and fire-rating involved for each separate instance.
		2. Intumescent Sealants: Single component intumescent latex formulations containing no water soluble intumescent ingredients capable of expanding a minimum 8 times.
			1. Product: Specified Technologies, Inc. SpecSeal Series SSS Intumescent Sealant.
			2. Product: Specified Technologies, Inc. SpecSeal Series LCI Intumescent Sealant.
		3. Endothermic Sealants: Single component latex formulations that upon cure do not re-emulsify during exposure to moisture.
			1. Product: Specified Technologies, Inc. SpecSeal Series LC Endothermic Sealant.
		4. Elastomeric Sealants: Single component latex formulations that upon cure do not re-emulsify during exposure to moisture and accommodate minimum plus or minus 25 percent movement. Products shall be tested for use in construction joints incorporating floors and structural steel elements protected with Spray-applied Fire Resistive Materials when present.
			1. Product: Specified Technologies, Inc. SpecSeal Series AS Elastomeric Spray.
			2. Product: Specified Technologies, Inc. SpecSeal Series ES Elastomeric Sealant.
		5. Latex Sealants: Single component latex formulations that upon cure do not re-emulsify during exposure to moisture. When installed in contact with CPVC piping systems, shall be deemed compatible as determined by the respective CPVC Manufacturer.
			1. Product: Specified Technologies, Inc. SpecSeal Series SSS Intumescent Sealant.
			2. Product: Specified Technologies, Inc. SpecSeal Series LCI Intumescent Sealant.
			3. Product: Specified Technologies, Inc. SpecSeal Series LC Endothermic Sealant.
		6. Firestop Devices: Factory-assembled steel collars lined with intumescent material capable of expanding a minimum 30 times sized to fit specific outside diameter of penetrating item.
			1. Product: Specified Technologies, Inc. SpecSeal Series SSC Firestop Collars.
			2. Product: Specified Technologies, Inc. SpecSeal Series LCC Firestop Collars.
		7. Fire Rated Cable Pathways: Gangable device modules capable of being retrofitted around existing cables and comprised of steel raceway with intumescent foam pads allowing 0 to 100 percent cable fill and requiring no additional action in the form of plugs, twisting closure, putty, pillow, or sealant to achieve fire and leakage ratings.
			1. Product: Specified Technologies Inc. EZ-Path Fire Rated Pathway.
		8. Wall Opening Protective Materials: Intumescent, non-curing pads or inserts for protection of electrical switch and receptacle boxes to reduce horizontal separation to less than 24 inch (610 mm).
			1. Product: Specified Technologies, Inc. SpecSeal Series SSP Firestop Putty Pads.
			2. Product: Specified Technologies, Inc. SpecSeal Series EP PowerShield Insert Pads.
		9. Firestop Putty: Intumescent, 100 percent solids, non-hardening, water resistant, butyl rubber based putties containing no solvents or silicone compounds.
			1. Product: Specified Technologies, Inc. SpecSeal Series SSP Firestop Putty.
		10. Wrap Strips: Single component intumescent elastomeric strips faced on both sides with a plastic film and capable of expanding a minimum 30 times.
			1. Product: Specified Technologies, Inc. SpecSeal Series RED2 Wrap Strip.
			2. Product: Specified Technologies, Inc. SpecSeal Series BLU2 Wrap Strip.
		11. Firestop Pillows: Re-enterable, non-curing, mineral fiber core encapsulated with an intumescent coating on all six sides contained in a flame retardant poly bag.
			1. Product: Specified Technologies, Inc. SpecSeal Series SSB Firestop Pillows.
		12. Mortar: Portland cement based dry-mix product formulated for mixing with water at Project site to form a non-shrinking, water-resistant, homogenous mortar.
			1. Product: Specified Technologies, Inc. SpecSeal Series SSM Firestop Mortar.
		13. Silicone Sealants: Moisture curing, single component, silicone elastomeric sealant for horizontal surfaces (pourable or nonsag) or vertical surface (nonsag).
			1. Product: Specified Technologies, Inc. SpecSeal SIL300 Silicone Firestop Sealant.
			2. Product: Specified Technologies, Inc. SpecSeal SIL300 SL Self-Leveling Silicone Firestop Sealant.
		14. All-Weather Coatings: Moisture curing, single component silicone copolymer elastomeric spray coatings for horizontal surfaces where greater water resistance is required or inclement weather is anticipated. Coating shall meet ASTM D6094 early rain resistance test for full 24 Hour Duration.
			1. Product: Specified Technologies, Inc. SpecSeal FT305 Firestop Spray.
		15. Silicone Foam: Multicomponent, silicone-based liquid elastomers, that when mixed, expand and cure in place to produce a flexible, non-shrinking foam.
			1. Product: Specified Technologies, Inc. Pensil 200 Silicone Foam.
		16. Composite Sheet: Intumescent material sandwiched between a galvanized steel sheet and steel wire mesh protected with aluminum foil capable of sustaining a minimum 2,500 lbs (1,134 kg) when subjected to load testing.
			1. Product: Specified Technologies, Inc. SpecSeal CS Composite Sheet.
		17. Cast-In-Place Firestop Device: Single component molded firestop device installed on forms prior to concrete placement with totally encapsulated, tamper-proof integral firestop system and smoke sealing gasket.
			1. Product: Specified Technologies, Inc. SpecSeal CD Cast-In Firestop Device
		18. Fire-Rated HVAC Retaining Angles: Steel angle system with integral intumescent firestop gasket for use on steel HVAC ducts.
			1. Product: Specified Technologies, Inc. SpecSeal FyreFlange Firestop Angles
		19. Firestop Plugs: Re-enterable, foam rubber plug impregnated with intumescent material capable of expanding minimum 10 times with expansion beginning at 350 degrees F (177 degrees C) for use in blank openings and cable sleeves.
			1. Product: Specified Technologies, Inc. SpecSeal Series FP Firestop Plug
		20. Firestop Blocks: Intumescent urethane foam blocks used for medium and large openings as well as complex penetrations made to accommodate cables, cable trays, and various pipe constructions. The intumescent foam blocks may be used in both temporary or permanent applications. The following products are acceptable:
			1. Product: Specified Technologies, Inc. (STI) SpecSeal Series SBR Firestop Blocks.
		21. Fire-Rated T Rating Collar Device: Louvered steel collar system with synthetic aluminized polymer coolant wrap installed on metallic pipes where T Ratings are required by applicable building code requirements.
			1. Product: Specified Technologies, Inc. SpecSeal T-Collar Device
		22. Fire-Rated Cable Grommet: Molded two-piece grommet made from plenum grade polymer with a foam inner core for sealing cable penetrations up to 0.53 inches. (14 mm) diameter.
			1. Product: Specified Technologies, Inc. EZ-Firestop Grommet (RFG1 or RFG2)
		23. Fire-Rated Closet Flange Gasket: Molded, single-component, intumescent gasket for use beneath a closet flange in floor applications.
			1. Product: Specified Technologies, Inc. SpecSeal Series CF34 Closet Flange Firestop Gasket
		24. Protective Wrap: Endothermic Wrap incorporating foil scrim evaluated for protection of cable pathways, liquid fuel lines, as well as in through-penetration and membrane-penetration firestopping. Testing to incorporate protection of Electrical Metallic Tubing (EMT), Rigid Metallic Conduit (RMC), Cable Trays, single and/or multi containment liquid fuel lines. Wrap to have a maximum weight of no greater than 1.4 lbs/ft2 and allow for the use of steel tie wire when installed around piping, conduits, and/or cable trays.
			1. Product: Specified Technologies, Inc. E-Wrap Endothermic Wrap.
		25. Fire rated cable pathway devices shall be used in fire-rated construction for all low-voltage, video, data and voice cabling, optical fiber raceways and certain high-voltage cabling where frequent cable moves, adds and changes may occur. Pathways required for high voltage cabling will be detailed on the prints. Such devices shall:
			1. Meet the hourly fire-rating of fire rated wall and or floor penetrated.
			2. Be tested for the surrounding construction and cable types involved.
			3. Have UL Systems permitting cable loads from; "Zero to 100 percent Visual Fill." This requirement eliminates need for fill-ratio calculations to be made by cable technicians to ensure cable load is within maximum allowed by UL System.
			4. Be "Maintenance-Free," having a corresponding Evaluation Services Report from a Nationally Recognized Third Party Laboratory. Maintenance-Free is defined as; No action required by cabling technician to open and/or close pathway for cable moves, adds or changes, such as, but not limited to:
				1. Opening or closing of doors.
				2. Spinning rings to open or close fabric liner.
				3. Removal and or replacement of any material such as, but not limited to, firestop caulk, putty, pillows, bags, foam muffins, foam, foam plugs, foam blocks, or foam closures of any sort.
				4. Evaluation Services Report (ESR) from an accredited Nationally Recognized Third-party Laboratory certifying compliance with this definition of "Maintenance-Free" and all relevant codes and standards.
			5. Pathways shall be engineered such that two or more devices may be ganged together for larger cable capacities.
			6. Pathways shall be engineered to be re-enterable so they can be retrofitted and removed from around existing cables without cutting and re-splicing them.
			7. Affix adhesive wall label immediately adjacent to devices to communicate to future cable technicians, authorities having jurisdiction and others the manufacturer of the device and the corresponding UL System number installed.
		26. Non-rated cable pathway devices shall be used in non-fire-rated construction for all low-voltage, video, data and voice cabling, optical fiber raceways and certain high-voltage cabling where frequent cable moves, adds and changes may occur. Pathways required for high voltage cabling will be detailed on the prints. Such devices shall:
			1. Limit the movement of smoke and sound of wall and or floor penetrated.
			2. Restore the STC Rating of the penetrated assembly.
			3. Provide L Ratings of greater than 1 cfm when empty and greater than 2.5 cfm at all other loading up to 100 percent.
			4. Accommodate cable loads from; "Zero to 100 percent Visual Fill."
			5. Not have inner fabric liner that tightens around and compresses cables tightly together encouraging potential cable damage or interference.
			6. Be "Maintenance-Free," maintenance-free is defined as; No action required by cabling technician to open and/or close pathway for cable moves, adds or changes, such as, but not limited to:
				1. Opening or closing of doors.
				2. Spinning rings to open or close fabric liner.
				3. Removal and or replacement of any material such as, but not limited to, firestop caulk, putty, pillows, bags, foam muffins, foam, foam plugs, foam blocks, or foam closures of any sort.
				4. Furnish letter from manufacturer certifying compliance with this definition of "Zero-Maintenance."
			7. Pathways shall be engineered such that two or more devices may be ganged together for larger cable capacities.
			8. Pathways shall be engineered to be re-enterable so they can be retrofitted and removed from around existing cables without cutting and re-splicing them.
			9. Affix adhesive wall label immediately adjacent to devices to communicate to future cable technicians, authorities having jurisdiction and others the manufacturer of the device and the corresponding UL System number installed.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required or delete paragraph and product options not required.

* 1. FIRE-RESISTIVE JOINT SYSTEM PRODUCTS
		1. General: Fire-resistive joint system products that are compatible with one another, with the substrates forming openings, under conditions of service and application, as demonstrated by fire-resistive joint system product manufacturer based on testing and field experience.
			1. Components for each fire-resistive joint system that are needed to install fill materials. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.
			2. Use only perimeter fire containment system products that have been tested for specific fire-resistance-rated construction to non-rated construction conditions conforming to construction assembly type, linear void width, and fire-rating involved for each separate instance
		2. Elastomeric Sealants: Single component latex formulations that upon cure do not re-emulsify during exposure to moisture and accommodate minimum plus or minus 25 percent movement. Products shall be tested for use in construction joints incorporating floors and structural steel elements protected with Spray-applied Fire Resistive Materials when present.
			1. Product: Specified Technologies, Inc. SpecSeal Series AS Elastomeric Spray
			2. Product: Specified Technologies, Inc. SpecSeal Series ES Elastomeric Sealant
		3. Silicone Sealants: Moisture curing, single component, silicone elastomeric sealant for horizontal surfaces (pourable or nonsag) or vertical surface (nonsag). Sealant shall be suitable for use in interior and exterior joint conditions.
			1. Product: Specified Technologies, Inc. SpecSeal SIL300 Silicone Firestop Sealant
			2. Product: Specified Technologies, Inc. SpecSeal SIL300 SL Self-Leveling Silicone Firestop Sealant'
		4. All-Weather Coatings: Moisture curing, single component silicone copolymer elastomeric spray coatings for horizontal surfaces where greater water resistance is required or inclement weather is anticipated. Coating shall meet ASTM D6094 early rain resistance test for full 24 Hour Duration.
			1. Product: Specified Technologies, Inc. SpecSeal FT305 FastTack Firestop Spray
		5. Joint Gasketing: Intumescent gasketing with pressure sensitive adhesive capable of +/- 100 percent movement and suitable for use in head-of-wall, wall-to-wall, bottom-of-wall, and perimeter fire barrier joints.
			1. Product: Specified Technologies, Inc. SpeedFlex TTG Track Top Gasket.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required or delete paragraph and product options not required.

* 1. PERIMETER FIRE-CONTAINMENT SYSTEMS PRODUCTS
		1. General: Perimeter fire containment system products that are compatible with one another, with the substrates forming openings, under conditions of service and application, as demonstrated by perimeter fire containment system product manufacturer based on testing and field experience.
			1. Components for each perimeter fire containment system that are needed to install fill materials. Use components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated perimeter fire containment systems.
			2. Use perimeter fire containment system products that have been tested for specific fire-resistance-rated construction to non-rated construction conditions conforming to construction assembly type, linear void width, and fire-rating involved for each separate instance.
		2. All-Weather Coatings: Moisture curing, single component silicone copolymer elastomeric spray coatings for horizontal surfaces where greater water resistance is required or inclement weather is anticipated. Coating shall meet ASTM D6094 early rain resistance test for full 24 Hour Duration.
			1. Product: Specified Technologies, Inc. SpecSeal FT305 FastTack Firestop Spray.
		3. Perimeter Fire Barrier Spray: Single component latex formulation with a solids content of minimum 65 percent and a cured Shore A Hardness equal to or greater than 65.
			1. Product: Specified Technologies, Inc. SpecSeal Safing Spray.
		4. Curtain Wall Insulation: Faced or unfaced batts or blankets used for exterior curtain walls with the capacity to contribute to the fire-resistance of the assembly.

\*\* NOTE TO SPECIFIER \*\* Select Firespan 40 for 4.0 pcf or Firespan 90 for 8 pcf. Delete insulation option not required.

* + - 1. Product: Thermafiber, LLC. FIRESPAN 40 Insulation. PCF: 4.0.
			2. Product: Thermafiber, LLC. FIRESPAN 90 Insulation. PCF: 8.0.
		1. Safing Insulation: Board or sheet products used as forming materials in slab-edge openings with the capacity to provide a degree of the fire resistance required when used with an appropriate fill material.
			1. Product: Thermafiber, LLC. Safing Insulation.
		2. Curtain Wall Insulation Hangers: Steel clip system designed to snap/clip onto aluminum framing members minimizing or eliminating the use of screws or other mechanical fasteners. Clips to include impaling staple to mechanically fasten curtain wall insulation to clip. Clips shall be available in a range of sizes based on mullion width and insulation thickness.
			1. Product: Specified Technologies, Inc. SpecSeal Quick Clip Perimeter Fire Barrier System.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required or delete paragraph and product options not required.

* 1. FIRESTOPPING, SMOKE, AND ACOUSTICAL SEALING TELECOMMUNICATIONS AND DATA CABLING
		1. General: Use only products that have been tested for specific fire resistance rated construction conditions or acoustical and smoke related requirements conforming to construction assembly type, penetrating item type, annular space requirements, and rating involved for each separate instance.
		2. Firestop Sealants: Single component latex formulations that upon cure do not re-emulsify during exposure to moisture.
			1. Product: Specified Technologies Inc. SpecSeal Series SSS Sealant.
			2. Product: Specified Technologies Inc. SpecSeal Series LCI Sealant.
		3. Firestop Putty: Intumescent, non-hardening, water resistant putties containing no solvents, inorganic fibers, or silicone compounds.
			1. Product: Specified Technologies Inc. SpecSeal Series SSP Putty.
		4. Firestop Pillows: Re-enterable, non-curing, mineral fiber core encapsulated on six sides with intumescent coating contained in a flame retardant poly bag.
			1. Product: Specified Technologies Inc. SpecSeal Series SSB Pillows.
		5. Fire-Rated Cable Grommet: Molded, two-piece grommet with an integral fire and smoke sealing foam membrane for sealing individual cable penetrations through framed wall assemblies. Grommet snaps together around cable and locks tightly into the wall.
			1. Product: Specified Technologies Inc. EZ-Firestop Grommets.
		6. Fire-Rated Cable Pathways: Device modules comprised of steel pathway with self-adjusting intumescent foam pads allowing 0 to 100 percent cable fill.
			1. Product: Specified Technologies Inc. EZ-PATH Fire Rated Pathway.
		7. Smoke and Acoustical Pathways: Device module comprised of a nonmetallic pathway with integral self-adjusting smoke and sound sealing system for cable penetrations through non-fire-resistance rated wall or floor assemblies.
			1. Product: Specified Technologies Inc. EZ-PATH Smoke & Acoustical Pathway.
		8. Protective Wrap: Endothermic Wrap incorporating foil scrim evaluated for protection of cable pathways, liquid fuel lines, as well as in through-penetration and membrane-penetration firestopping. Testing to incorporate protection of Electrical Metallic Tubing (EMT), Rigid Metallic Conduit (RMC), Cable Trays, single and/or multi containment liquid fuel lines. Wrap to have a maximum weight of no greater than 1.4 lbs per sq ft and allow for the use of steel tie wire when installed around piping, conduits, and/or cable trays.
			1. Product: Specified Technologies, Inc. E-Wrap Endothermic Wrap.
1. EXECUTION
	1. PREPARATION
		1. Do not begin installation until substrates have been properly constructed and prepared.
			1. Examination of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
		2. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.
	2. PREPARATION
		1. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, scale, laitance, rust, release agents, water repellents, and any other substances that may inhibit optimum adhesion.
		2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
			1. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
	3. FIRESTOPPING INSTALLATION
		1. General Requirements: Install through-penetration firestop systems and fire-resistive joint systems in accordance with "Performance Criteria" Article, the conditions of testing and classification as specified in the published design, and in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
			1. Seal openings or voids made by penetrations to ensure an air and water resistant seal.
			2. Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of through-penetration firestop systems that might hamper the performance of fire dampers as it pertains to duct work.
			3. Protect materials from damage on surfaces subjected to traffic.
			4. Apply a suitable bond-breaker to prevent three-sided adhesion in applications where this condition might occur such as the intersection of a gypsum wallboard/steel stud wall to floor or roof assembly where the joint is backed by a steel ceiling runner or track.
			5. Where joint application is exposed to the elements, fire-resistive joint sealant must be approved by manufacturer for use in exterior applications and shall comply with ASTM C920, "Specification for Elastomeric Joint Sealants".
	4. PERIMETER FIRE CONTAINMENT SYSTEM INSTALLATION
		1. General Requirements: Install perimeter fire containment systems in accordance with "Performance Criteria" Article, conditions of testing and classification as specified in the published design, and in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
			1. Seal all slab-edge openings to ensure an air and water-resistant seal.
			2. Curtain wall insulation that is an integral component of the perimeter fire containment system shall be installed in accordance with the conditions of testing and classification as specified in the published design and shall comply with thermal insulation requirements as specified in Section 07 21 19 - "Thermal Insulation".
			3. Safing insulation shall be installed with the grain oriented vertically to maintain effective compression between edge of floor assembly and curtain wall.
	5. FIELD QUALITY CONTROL
		1. Inspections: Owner shall engage a qualified independent inspection agency to inspect through-penetration firestop systems in accordance with ASTM E2174, "Standard Practice for On Site Inspection of Installed Fire Stops" or joint systems in accordance with ASTM E2393, "Standard Practice for On Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers".

\*\* NOTE TO SPECIFIER \*\* Manufacturers are not qualified inspection agencies, and it is a conflict of interest for the manufacturer to perform inspections of installed firestopping systems according to the aforementioned inspection standards.

* + 1. Keep areas of work accessible until inspection by authorities having jurisdiction.
		2. Where deficiencies are found, repair or firestopping products so they comply with requirements.
		3. Place system stickers on each side of wall penetrations.
		4. Place a reproduction (photocopy) of the UL System description in a document protector and mount to the wall next to the wall penetration
			1. Highlight the section of the system description that list the allowed cable types.
	1. ADJUSTING AND CLEANING
		1. Remove equipment, materials, and debris, leaving area in undamaged, clean condition.
		2. Clean all surfaces adjacent to sealed openings to be free of excess firestopping materials and soiling as work progresses.

END OF SECTION