SECTION 270550 - FIRESTOPPING FOR COMMUNICATIONS

PART 1 - GENERAL

1.1 SUBMITTALS

A. Product Data:

1. Bill of Materials (BOM).
2. Product Datasheets.
3. Material Safety Data Sheets (MSDS).

B. Closeout Submittal:

1. Product Datasheets.
2. Material Safety Data Sheets (MSDS).
3. Schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance ratings.

1.2 REFERENCES

A. Definitions:

1. Firestop: A fire-rated material, device, or assembly of parts installed in a penetration of a fire-rated barrier.
2. Firestop system: A specific construction consisting of the material(s) (firestop penetration seals) that fill the opening in the wall or floor assembly and any items that penetrate the wall or floor, such as cables, cable tray, conduit, ducts, pipes, and any termination devices, such as electrical outlet boxes, along with their means of support.
3. Firestopping: The process of installing listed, fire-rated materials into penetrations in fire-rated barriers to reestablish the fire-resistance rating of the barrier.
4. Intumescent firestop: A firestopping material that expands under the influence of heat.

B. Reference Standards:

1. ASTM E 84, “Surface Burning Characteristics of Building Materials.”
2. ASTEM E 119, “Fire Tests of Building Construction and Materials.”
3. ASTM E 814, “Fire Tests of Penetration Firestop Systems.”
4. ANSI/UL 263, “Fire Tests of Building Construction and Materials.”
5. ANSI/UL 723, “Surface Burning Characteristics of Building Materials.”
6. ANSI/UL 1479, “Fire Tests of Through Penetration Firestops.”
7. Underwriters Laboratories Inc. (UL) – Fire Resistance Directory.
8. National Fire Protection Association (NFPA) – NFPA 70: National Electrical Code.
9. National Fire Protection Association (NFPA) – NFPA 101: Life Safety Code.

10. TIA-569-B, Annex A, "Firestopping."
11. The most current published edition of the "Telecommunications Distribution Methods Manual (TDMM)" published by the Building Industry Consulting Services International (BICSI), "Firestopping."

1.3 QUALITY ASSURANCE

A. Where the local jurisdiction requires additional training, licensing, permits and certifications to perform firestopping, the entity and individuals performing the work shall comply with such requirements.

1.4 SYSTEM DESCRIPTION

A. All penetrations through floors, ceilings, and walls shall be sleeved. All sleeves through floors and walls shall be firestopped.

1. The firestopping system shall resist and limit the spread of fire, heat, smoke and gasses through otherwise unprotected openings in rated assemblies, including walls, partitions, floors, ceilings/roof and similar locations, restoring the integrity of the fire rated construction to its original fire rating, in accordance with applicable codes, standards, and as directed by the AHJ.
2. All sleeves into spaces containing pressurized fire suppression systems shall be self-sealing sleeve assemblies.

B. Firestopping requirements and locations are not specifically indicated on the Drawings. Review the architectural and other related Drawings to determine fire- and smoke-rated walls and floors, including minimum rating requirements. Provide firestopping Work associated with Division 27 and Division 28 (where applicable) per the requirements of the Contract Documents.

1. At a minimum, firestopping shall equal or exceed the rating of the wall or floor and with a minimum UL classification for 1-hour fire and cold side temperature ratings.
2. Firestopping systems shall be listed for the specific combination of fire-rated construction, type of penetrating item, annular space requirements, and fire rating, including the following criteria:

    a. F-Rating: Where applicable, provide products that meet the intent of the F-rating classification for passage of flame per ANSI/UL 1479 or ASTM E814 for through penetrations. Rating shall be equal to or greater than the fire-resistance rating of the assembly in which the firestopping will be installed.
    b. T-Rating: Where applicable, provide products that meet the intent of the T-rating classification for the transfer of temperature per ANSI/UL 1479 or ASTM E814 for through penetrations. In habitable areas where penetrating items are exposed to potential contact with materials on fire side(s) of rated assembly, T-rating must equal F-rating

c. L-Rating: Provide products that meet the intent of the L-rating classification for the movement of smoke per ANSI/UL 1479 or ASTM E814 for through penetrations.
d. W-Rating: Where applicable, provide products that meet the intent of the W-rating classification for passage of water per ANSI/UL 1479 or ASTM E814 for through penetrations. Shall meet UL Water Leakage Test, W-Rating – Class 1 requirements for systems tested and listed in accordance with ANSI/UL 1479 or ASTM E814.
e. Wall Penetrations: Through penetration systems shall be symmetrical, with the same rating from both sides of the wall.

3. Firestopping shall be installed within the interior cavity of conduit sleeves, raceway, cable tray and other cable conveyances where the interior volume of the conveyance is open and exposed in one space while the opposite end of the conveyance is open and exposed within another.
4. Firestopping shall be installed where preparations for, or installation of equipment (e.g., cabling, devices) cause the fire or smoke rating of a building component or assembly to be reduced as a result of some action taken.
5. Fire-resistive joint sealants: Provide joint sealants with fire-resistance ratings as determined per ASTM E 119, but not less than that equaling or exceeding the fire-resistance rating of the construction in which the joint occurs.
6. Firestopping products shall be compatible with each other, with the substrates forming openings, and with the items, if any, penetrating the firestopping, under the conditions represented by the Project, based on testing and field performance demonstrated by the firestopping products/system manufacturer.
7. Firestopping system and products exposed to view, traffic, moisture, and physical contact shall not deteriorate when exposed to these conditions.
8. Firestopping systems for floor penetrations with annular spaces exceeding 4 inches (100 mm) or more in width and exposed to possible loading and traffic shall be capable of supporting the floor loads involved by installing floor plates or by other means.

PART 2 - PRODUCTS

2.1 GENERAL

A. Products furnished of each Type shall be manufactured by a single manufacturer, bear the same brand name, be the same finish color and texture, and be from the same product model series, except where otherwise indicated.

2.2 MANUFACTURERS

A. To maintain control and integrity of the firestopping applications, utilize a single manufacturer. Specific UL or approved listing agencies systems applicable to each type of firestop condition shall be supplied by a single manufacturer.

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

1. Specified Technologies, Inc. (STI).
2. 3M Fire Protection Products (3M).
3. Hilti Corporation (Hilti).
4. Unique Fire Stop Products.
5. Nelson Firestop Products.
6. Unifrax Corporation.

2.3 MATERIALS

A. Firestopping products shall be tested and Listed for specific fire resistance rated construction conditions and shall conform to construction assembly type, penetrating item type, annular space requirements, and fire rating involved for each separate instance.

B. Component Types – Utilize as required to meet Project requirements

1. Intumescent sealants: Single component intumescent latex formulations containing no water soluble intumescent ingredients.

    a. Basis of Design shall be Specified Technologies Inc. (STI) SpecSeal Series SSS Intumescent Sealant and SpecSeal Series LCI Intumescent Sealant.

2. Endothermic sealants: Single component latex formulations that upon cure do not re-emulsify during exposure to moisture.

    a. Basis of Design: Specified Technologies Inc. (STI) SpecSeal Series LC Endothermic Sealant.

3. Firestop devices: Factory-assembled steel collars lined with intumescent material sized to fit specific outside diameter of penetrating item.

    a. Basis of Design: Specified Technologies Inc. (STI) SpecSeal Series SSC Firestop Collars and SpecSeal LCC Firestop Collars.

4. Wall opening protective materials: Intumescent, non-curing pads or inserts for protection of device boxes to reduce horizontal separation to less than 24 inches (610 mm).

    a. Basis of Design: Specified Technologies Inc. (STI) SpecSeal Series SSP Firestop Putty Pads or SpecSeal Series EP PowerShield Insert Pads.

5. Firestop putty: Intumescent, non-hardening, water resistant putties containing no solvents, inorganic fibers or silicone compounds.

    a. Basis of Design: Specified Technologies Inc. (STI) SpecSeal Series SSP Putty.

6. Intumescent wrap strips: Single component intumescent elastomeric strips faced on both sides.

    a. Basis of Design: Specified Technologies Inc. (STI) SpecSeal Series SSW Wrap Strip.

7. 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.

    a. Basis of Design: Specified Technologies Inc. (STI) SpecSeal Series SSB Pillows.

8. Mortar: Portland cement based dry-mix product formulated for mixing with water at Project site to form a non-shrinking, water-resistant, homogenous mortar:

    a. Basis of Design: Specified Technologies Inc. (STI) SpecSeal Series SSM Firestop Mortar.

9. Silicone sealants: Moisture curing, single component, silicone elastomeric sealant for horizontal surfaces (pourable or non-sag) or vertical surface (non-sag).

    a. Basis of Design: Specified Technologies Inc. (STI) SpecSeal SIL300 Silicone Firestop Sealant or SpecSeal SIL300 SL Self-Leveling Silicone Firestop Sealant.

10. Composite sheet: Intumescent material sandwiched between a galvanized steel sheet and steel wire mesh protected with aluminum foil:

    a. Basis of Design: Specified Technologies Inc. (STI) SpecSeal CS Composite Sheet.

11. Firestop plugs: Re-enterable, foam rubber plug impregnated with intumescent material for use in blank openings and cable sleeves.

    a. Basis of Design: Specified Technologies Inc. (STI) SpecSeal Series FP Firestop Plug.

12. Intumescent collar devices: Steel collar system with intumescent inserts.

    a. Basis of Design: Specified Technologies Inc. (STI) SpecSeal Series SSC and LCC.

13. Horizontal wall penetrations in Gypsum Board

    a. Fire-rated cable grommet: Molded two-piece grommet made from plenum grade polymer with a foam inner core for sealing individual or small, multi-cable bundle penetrations.

1) Basis of Design: Specified Technologies Inc. (STI) Ready Firestop Grommet.

C. Firestop sleeve assembly kit:

1. Sized to accommodate cable quantities indicated in the Contract Documents plus 20 -percent additional capacity for growth.
2. Includes steel escutcheon plates and intumescent firestop gaskets sized to fit the specific outside diameter of the sleeve and sandwich the barrier to lock the sleeve in place.
3. Includes sufficient thickness of intumescent firestop putty to seal the ends of the sleeve to restrict the passage of fire, smoke and superheated gases.

4. Basis of Design shall be Specified Technologies Inc. (STI) SpecSeal READY SLEEVE and SpecSeal READY SPLIT SLEEVE (for existing cable penetrations).

D. Accessories:

1. Provide components for each firestopping system required to install fill materials and to comply with the system performance requirements. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire-resistance-rated systems. Firestopping materials shall be asbestos-free and shall not contain flammable solvents. Accessories include but are not limited to the following:

a. Permanent forming, damming, backing materials, including the following:
1) Semi-refractory fiber (mineral wool) insulation.
2) Ceramic fiber.
3) Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
4) Fire-rated form-board.
5) Joint fillers for joint sealants.

b. Temporary forming materials.
c. Substrate primers.
d. Collars.
e. Steel sleeves.
f. Warning labels.

2.4 COMBUSTIBLES IN PLENUM SPACES

A. Passive combustibles installed within plenum spaces that are not UL listed for installation within plenum spaces shall be encased within high-temperature plenum insulation, the purpose of which is to prevent flame propagation and smoke development in the plenum areas. Passive combustibles include such items as non-plenum cables, pipe, low-voltage connector housings.

1. Plenum insulation shall be UL listed for the application.
2. Basis of Design: UniFrax FyreWrap 0.5.

PART 3 - EXECUTION

3.1 GENERAL

A. Consult and comply with the AHJ concerning local firestopping requirements.

1. Where no NRTL tested firestop application exists, manufacturer's engineering judgment derived from similar listed system designs or other tests shall be submitted to the AHJ for review and approval prior to installation.
2. It is the sole responsibility of the firestopping provider to install tested and approved systems that comply with applicable codes, standards and/or agencies and authorities having jurisdiction.

B. Comply with TIA-569-B, Annex A, "Firestopping."

C. Comply with the most current published edition of the "Telecommunications Distribution Methods Manual (TDMM)" published by the Building Industry Consulting Services International (BICSI), including the "Firestopping" article.

D. Through-penetration firestop systems and construction gap fire resistive systems shall be supplied and installed with approved methods using materials that have been tested and classified to produce a listed and approved assembly.

E. Provide products that upon curing do not re-emulsify, dissolve, leach, break down or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water or other forms of moisture characteristic during or after construction.

F. Openings within floors and walls designed to accommodate cabling shall be provided with re-enterable products that do not cure or dry.

G. Damaged or expired materials shall be removed from the site and shall not be used in the Work.

H. Do not use materials that contain flammable solvents.

I. Sleeves shall be mechanically fastened to the wall, floor, ceiling or roof assembly.

3.2 DELIVERY, STORAGE AND HANDLING

A. Deliver firestopping products to the Project site in original, unopened containers or packages with intact and legible manufacturer labels identifying product and manufacturer, date of manufacture, lot number, shelf life, if applicable, qualified testing and inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multi-component materials.

1. Coordinate the delivery date of firestopping materials with the scheduled date of installation to minimize the amount of storage time required at the Project site.
2. Store with a copy of the manufacturer MSDS sheet. Submit a copy of each sheet to the Owner's project manager upon delivery to the site.

B. Store and handle firestopping materials to prevent deterioration or damage due to moisture, temperature changes, contaminants or other causes. Handle, store and protect products and materials according to the manufacturer's printed recommendations and guidelines.

C. Do not deliver or install product(s) in conditions that jeopardize the performance of the product.

3.3 INSTALLATION

A. Install firestopping products in compliance with manufacturer's printed instructions, recommendations and technical information.

B. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to manufacturer's requirements. Coordinate sizing of sleeves, openings, core drilled holes or cut openings to accommodate through-penetration firestop systems.

C. Environmental conditions:

1. Install firestopping products when ambient or substrate temperatures are within the requirements recommended by the firestopping manufacturer. Do not install firestopping when ambient or substrate temperatures are outside the limits permitted by the manufacturer or when substrates are wet due to rain, frost, condensation or other causes.
2. Maintain temperatures and environmental conditions within limits recommended or required by manufacturer's printed instructions or technical information for any required periods of time before, during and after installation of materials.

D. Ventilation: Provide ventilation as required by firestopping manufacturer, including mechanical ventilation if required.

E. Examine substrates and conditions for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.

F. Surfaces shall be free of dirt, grease, oil, scale, laitance, rust, release agents, water repellants and any other substances that may inhibit optimum adhesion.

G. Clean openings and joints immediately before installation of firestopping to comply with firestopping manufacturer's printed guidelines and recommendations and the following requirements:

1. Remove foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping.
2. Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form-release agents from concrete.

H. Provide masking and temporary covering to protect adjacent surfaces and prevent contact with the following:

1. Adjoining surfaces that will remain exposed upon completion of the Work.
2. Surfaces that would otherwise be permanently stained or damaged by such contact or cleaning methods used to remove smears from firestopping materials.
3. Remove masking and temporary covering as soon as possible to do so without disturbing firestopping seal with substrates.

I. Install fire stop materials, including forming, packing, and other accessory materials, to fill openings around services penetrating floors, walls, ceilings and roofs, to provide fire-resistance ratings indicated for the assembly in which the penetration occurs. Comply with installation requirements established by the manufacturer and testing and inspecting agency.

J. Install forming/damming materials and other accessories of types required to support fill materials during application and in the position needed to produce the cross-sectional shapes and depths required to achieve fire ratings of designated firestop systems. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

K. Install fill materials for through-penetration firestop systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.

L. Seal between sleeves and pipes and other through-penetration pathway devices with firestop material. Material shall meet applicable fire ratings required.

M. Firestop systems shall not hamper the performance of fire dampers in ductwork or other safety systems.

N. Tool non-sag sealants immediately after sealant application and before skinning or curing begins. Form smooth, uniform beads of configuration required to produce fire-resistance rating, as well as to eliminate air pockets, and to ensure contact and adhesion of sealants with sides of joint. Remove excess sealant from surfaces adjacent to the joint. Do not use tooling agents that discolor sealants or adjacent surfaces or that are not approved by the sealant manufacturer.

O. Firestopping for discrete cable pathways (J-hooks):

1. Discrete cable pathways shall terminate at each barrier and resume on the opposite side such that cables pass independently through fire-rated pathway devices.

3.4 FIELD QUALITY CONTROL

A. Components used in firestop systems shall be the same as the products used in fire qualification tests, must be prepared and installed using established quality control procedures, and verified periodically by an independent quality auditor at the manufacturer's facility. The final field installation shall be reviewed and validated by the AHJ.

B. Do not enclose firestopping with other construction until examinations are completed. Area of Work shall be accessible until inspections are completed by the AHJ.

C. Where deficiencies are found, repair or replace firestopping at no additional expense to the Owner so that Work complies with requirements.

3.5 CLEANING

A. Clean all surfaces adjacent to sealed openings to be free of excess firestopping materials and soiling as work progresses.

B. Remove excess fill materials and sealants adjacent to openings and joints as Work progresses. Use methods and cleaning materials approved by manufacturers of firestopping products and products in which openings and joints occur. Return surfaces to the original condition.

C. During and after the curing period, protect firestopping from contact with contaminating substances and from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion.

1. If damage or deterioration occurs, remove damaged or deteriorated firestopping immediately, and install new materials to produce firestopping complying with specified requirements.

END OF SECTION 270550