SECTION 078443

JOINT FIRESTOPPING

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 this Section.

1.2 SUMMARY

A. Section Includes:

1. Joints in or between fire-resistance-rated constructions.
2. Joints at exterior curtain-wall/floor intersections.
3. Joints in smoke barriers.

B. Related Requirements:

1. Section 078413 "Penetration Firestopping" for penetrations in fire-resistance-rated walls, horizontal assemblies, and smoke barriers and for wall identification.
2. Section 079513.13 "Interior Expansion Joint Cover Assemblies" for fire-resistive manufactured expansion-joint cover assemblies for interior floors, walls, and ceilings.
3. Section 079513.16 "Exterior Expansion Joint Cover Assemblies" for fire-resistive manufactured expansion-joint cover assemblies for exterior building walls, soffits, and parapets.
4. Section 092216 "Non-Structural Metal Framing" for firestop tracks for metal-framed partition heads.

C. Single Subcontract Responsibilities:

1. Refer to Section 084413 "Window and Curtain Walls" for requirements of single subcontract responsibilities for perimeter fire-resistive joint systems used in conjunction with window and curtain walls.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Data: For sealants, indicating VOC content.
2. Laboratory Test Reports: For sealants, indicating compliance with requirements for low-emitting materials.

C. Shop Drawings: For each joint firestopping system, show each kind of construction condition in which joints are installed; also show relationships to adjoining construction. Include joint firestopping system design designation of testing and inspecting agency acceptable to authorities having jurisdiction that demonstrates compliance with requirements for each condition indicated.

D. Product Schedule: For each joint firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing agency.

1. Engineering Judgments: Where Project conditions require modification to a qualified testing agency's illustration for a particular joint firestopping system condition, submit illustration, with modifications marked, approved by joint firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each joint firestopping system, for tests performed by a qualified testing agency.

1.6 CLOSEOUT SUBMITTALS

A. Installer Certificates: From Installer indicating that joint firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Installer shall be comply with the qualifications in Option 1 or Option 2 as follows:

1. Option 1: A firm that has been approved by FM Approvals according to FM Approvals 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements."
2. Option 2: A firm with two years minimum experience in installing joint firestopping systems, who employs at least one individual with a demonstrated knowledge of the FCIA Firestop Manual of Practice, and is approved by the joint firestopping manufacturer to install their products.
3. Refer to Section 084413 "Window and Curtain Walls" for requirements of single subcontract responsibilities for perimeter fire-resistive joint systems used in conjunction with window and curtain walls.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not install joint firestopping systems when ambient or substrate temperatures are outside limits permitted by joint firestopping system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

B. Install and cure joint firestopping systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

1.9 COORDINATION

A. Coordinate construction of joints to ensure that joint firestopping systems can be installed according to specified firestopping system design.

B. Coordinate sizing of joints to accommodate joint firestopping systems.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics:

1. Perform joint firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
2. Test per testing standards referenced in "Joint Firestopping Systems" Article. Provide rated systems complying with the following requirements:

    a. Joint firestopping systems shall bear classification marking of a qualified testing agency.

        1) UL in its "Fire Resistance Directory."
        2) Intertek Group in its "Directory of Listed Building Products."

2.2 JOINT FIRESTOPPING SYSTEMS

A. Joint Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which joint firestopping systems are installed. Joint firestopping systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.

B. Joints in or between Fire-Resistance-Rated Construction: Provide joint firestopping systems with ratings determined per ASTM E1966 or UL 2079.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. 3M Fire Protection Products.

b. A/D Fire Protection Systems Inc.
c. Hilti, Inc.
d. Nelson Firestop; a brand of Emerson Industrial Automation.
e. RectorSeal.
f. Rockwool International.
g. Specified Technologies, Inc.
h. Thermafiber, Inc.; an Owens Corning company.
i. Tremco, Inc.

2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the wall, floor, or roof in or between which it is installed.

C. Joints at Exterior Curtain-Wall/Floor Intersections: Provide joint firestopping systems with rating determined per ASTM E2307.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. 3M Fire Protection Products.
b. Hilti, Inc.
c. Nelson Firestop; a brand of Emerson Industrial Automation.
d. RectorSeal.
e. Rockwool International.
f. Specified Technologies, Inc.
g. Thermafiber, Inc.; an Owens Corning company.
h. Tremco, Inc.

2. F-Rating: Equal to or exceeding the fire-resistance rating of the floor assembly.

D. Joints at Exterior Curtain-Wall/Floor Intersections Where Vision Glass Extends to the Floor: For joints between edges of fire-resistance-rated floor assemblies and exterior curtain walls where vision glass extends to the floor, provide materials installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E 119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch of water column for the time period at least equal to the fire-resistance rating of the floor assembly.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. 3M Fire Protection Products.
b. Hilti, Inc.
c. Nelson Firestop; a brand of Emerson Industrial Automation.
d. RectorSeal.
e. Rockwool International.
f. Specified Technologies, Inc.
g. Thermafiber, Inc.; an Owens Corning company.
h. Tremco, Inc.

2. Time Period: Equal to or exceeding the fire-resistance rating of the floor assembly.

E. Joints in Smoke Barriers: Provide joint firestopping systems with ratings determined per UL 2079 based on testing at a positive pressure differential of 0.30-inch wg.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. 3M Fire Protection Products.
b. A/D Fire Protection Systems Inc.
c. Hilti, Inc.
d. Nelson Firestop; a brand of Emerson Industrial Automation.
e. RectorSeal.
f. Rockwool International.
g. Specified Technologies, Inc.
h. Thermafiber, Inc.; an Owens Corning company.
i. Tremco, Inc.

2. L-Rating: Not exceeding 5.0 cfm/ft. of joint at both ambient and elevated temperatures.

F. Exposed Joint Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E84.

1. Sealant shall have a VOC content of 250 g/L or less.
2. Sealant shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," CDPH standard method version 1.2.

G. Accessories: Provide components of joint firestopping systems, including primers and forming materials, that are needed to install elastomeric fill materials and to maintain ratings required. Use only components specified by joint firestopping system manufacturer and approved by the qualified testing agency for conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Before installing joint firestopping systems, clean joints immediately to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:

1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of elastomeric fill materials or compromise fire-resistive rating.
2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with elastomeric fill materials. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form-release agents from concrete.

B. Prime substrates where recommended in writing by joint firestopping system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

A. General: Install joint firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming materials and other accessories of types required to support elastomeric fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing elastomeric fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.

C. Install elastomeric fill materials for joint firestopping systems by proven techniques to produce the following results:

1. Elastomeric fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
2. Apply elastomeric fill materials so they contact and adhere to substrates formed by joints.
3. For elastomeric fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

A. Joint Identification: Identify joint firestopping systems with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of joint edge so labels are visible to anyone seeking to remove or joint firestopping system. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:

1. The words "Warning - Joint Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's name, address, and phone number.
3. Designation of applicable testing agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

3.5 FIELD QUALITY CONTROL

A. Inspecting Agency: Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E2393.

B. Where deficiencies are found or joint firestopping systems are damaged or removed due to testing, repair or replace joint firestopping systems so they comply with requirements.

C. Proceed with enclosing joint firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

A. Clean off excess elastomeric fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by joint firestopping system manufacturers and that do not damage materials in which joints occur.

B. Provide final protection and maintain conditions during and after installation that ensure joint firestopping systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated joint firestopping systems immediately and install new materials to produce joint firestopping systems complying with specified requirements.

3.7 JOINT FIRESTOPPING SYSTEM SCHEDULE

A. Where UL-classified systems are indicated, they refer to system numbers in UL's "Fire Resistance Directory" under product Category XHBN or Category XHDG.

B. Where Intertek Group-listed systems are indicated, they refer to design numbers in Intertek Group's "Directory of Listed Building Products" under product category Expansion/Seismic Joints or Firestop Systems.

C. Floor-to-Floor, Joint Firestopping Systems FRJS-01:

1. UL-Classified Systems: FF-D-0000-0999.
2. Assembly Rating: Hour rating equal to or exceeding the fire-resistance rating of the floor.
3. Nominal Joint Width: As indicated, but less than or equal to 2 inches.
4. Movement Capabilities: Class II - 25 percent compression or extension, unless otherwise indicated.
5. L-Rating at Ambient: Less than 5.0 cfm per square foot of penetration opening for each through-penetration firestop system, or a total cumulative leakage of 50 cfm for any 100 square feet of wall area or floor area.
6. L-Rating at 400 Deg F: Less than 5.0 cfm per square foot of penetration opening for each through-penetration firestop system, or a total cumulative leakage of 50 cfm for any 100 square feet of wall area or floor area.
7. W-Rating: No leakage of water at completion of water leakage testing.

D. Wall-to-Wall, Joint Firestopping Systems FRJS-02:

1. UL-Classified Systems: WW-D-0000-0999.
2. Assembly Rating: Hour rating equal to or exceeding the fire-resistance rating of the wall.
3. Nominal Joint Width: As indicated, but less than or equal to 2 inches.
4. Movement Capabilities: Class II - 25 percent compression or extension, unless otherwise indicated.
5. L-Rating at Ambient: Less than 5.0 cfm per square foot of penetration opening for each through-penetration firestop system, or a total cumulative leakage of 50 cfm for any 100 square feet of wall area or floor area.
6. L-Rating at 400 Deg F: Less than 5.0 cfm per square foot of penetration opening for each through-penetration firestop system, or a total cumulative leakage of 50 cfm for any 100 square feet of wall area or floor area.

E. Floor-to-Wall, Joint Firestopping Systems FRJS-03:

1. UL-Classified Systems: FW-D-0000-0999.
2. Assembly Rating: Hour rating equal to or exceeding the fire-resistance rating of the wall.
3. Nominal Joint Width: As indicated, but less than or equal to 2 inches.
4. Movement Capabilities: Class II - 25 percent compression or extension, unless otherwise indicated.
5. L-Rating at Ambient: Less than 5.0 cfm per square foot of penetration opening for each through-penetration firestop system, or a total cumulative leakage of 50 cfm for any 100 square feet of wall area or floor area.
6. L-Rating at 400 Deg F: Less than 5.0 cfm per square foot of penetration opening for each through-penetration firestop system, or a total cumulative leakage of 50 cfm for any 100 square feet of wall area or floor area.

F. Head-of-Wall, Fire-Resistive Joint Firestopping Systems FRJS-04:

1. UL-Classified Systems: HW-D-0000-0999.
2. Intertek Group-Listed Systems: As indicated.
3. Assembly Rating: Hour rating equal to or exceeding the fire-resistance rating of the wall.
4. Nominal Joint Width: As indicated, but less than or equal to 2 inches.
5. Movement Capabilities: Class II - 50 percent compression or extension, unless otherwise indicated.
6. L-Rating at Ambient: Less than 5.0 cfm per square foot of penetration opening for each through-penetration firestop system, or a total cumulative leakage of 50 cfm for any 100 square feet of wall area or floor area.
7. L-Rating at 400 Deg F: Less than 5.0 cfm per square foot of penetration opening for each through-penetration firestop system, or a total cumulative leakage of 50 cfm for any 100 square feet of wall area or floor area.

G. Bottom-of-Wall, Joint Firestopping Systems FRJS-05:

1. UL-Classified Systems: BW-D-0000-0999.
2. Assembly Rating: Hour rating equal to or exceeding the fire-resistance rating of the wall.
3. Nominal Joint Width: As indicated, but less than or equal to 2 inches.
4. Movement Capabilities: Class II - 25 percent compression or extension, unless otherwise indicated.

5. L-Rating at Ambient: Less than 5.0 cfm per square foot of penetration opening for each through-penetration firestop system, or a total cumulative leakage of 50 cfm for any 100 square feet of wall area or floor area.
6. L-Rating at 400 Deg F: Less than 5.0 cfm per square foot of penetration opening for each through-penetration firestop system, or a total cumulative leakage of 50 cfm for any 100 square feet of wall area or floor area.

H. Wall-to-Wall, Joint Firestopping Systems Intended for Use as Corner Guards FRJS-06:

1. UL-Classified Systems: CG-D-0000-0999.
2. Assembly Rating: Hour rating equal to or exceeding the fire-resistance rating of the wall.
3. Nominal Joint Width: As indicated, but less than or equal to 2 inches.
4. Movement Capabilities: Class II - 25 percent compression or extension, unless otherwise indicated.
5. L-Rating at Ambient: Less than 5.0 cfm per square foot of penetration opening for each through-penetration firestop system, or a total cumulative leakage of 50 cfm for any 100 square feet of wall area or floor area.
6. L-Rating at 400 Deg F: Less than 5.0 cfm per square foot of penetration opening for each through-penetration firestop system, or a total cumulative leakage of 50 cfm for any 100 square feet of wall area or floor area.

I. Perimeter Joint Firestopping Systems PFRJS-07:

1. UL-Classified Perimeter Fire-Containment Systems: CW-D-1000-1999.
2. Intertek Group-Listed, Perimeter Fire-Barrier Systems: As indicated.
3. Integrity Rating: Hour rating equal to or exceeding the fire-resistance rating of the floor.
4. Insulation Rating: Hour rating equal to or exceeding the fire-resistance rating of the floor.
5. Linear Opening Width: As indicated, but greater than 2 inches, and less than or equal to 6 inches.
6. Movement Capabilities: Class II - 25 percent compression or extension, unless otherwise indicated.
7. F-Rating: Hour rating equal to or exceeding the fire-resistance rating of the floor.

J. Perimeter Joint Firestopping Systems PFRJS-08:

1. Test Method: ASTM E 119.
2. Linear Opening Width: As indicated.
3. Movement Capabilities: Class II - 25 percent compression or extension, unless otherwise indicated.
4. Time Period: Time period equal to or exceeding the fire-resistance rating of the floor.

END OF SECTION 078443