SECTION 16060 - FIRESTOPPING FOR ELECTRICAL PENETRATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

The Drawings, general provisions of the Contract and the requirements of Section 16050 apply to the Work specified in this Section.

1.2 SUMMARY:

A. Provide through-penetration firestop systems to maintain an effective barrier against the spread of flame, smoke, hot gases and water through openings made in fire-rated walls or floors to accommodate electrical through-penetrating items such as conduit, busway, cables and cable tray. Firestop shall provide necessary Fire (F) and Temperature (T) ratings. Firestop shall be waterproof and cold-smokeproof. Firestop shall be waterproof and cold-smokeproof.

B. Provide necessary protection of openings in rated floor-ceiling and roof-ceiling assemblies for luminaires and other electrical penetrations.

C. Install protective materials on electrical outlet boxes when openings in fire-resistive walls or partitions exceed openings allowed by building code.

1.3 SYSTEM DESCRIPTION:

A. Floor and Walls: The following locations within the building require the installation of a firestop system with appropriate F and T ratings for the penetrated barrier.

1. All conduit, cable, wiring, cable tray or similar through-penetrations of fire-rated walls.
2. All conduit, cable, wiring, cable tray or similar through-penetrations of floors above grade.

B. Ceilings: Enclosures and other assemblies fabricated to protect openings for electrical apparatus installed in a rated ceiling shall be a design classified by Underwriters Laboratories or other approved testing lab.

C. Membrane Penetrations: Fire-resistive walls and partitions may have openings for steel electrical outlet boxes in accordance with the building code. When total area of penetrations, spacing or other allowable criteria are exceeded, firestop each penetration with UL-classified wall opening protective material.

D. Ratings: The Contractor shall verify the fire rating of all walls, floors and ceiling assemblies having electrical penetrations by reviewing appropriate Architectural and Structural drawings and specifications. Certain firestop systems may be identified on the Electrical drawings.
E. Smoke-Stop: Floor and wall firestop shall prevent the passage of cold smoke, either as an inherent property of the system, or by the use of a separate product designed as a smoke-stop and included as part of the UL listed system or device. Blocking cold smoke shall not require activation of intumescent or other heat-activated properties of the firestop.

F. Waterproof: Firestops installed in floors shall be waterproof to prevent passage of water by gravity flow through penetration from upper floor surface.

1.4 QUALITY ASSURANCE:

A. General: All through-penetration firestop systems shall be installed per firestop manufacturer’s written recommendations using materials that have been tested and classified by an independent lab.

B. Local Codes: Comply with requirements of the local authority having jurisdiction.

C. Letter of Certification: A letter of certification written by the installing Contractor that states the system is properly installed as recommended by the manufacturer and as described in this specification shall be submitted to the Architect.

D. Single Source: All fire barrier products, exclusive of hydraulic cements and mortars, shall be from a single manufacturer.

E. For those firestop applications for which no UL-tested system is available, a manufacturer’s engineering judgement derived from similar UL system designs or other test shall be submitted to local authority having jurisdiction for review and approval prior to installation. Engineering judgement drawings shall comply with criteria of the International Firestop Council (IFC), September 7, 1994 or later edition.

1.5 SUBMITTALS:

A. Provide submittals according to Section 16050.

B. Firestop Systems: Submit manufacturer specifications and technical data for each material including the composition and limitations, documentation of UL firestop system (certifying F rating and T rating), and manufacturer installation instructions.

C. Manufacturer's Engineering Judgements: Submit an IFC standard engineering judgement identification number and drawing details when no UL System is available for an application. Engineering judgement shall include the specific Project Name and the name of the Contractor that will install the firestop system depicted.

D. Material Safety Data Sheet (MSDS): Submit a OSHA standard MSDS for each product proposed to be installed.
E. Sign: Submit a sample of sign to illustrate complete text message. Refer to paragraph Field Quality Control for sign requirements.

F. Installer: Submit installer's credentials to prove qualifications.

1.6 DELIVERY AND HANDLING:

A. General: Follow manufacturer's recommended methods for product handling.

B. Delivery: Deliver materials to the site in original sealed containers fully identified with manufacturer's name, brand, type, grade and U.L. labels. Packaging is necessary to assist job-site verification of Contractor's compliance with firestop specifications. The firestop systems shall be ready to install and require no critical job site mixing procedures or precise installation time constraints.

C. Minimize storage time of firestop materials at job-site. Coordinate delivery of materials with scheduled installation date.

D. Store materials under cover, protect from weather and hold within temperature limitations as recommended by firestop manufacturer.

E. Comply with recommended procedures, precautions or remedies described in material safety data sheets for firestop products.

F. Firestop installations shall use only undamaged and unexpired materials.

1.7 SEQUENCING:

A. Trades Work: Schedule installation of cast-in-place firestop devices after completion of floor formwork, metal form deck, or composite deck but before placement of concrete. Coordinate sequence of work to maintain sufficient access to all penetrations to allow proper working clearances for installation of firestop systems. Electrical risers and other penetrants that may become blocked off by work of other trades (e.g. conduits blocked by partitions, HVAC ductwork, etc.) shall have all penetrations sealed prior to obstruction by other trades.

B. Re-entry: Firestop shall not be applied until after installation of electrical system equipment, conductors or components in the through-penetration of a fire-rated wall or floor. If re-entry is required, the firestop system shall be replaced or restored to the fire rating of the penetrated assembly.

C. Building Official: Firestopping shall not be concealed until inspected by the Building Official.

PART 2 - PRODUCTS

2.1 FIRESTOP MATERIALS:

A. Intumescent: Product shall be an intumescent, elastomeric, one-part firestop
compound, intumescent fire barrier partition panel system (for larger openings),
intumescent fire barrier wrap strip, intumescent fire barrier composite sheet or
intumescent, non-curing re-penetrable block.

B. Mortar: Mortar shall be light-weight, cement-based product designed to seal
through-penetrations.

C. Content: All firestop materials shall be halogen-free. Firestop product shall not
contain any asbestos. Exposure level to solvent for out-gassing during curing
shall not exceed OSHA adopted Permissible Exposure Level (PEL) for any
component chemical.

D. Tack Free Time: The firestop compound shall be dry to the touch (tack free
surface) within 2 hours after installation and shall be functional as a firestop
immediately after installation.

E. Smoke and Water Seal: Firestop system shall provide cold smoke seal in floor or
wall penetration before, during and after exposure to fire or heat. Similarly,
firestop shall provide water seal in floor penetrations.

F. Compatibility: Under normal environmental conditions the material shall be
non-corrosive to metal and compatible with synthetic cable jackets.

G. Curing: The firestop material shall not substantially shrink after curing so as to
allow voids or through openings to form and shall not separate from the
penetrant or opening.

H. Pliable: The firestop material shall be sufficiently flexible and pliable after curing
so as to allow for normal expansion and contraction of the building assemblies
and the penetrating objects without cracking, becoming displaced or allowing
voids or through openings to occur.

2.2 THROUGH-PENETRATION FIRESTOP:

A. Fire (F) Rating: Through-penetration firestop system shall have been tested and
verified to provide a F rating equal to, or greater than, the building construction
assembly through which the penetration occurs.

B. Temperature (T) Rating:

1. Through-penetration firestops shall have a T-rating at through-penetration
locations required to have T ratings by 2000 International Building Code
(IBC) 711.4.1.2. T-rating shall not be less than the required fire-
resistance rating of the assembly penetrated.

2. Penetrations through fire-resistive floors shall be protected with a
through-penetration fire stops installed to provide a T-rating. Exception:
The T-rating shall not apply to floor penetrations that contained within the
cavity of a wall.

C. Materials:
1. Cast-in place firestop devices shall be installed before concrete placement for use with non-combustible raceway or electrical cable bundles that penetrate concrete floors.
   a. Hilti CP 680 Cast-In-Place Firestop Device
   b. Fire barrier sleeve shall be 3M™ Fire Barrier Cast-In Device Series plus 3M Height and/or Metal Deck Adaptors as required, or approved equal.
   c. Accepted equivalent products that are listed in UL Fire Resistance Directory, Vol. 2.

2. Sealants, foams or caulking materials for use with non-combustible items, including rigid steel conduit and electrical metallic tubing (EMT).
   a. Hilti FS-ONE Intumescent Firestop Sealant
   b. Hilti CP 620 Fire Foam
   c. 3M Fire Barrier Caulk #CP-25+ (halogen-free formula)
   d. Specified Technologies, Inc SpecSeal Sealant

3. Intumescent sealants, foam or caulking materials for use with flexible cable or cable bundles.
   a. Hilti FS-ONE Intumescent Firestop Sealant
   b. Hilti CP 168 Firestop Putty Stick
   c. Hilti CP 620 Fire Foam
   d. 3M Fire Barrier Caulk #CP-25+ (halogen-free formula)
   e. Specified Technologies, Inc. SpecSeal Sealant

4. Non-curing (means that it remains soft), re-penetrable intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles.
   a. Hilti CP 168 Firestop Putty Stick
   b. 3M Fire Barrier Moldable Putty #MP-S (Stix)
   c. Specified Technologies, Inc. SpecSeal Firestop Putty

5. Wall opening protective materials for use with UL listed metallic outlet boxes.
   a. Hilti CP 168 Firestop Putty Pad
   b. 3M Fire Barrier Moldable Putty #MPP-4S+
   c. Specified Technologies, Inc. SpecSeal Firestop Putty pads
   d. Flamesafe brand of Grace Construction Products Flamesafe FSP 1077 Putty Pads
   e. Lowry’s Outlet Box Pads.

   a. Hilti Trowelable Firestop Compound
   b. Hilti FS 657 Fire Block
   c. Hilti CP 620 Fire Foam
   d. 3M Fire Barrier #CS-195 Composite Sheet and #FS-95+ Wrap Strip
   e. Specified Technologies, Inc. SpecSeal Wrapstrip

7. Non-curing, re-penetrable materials used for large or complex penetrations made for cable trays, multiple steel raceways and other openings for which future access is desired.
   a. Hilti FS 657 Fire Block
   b. 3M Fire Pillow
c. Flamesafe brand of Grace Construction Products, KBS Sealbags, Flamesafe Bags, and Flamesafe Pillows.

8. Specified Technologies, Inc. EZ-Path™ Cable Pathway. Two-hour fire-rated pathway for wire and cable to penetrate fire rated walls.

2.3 NON-COMBUSTIBLE PENETRANTS:

A. General: Annular space filler may be provided for non-combustible penetrants in lieu of a through-penetration system. Non-combustible electrical penetrants are defined for this specification as steel rigid conduit, IMC and EMT. Aluminum raceway, cables, and cable tray are excluded from this definition.

B. Firestop: Firestop shall have F-rating not less than the required fire-resistance rating of the assembly penetrated.

C. Assembly: Electrical conduits may penetrate singly or in groups. For conduits grouped in a single opening, maximum opening size shall be 144 square inches per 100 square feet. Largest conduit shall be 6-inch nominal diameter.

D. Annular Space Fillers:

1. General: The following types of annular space filler may be applied in firestopping non-combustible electrical penetrations.

2. 3M, Flamesafe, Hilti and Specified Technology fire protection products named for through-penetration firestop systems.

3. Hydraulic Cement: Shall be similar to Thorite brand of Thoro Systems Productions, Miami, Florida. Install to equal thickness of concrete or masonry wall/floor.

4. Mortar: Flamesafe brand of Grace Construction Products Mortar Seal, Hilti Trowelable Firestop Compound or SpecSeal Mortar by Specified Technologies, Inc. Install to equal thickness of concrete or masonry wall/floor.

5. Mineral Wool: Not allowed by itself as the only firestop material. Where used, mineral wool shall be a component of a UL listed system.

PART 3 - EXECUTION

3.1 GENERAL:

Provide all materials and work required for firestop systems for every electrical penetration of fire-rated walls, floors and ceilings.

3.2 VERIFICATION OF CONDITIONS:

Comply with the U.L. listing and classification requirements, the fire test report information for each firestop system and the product manufacturer's printed instructions and diagrams for installation. Installer shall be responsible for verifying suitability of any application not specifically covered by manufacturer's literature prior to installing material in such openings.
3.3 PREPARATION:

A. Protection: All surfaces to which the fire stopping compound will be applied shall be thoroughly cleaned of oil, grease, dirt, loose paint, mill scale or any other matter which would impair bonding. Provide hangers and damming materials as necessary.

B. Ventilation: Installation of all firestop products and systems shall be made under proper conditions and with adequate ventilation. Provide forced-air ventilation if recommended by the manufacturer.

3.4 APPLICATION:

Apply the firestop compound in the thicknesses required to comply with the fire-resistance ratings indicated. Provide additional compound if necessary to make cold-smoke seal and watertight barrier.

3.5 FIELD QUALITY CONTROL:

A. Identification: Provide a sign on each side of every penetration firestop. Printed adhesive labels from the firestop material manufacturer fulfill this requirement.

B. Text: "WARNING. This opening has been sealed with X-Brand Fire Barrier. DO NOT DISTURB! To maintain firestop after re-entry, reseal with X-Brand Fire Barrier products ONLY!", or similar approved text.

C. MSDS: Follow safety procedures recommended in the MSDS during installation and cleaning.

D. Level: Finish surface(s) of firestopping which is to remain exposed in the completed work to a uniform and level condition.

3.6 PROTECTION:

Protect other surfaces and equipment from being damaged by the application of firestop compound.

3.7 CLEANING:

A. Clean surfaces where firestop materials will be applied so they are free of dirt, grease, oil, rust, coring residue, release agents, water repellants and any other substance that would affect proper adhesion of firestop.

B. Properly and thoroughly remove excess and spillage and clean all surfaces. Remove all materials and equipment from the premises and building, and leave the work in a clean and satisfactory condition.
END OF SECTION 16060