SECTION 07 84 00

FIRESTOPPING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Firestopping materials.
2. Firestopping of all penetrations and interruptions to fire rated assemblies, whether indicated on Drawings or not, and other openings indicated.
3. [Fire barrier system.]
4. [Fire-rated electrical outlet and junction box pads.]

B. Related Sections:
1. Section 09 29 00 - Gypsum Board: Gypsum wallboard [fireproofing and non-fire-rated electrical outlet and junction box pads.]

1.02 REFERENCE STANDARDS

A. ASTM International
1. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
3. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
4. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.

B. Intertek Testing Services NA, Inc.:
1. ITS - Directory of Listed Products

C. South Coast Air Quality Management District:
1. SCAQMD Rule 1168 - Adhesive and Sealant Applications.

D. Underwriters Laboratories Inc.:
1. UL - Fire Resistive Directory.
2. UL 263 - Fire Tests of Building Construction and Materials.
3. UL 723 - Test for Surface Burning Characteristics of Building Materials.
4. UL 1479 - Fire Tests of Through-Penetration Firestops.

1.03 DEFINITIONS

A. Firestopping (Through-Penetration Protection System): Specific tested assemblies placed in spaces between penetrations through fire rated walls and floors to stop passage of fire, smoke, heat, and hot gases through fire rated construction.

1.04 SYSTEM DESCRIPTION

A. Firestopping Materials: ASTM E119, ASTM E814,] UL 263, and UL 1479 to achieve fire ratings of adjacent construction in accordance with Underwriters Laboratories or Intertek Testing Services - Warnock-Hersey Design Numbers noted on Drawings.

B. Through Penetration Firestopping of Fire Rated Assemblies: [UL 1479 or] ASTM E814 with

0.10 inch water gage minimum positive pressure differential to achieve fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.

1. Wall Penetrations: Fire F-Ratings as indicated on Drawings, but not less than 1-hour.
2. Floor [and Roof] Penetrations: Fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.
   a. Floor Penetrations within Wall Cavities: T-Rating is not required.

C. Through Penetration Firestopping of Non-Fire Rated Floor [and Roof] Assemblies: Materials to resist free passage of flame and products of combustion.
   1. Noncombustible Penetrating Items: Noncombustible materials for penetrating items connecting maximum of three stories.
   2. Penetrating Items: Materials approved by authorities having jurisdiction for penetrating items connecting maximum of two stories.

D. Fire Resistant Joints in Fire Rated Floor, Roof, and Wall Assemblies: ASTM E1966 or UL 2079 to achieve fire resistant rating as indicated on Drawings for assembly in which joint is installed.
   1. Smoke Barrier Joints Air Leakage: Maximum 5 cfm per foot at 0.30 inches water gage pressure differential.

E. Fire Resistant Joints Between Floor Slabs and Exterior Walls: ASTM E119 with 0.10-inch water gage minimum positive pressure differential to achieve fire resistant rating as indicated on Drawings for floor assembly.

F. Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84 or UL 723.

G. All firestopping assemblies shown on the Drawings and approved by the authority having jurisdiction represent one accepted assembly. Contractor may propose alternate assemblies for the acceptance by University's Representative. Contractor shall be responsible for obtaining the approval of the accepted assemblies by the authority having jurisdiction.

1.05 PERFORMANCE REQUIREMENTS

A. Conform to applicable code, Underwriters Laboratories, and Intertek Testing Services - Warnock-Hersey requirements for fire resistance ratings and surface burning characteristics.

B. Provide certificate of compliance from authority having jurisdiction indicating approval of materials used.

1.06 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate with plumbing, mechanical, electrical, sprinkler, and other trades to assure that all pipe, conduit, cable, and other items which penetrate fire-rated construction have been permanently installed prior to installation of firestopping.

B. [Preinstallation Meeting:]

C. [Sequencing:]

D. Scheduling:
   1. Do not cover installed firestopping until inspected by authority having jurisdiction.

1.07 [SUSTAINABLE CHARACTERISTICS]

A. Section 01 35 63 - Sustainability Project Requirements: Requirements for sustainable design compliance.

B. Materials and Resources Characteristics:
   1. [Recycled Content Materials: Furnish materials with maximum available recycled content including:

SPEC NOTE ***List materials specified in this section required to have recycled content.***

      a. [_____.]
   2. [Regional Materials: Furnish materials extracted, processed, and manufactured within 500 miles of Project site.]

SPEC NOTE ***List materials specified in this section required to be regional materials.***

      a. [_____.]

C. Indoor Environmental Quality Characteristics:
   1. [Interior] Sealants and Sealant Primers: Maximum volatile organic compound content in accordance with SCAQMD Rule 1168.

1.08 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.

B. Product Data: Submit data on product characteristics, uses, performance, test data, and limitation criteria for each type of firestopping material to be installed.

C. Schedule: Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.

D. Samples: Submit cured samples of firestopping sealant and caulking materials.

E. Shop Drawings: Show typical installation details fort the methods of installation. Indicate which firestopping materials will be used where and applications requirements to meet specific jobsite conditions.

F. Manufacturer's Installation Instructions: Submit preparation and installation instructions.

G. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

H. Engineering Judgments: For conditions not covered by Underwriters Laboratories or Intertek Testing Services - Warnock-Hersey listed designs, submit judgments by manufacturer suitable for presentation to authority having jurisdiction for acceptance as meeting code fire protection requirements.

I. Certificates: Upon completion of work, furnish written statement signed by Contractor, applicator, and manufacturer stating firestopping application complies with drawings, specifications, and manufacturer's recommendations and was proper and adequate for conditions requiring firestopping.

J. Contractor shall submit Underwriters Laboratories or Intertek Testing Services - Warnock-Hersey Design Number and detailed shop drawings of each type of firestopping assembly to be installed for approval by University’s Representative, [Office of Statewide Health Planning and Development,] and Campus Designated Fire Marshal.

1.09 [SUSTAINABLE DESIGN SUBMITTALS]

A. Section 01 35 63 - Sustainability Project Requirements: Requirements for sustainable design submittals.

B. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
   1. Materials Resources Certificates:
      a. Certify recycled material content for recycled content products.
      b. Certify source for regional materials and distance from Project site.
   2. Indoor Air Quality Certificates:
      a. Certify volatile organic compound content for each interior [adhesive] [and] [sealant] and related primer.
         1) Provide product data for adhesives, sealants, sealants primer and aerosol adhesives used in the interior of the building highlighting VOC content of each product used. Adhesives and sealants must meet or exceed the VOC limits of SCAQMD Rule #1168. Refer to the LEED 2009 for New Construction and Major Renovations for acceptable VOC limits
         2) Provide a listing of each indoor adhesive, sealant, sealant primer and aerosol adhesive product used in the interior of the project. Include manufacture’s name, product name, specific VOC data (g/L less water) for each product, and the corresponding allowable VOC from the referenced standard.

C. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements. Exclude cost of labor and equipment to install products.
   1. Provide cost data for the following products:
      a. Products with recycled material content.
      b. Regional products.

1.10 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs which provide the specified fire ratings when tested in accordance with methods indicated.
   1. Listing in the current-year classification or certification books of UL or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
   2. Current evaluation reports published by ICC will be considered as constituting an acceptable test report.
   3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.

1.11 MOCKUP

A. Apply one linear foot of each type of linear firestopping material to representative substrate surface.

B. Apply one of each unit type of firestopping material, such as penetrations through fire rated partition, to representative application.

C. Locate where directed by University’s Representative.

D. Incorporate accepted mockup as part of Work.

E. Remove mockup when directed by University’s Representative.

1.12 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver firestopping materials and related accessories in factory-sealed, unopened containers bearing manufacturer's name, batch number, product designation, and Underwriters Laboratories or Intertek Testing Services - Warnock-Hersey label.

B. Storage: Store materials in original, unopened containers or packages, off the ground and protected from environmental conditions. Follow manufacturer's recommendations for storage temperature and shelf life.

C. Handling: Follow manufacturer's recommendations for handling products containing toxic materials. Keep flammable material away from heat, sparks, and open flame. Use recommended solvents and cleaning agents for cleaning tools, equipment, and skin.

1.13 ENVIRONMENTAL REQUIREMENTS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions before, during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.

B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 FIRESTOPPING

A. General Requirements:
   1. Firestopping shall be compatible with contacting material.
   2. Firestopping shall not stain adjacent exposed surfaces.
   3. Firestopping material shall be free of asbestos.
   4. Firestopping material shall provide flame rating as noted for assembly being penetrated as tested in accordance with ASTM E814.

B. Manufacturers: Hilti Construction Chemicals, Inc.; Specified Technologies, Inc. (STI); 3M Fire Protection Products; RectorSeal Corp.; USG Corp.; or equal.

C. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.
   1. Silicone Firestopping Elastomeric Firestopping: Single or multiple component silicone elastomeric compound and compatible silicone sealant.
      a. Interior Sealants and Sealant Primers: Maximum volatile organic compound content in accordance with SCAQMD Rule 1168.
   2. Foam Firestopping Compounds: Single or multiple component foam compound.
   3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.
   4. Fiber Stuffing and Sealant Firestopping: Composite of mineral or ceramic fiber stuffing insulation with silicone elastomer for smoke stopping.
   5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
   6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.

7. Intumescent Sheet: Aluminum foil faced intumescent sheet with galvanized steel sheet backer.
8. Intumescent Wrap: Aluminum foil faced intumescent strips minimum 2 inches wide.
9. Firestop Pillows: Formed mineral fiber pillows.
10. Insulation: Rigid and mineral wool type insulations required for use in fire rated firestopping systems.

D. Telephone and Data Cable Penetrations: Use only materials that can be reused such as pillows or non-curing putty.

E. Color: Per manufacturer's standard colors.

2.02 [FIRE BARRIER SYSTEM]

A. [Fire Barrier System, Floor:]
1. Description: Flexible two-layer composite mat material with galvanized steel mounting angles on longitudinal edges, with 2-hour fire-rating for joint size up to 24 inches when tested in accordance with ASTM E119. The composite mat material shall be continuous over the full width of joints. Provide fire retardant insulation and firestopping sealant where recommended by manufacturer or required as part of fire-rated assembly.
2. Product: Construction Specialties, Inc.'s "Model FB-83W-2 Hr"; or equal.

B. [Fire Barrier System, Wall:]
1. Description: Flexible two-layer composite mat material with galvanized steel mounting angles on longitudinal edges, with 2-hour fire-rating for joint size up to 24 inches when tested in accordance with ASTM E119. The composite mat material shall be continuous over the full height of joints. Provide 3-1/2 inch thick nominal fiberglass insulation with nominal 0.6 pounds per cubic foot where shown.
2. Product: Construction Specialties, Inc.'s "Model FB-83W-2 Hr"; or equal.

2.03 [FIRE RATED ELECTRICAL OUTLET AND JUNCTION BOX PADS]

A. Description: Moldable putty pad, asbestos free, non-toxic, Underwriters Laboratories classified up to two hours when tested in accordance with ASTM E119.

B. Product: 3M Fire Protection Products' "Fire Barrier Moldable Putty, MPP-4S+"; Nelson Firestop Products' "Type FSP Firestop Putty Pads"; or equal.

2.04 ACCESSORIES

A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.

B. Dam Material: Non-combustible material as required.

C. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine [joints and] spaces to receive firestopping and verify that:

1. Surfaces are satisfactory for proper installation of firestopping.
2. Sprayed fireproofing work has been completed and cured properly.

B. Do not start application until unsatisfactory conditions have been corrected in a manner acceptable to University's Representative.

3.02 PREPARATION

A. Cleaning:
1. Thoroughly clean receiving surfaces, joints, and spaces of foreign material such as dirt, dust, mill-scale, rust, oil, grease, sealer, curing compound, paint, and other coatings.
2. Blow joints free of loose particles.
3. Use only cleaning materials recommended by firestopping manufacturer.

B. Verify proper surface and ambient temperatures.

C. Remove incompatible materials affecting bond.

D. Protect adjacent surfaces from damage during installation of firestopping materials. Mask where necessary to protect adjoining surfaces.

E. [Install [backing] [damming] materials to arrest liquid material leakage.]

F. Primers: Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.
1. Make preliminary tests to ensure primers will not stain exposed materials or deteriorate back-up material.
2. Prime surfaces as recommended by firestopping manufacturer immediately prior to sealing.

G. In all other respects, prepare surfaces in accordance with manufacturer's recommendations.

3.03 FIRESTOPPING

A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit, and other items, requiring firestopping.

B. Prepare and install firestopping in exact accordance with fire test reports, fire resistance requirements, and manufacturer's printed instructions and recommendations to provide fire rating of assembly being penetrated.

C. Install labeling required by code.

D. Apply firestopping material in sufficient thickness to achieve required rating of assembly being penetrated.

E. Install firestopping sealant and caulking with sufficient pressure to properly fill and seal openings.

F. Surface Depth: Provide full depth and width of spaces around penetration, and on each side of wall or partition construction for a depth in accordance with tested assembly.

G. Tooling:
1. Using tooling agent recommended by firestopping manufacturer, neatly tool joints to compress material, improve adhesion to surfaces joined, and achieve slightly concave

surface.
2. Repair air pockets exposed by tooling.
3. Use masking tape where required to facilitate tooling and remove upon completion.

H. [Remove dam material after firestopping material has cured unless otherwise recommended by firestopping manufacturer.]

I. Finish surfaces of firestopping, which is to remain exposed in the completed work to a uniform and level condition.

3.04 [FIRE BARRIER SYSTEM]

A. Install at seismic joint cover assemblies requiring fire rating in accordance with manufacturer's specifications.

B. Fire barriers are to be of sizes shown and are to accommodate the horizontal movement scheduled.

C. Movements may be in tension, compression, left shear, right shear, left hand rotation or right hand rotation, depending on the joint orientation.

3.05 [FIRE RATED ELECTRICAL OUTLET AND JUNCTION BOX PADS]

A. Mold outlet box pad carefully around box after box is securely attached to studs and before gypsum board is installed.

B. Take care to ensure that all openings are sealed with pad material.

C. At fire-rated partitions, install pad to maintain integrity of fire assembly and in accordance with manufacturer's specifications.

3.06 FIELD QUALITY CONTROL

A. Section 01 45 00 - Quality Control: Testing and Inspection Services.

B. All areas of work must be accessible until inspection by authority having jurisdiction.

C. Inspect installed firestopping for compliance with specifications and submitted schedule.

D. Manufacturer’s Representative: Conduct periodic inspections to ensure adherence to previously approved procedures.

E. Correct unacceptable firestopping installations and provide additional inspection to verify compliance with this specification at no additional cost.

3.07 PATCHING

A. Patch or replace defective or damaged work as directed by University’s Representative.

3.08 CLEANING

A. Clean adjacent surfaces soiled in applying firestopping in accordance with firestopping manufacturer's recommendations.

B. Remove spills, excess materials, and stains from adjacent surfaces before they have set.

C. Remove all debris and excess materials entirely from site and leave work in a neat and tidy condition.

3.09 PROTECTION OF INSTALLED CONSTRUCTION

A. Where firestopping is installed at locations, which will remain exposed in completed work, provide protection as necessary to prevent against damage from other construction activities.

END OF SECTION