SECTION 078400 FIRESTOPPING

PART 1- GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Firestop devices and systems tested in accordance with ASTM E814 (ANSI/UL 1479) and listed in UL Fire Resistance Directory.
   2. Fire resistant construction joints.
   3. Dynamic partition head, wall, barrier details.
   4. Fire safing at edge of slab and curtain wall conditions.
   5. Penetrations through fire-rated floors, walls, and shafts.
   6. Duct and damper firestops.
   7. Intumescent wraps and pads at receptacle boxes and recessed items within fire rated walls.

B. This Project is a registered US Green Building Council “LEED” project.
   1. Select adhesives and sealants meeting LEED requirements.
   2. Select materials to maximize use of recycled materials.
   3. Select locally or regionally fabricated products wherever possible.

C. Select adhesives, primers and sealants meeting Cal-GREEN requirements.

D. Related Sections:
   1. Section 000113 – Finish and Materials Legend, Designation
   2. Section 016010 – LEED v4 Product Requirements
   3. Section 016116 - Volatile Organic Compound (VOC) Restrictions
   4. Section 018113 – Sustainable Design Requirements
   5. Section 017329 - Cutting and Patching; Repair of openings with original materials.
   7. Section 072700 – Air Barriers
   8. Section 075419 – Polyvinyl Chloride Roofing: Roof Insulation.
   10. Section 07123 - Intumescent Fireproofing.
   12. Section 092900 - Gypsum Board
   15. Division 23 – Heating, Ventilating, and Air Conditioning.

1.2 REFERENCES


B. Test Requirements: UL 1479, “Fire Tests of Through-Penetration Firestops”


D. Underwriters Laboratories (UL) of Northbrook, IL publishes tested systems in their "FIRE RESISTANCE DIRECTORY" that is updated annually.

   1. UL Fire Resistance Directory:
      a. Firestop Devices (XHJI)
      b. Fire Resistance Ratings (BXRH)
      c. Through-Penetration Firestop Systems (XHEZ)
      d. Fill, Voids, or Cavity Material (XHHW)
1.3 SYSTEM DESCRIPTION

A. General: Make firestop and smoke seal assembly selections that comply with UL Fire Resistance Directory, authority having jurisdiction, and applicable codes for:
1. Materials, fabrication, and installation of firestops and smoke seals.
2. Fire containment.
3. Fire resistant construction joints.
4. Dynamic partition head details.
5. Edge of slab and curtain wall conditions.
6. Penetrations through fire-rated floors, walls, and shafts.
7. Duct and damper firestops.
8. Intumescent wraps and pads at receptacle boxes and recessed items within fire rated walls.
9. Coordinate with mechanical, electrical and drywaller to provide single manufacturer for all firestop materials.

B. Firestop Voids and Openings in Following Locations:
1. Duct, cable, cable tray, conduit, piping, and other penetrations through floor slabs (except on-grade slabs) and through fire rated walls and partitions.
2. Penetrations of vertical shafts, pipe chases, elevator shafts, and utility shafts.
3. Openings between floor slab edges and exterior walls, including glass and aluminum curtain walls.
4. Openings, gaps, and cracks at abutting fire rated assemblies and components, such as wall-to-wall and wall-to-floor including overhead floor and roof decks.
5. Blank openings into or through fire rated floors and walls.
6. Other locations indicated or scheduled.

C. Design Requirements:
1. Insulated Piping and Duct Penetrations: Install firestop systems intended for use with
FIRESTOPPING

1. Type of insulation on penetrating item.
   a. Install firestop systems intended for use with type of insulation on penetrating item.
   b. If compatible firestop system is unavailable, remove insulation at contact area with
      firestop material
   c. Coordinate with trades who installed insulation to ensure proper re-sealing of cut
      edges of insulation.

2. Provide Products that Do Not Deteriorate when Exposed to Following Conditions:
   a. Plumbing and Wet-Pipe Sprinkler Systems: Moisture-resistant through-penetration
      firestop.
   b. Exposed to View:
      1) Flame-spread value of less than 25 and smoke-developed value of less than
         450, ASTM E84.
      2) Compatible with applied finishes.

D. F and T Rating Requirements: Conform to F and T ratings, ASTM E 814 (ANSI/UL 1479).
   1. Comply with applicable codes and authority having jurisdiction.
   2. F Ratings: Equal to fire resistance rating of assembly being penetrated but not less than
      one hour.
   3. T Ratings: Equal to F ratings, except where a T rating for the firestop condition is
      specifically exempted by the applicable code.

E. Provide W-rated fire/smoke stop system (Class 1) for wet areas.

F. Testing Requirements:
   1. Utilize systems and materials tested and approved by UL or other nationally recognized
      independent testing agency acceptable to authorities having jurisdiction.
   2. Determine fire ratings in accordance with ASTM E814 (ANSI/UL 1479), ASTM E 1966
      (ANSI/UL 2079), and ASTM E 2307 for through penetration and joint firestops, ASTM E119
      (UL263) for fire rated assemblies, and as required by applicable codes and authority having
      jurisdiction.

G. Large openings may be closed with same type construction as adjacent floor, roof, and wall
   assembly.

H. Sealing around penetrations fire rated assemblies without approved firestop system is not
   permitted. Methods and materials not permitted include but are not limited to:
   1. Joint compound at gypsum board assemblies.
   2. Mortar at masonry and concrete assemblies.
   3. Use of joint sealants.

I. Whenever finished firestop materials are scheduled to receive finish paint or other coatings, test
   compatibility of firestop materials with coatings to be applied.

1.4 SUBMITTALS

A. General: Submit in accordance with Section 013300.

B. Submit manufacturer’s certification stating:
   1. Each penetration of fire rated walls and floor, partition heads, and edge of slabs will be
      firestopped with a firestopping system tested by UL or other recognized testing agency for
      substrate and penetrating item.
   2. Authorities having jurisdiction have approved firestopping systems for this project.
   3. Products and Classifications Schedule:
      a. Provide tabular form schedule for firestops, fire containment, and fire resistant
         construction joints.
      b. Schedule to identify:
         1) Construction penetrated including fire resistance rating.
         2) Penetrating item.
         3) Products and manufacturers included in each system.
         4) Form material used.
         5) Firestop classification and description from UL or other nationally recognized
            independent testing agency acceptable to authority having jurisdiction.
         6) Fire containment and fire resistant construction joint description.
7) F, T, and W ratings where applicable
   c. Update schedule periodically to include addition and changes.

C. Informational Submittals: Submit following:
   1. Test Reports: Copy of UL or other acceptable testing agency report illustrating each
      system and device as tested and approved.
   2. List of generic descriptions and product names and manufacturers included in each system
      including form material, containment system, gang assemblies, means of controlling size
      of annular space, and sealer, topcoat, or intumescent materials.
   3. Certifications specified in this section.
   4. Qualification Data: Manufacturer's and installer's qualification data.
   5. Manufacturer's field reports.

D. LEED Data: Refer to Section 018113 - Sustainable Design Requirements for submittal
   requirements to achieve overall LEED v4.0 goals.
   1. Credit MR 4, Recycled Content: The recycled content (by weight) of the major
      components shall be identified and documented.
   2. Credit MR 5, Regional Materials: The manufacturing locations and origin of raw and
      salvaged materials shall be identified and documented if sourced within a straight-line
      500 mile total travel distance of the project site using a weighted average determined
      through the following formula: (Distance by rail/3) + (Distance by inland waterway/2) +
      (Distance by sea/15) + (Distance by all other means) = 500 miles
   3. Credit IEQ 4.1, Low-Emitting Materials, Adhesives and Sealants: All field-applied
      adhesives and sealants used on the interior of the building shall meet the volatile organic
      compound (VOC) and chemical component limitations as defined in Section 01 81 13
      "Sustainable Design Requirements". VOC contents shall be identified and documented.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this
   Section with minimum five years experience.

B. Firestop Manufacturer: Do not use firestop material produced by any manufacturer who will not
   agree to send a direct employee as a qualified technical representative to the project site,
   during the initial installation and when requested, for the purpose of training appropriate installer
   personnel in proper selection and installation procedures and for rendering advice concerning
   the proper installation of materials.

C. Engineered Judgements: Engineering Judgments shall not be permitted without approval, prior
   to permit issuance for scope of work. An Alternate Materials and Methods Request (AMMR) will
   be required if a listed design is not available for a specific condition.

D. Installer Qualifications:
   1. Coordinate with mechanical, electrical, and drywaller to provide single company for
      installation for all firestopping materials
   2. Company specializing in installation of firestopping specified with experience on at least
      five projects of similar nature in past three years.
   3. Trained and approved by manufacturer of firestop materials.
   4. Engage 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 (not by distributor) as having been provided the necessary
      training to install firestop products per specified requirements.
   5. Pre-form Firestop Devices: Alternative to FM4991 and UL Certification, Furnish
      manufacturer installer training (not by distributor) for installation of Preformed Firestop
      Devices.
   6. The certified installer shall have in such person's possession a certification card available
      at all times during installation and inspection. Any new certified installer shall be submitted
      for review and approval.

E. Installer Responsibility: Select firestop, fire containment, and fire resistant construction joint
   products from those indicated for each penetration.
1. Obtain approval of authorities having jurisdiction for selected methods.
2. Submit proposed methods along with proof of acceptance by authority having jurisdiction.

F. Regulatory Requirements: Ensure firestop, fire containment, and construction joint components comply with applicable portions of local, state, and federal codes, laws, and ordinances for flame spread and smoke developed indices.

G. Certifications:
1. Contractor's and installer's certification that products are installed in accordance with Contract Documents, based on inspection and testing specified as part of Field Quality Control.
2. Manufacturer certification ensuring firestopping interface compatibility with other firestopping and systems
3. Certificates of compliance from authority having jurisdiction indicating approval of firestops, fire containments, and construction joints.

1.6 PRE-INSTALLATION CONFERENCE
A. Conduct pre-installation conference in accordance with Section 013119.
B. Agenda: Include discussion and agreement upon acceptable:
1. Product and classification schedule.
2. Test firestop materials to confirm compatibility with adjacent materials and chemicals and solvents with which they may come into contact during construction.
3. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration fire stop systems. Coordinate construction and sizing of joints to ensure that fire-resistive joint systems are installed according to specified requirements.
4. Coordinate fire stopping with other trades so that obstructions are not placed in the way prior to the installation of the fire stop systems.
5. Do not cover up through-penetration fire stop and joint system installations that will become concealed behind other construction until each installation has been examined by the building inspector.
6. Coordinate with firestop manufacturer during pre-installation conference to ensure installation is completed per the required design.

1.7 DELIVERY, STORAGE, AND HANDLING
A. Comply with Section 016000.
1. Packing, Shipping, Handling, and Unloading: Deliver materials in manufacturer's unopened containers with manufacturers name, product identification, lot number, UL labels or labels of other nationally recognized independent testing agency, and mixing and installation instructions.
2. Storage and Protection: Store materials to prevent deterioration and damage due to moisture, temperature change, and contamination.

1.8 PROJECT CONDITIONS
A. Environmental Requirements:
1. Comply with manufacturer's temperature and humidity limitations before, during, and after installation.
2. Do not install firestopping products when ambient or substrate temperatures are outside limitations recommended by manufacturer.
3. Do not install firestopping products when substrates are wet due to rain, frost, condensation, or other causes.
4. Comply with ventilation requirements.

2.0 SEQUENCING
B. Sequence Work properly with adjacent work to allow unobstructed access to all areas needing firestops and smoke seals.
1. Identify penetrations and openings requiring firestops, smoke seals, fire containments, and
construction joints.

2. Schedule installation of firestopping after completion of work involving penetrating items, but prior to covering, concealing, and eliminating access to penetrations.

3. Coordinate with work of other trades

C. Inspection: Request inspection of firestops by authority having jurisdiction and testing consultant before concealment.

1. Sequence work to permit installation to be inspected and approved prior to being concealed.

2. Ensure that subsequent openings and penetrations are reported, properly firestopped, and inspected.

PART 2- PRODUCTS

2.1 FIRESTOPPING DEVICE AND SYSTEM MANUFACTURERS

A. Acceptable Manufacturers:

1. **Basis of Design: Hilti Corp., Tulsa, OK.**

2. Specified Technologies Inc., Sommerville, NJ.

3. 3M Fire Protection Products, St. Paul, MN

B. Substitutions: Product substitutions must comply with Section 012500. Approval must be obtained by Cal Poly Facilities Planning and Capital Projects department and authority having jurisdiction for approved equivalent prior to installation.

2.2 PRODUCT DESCRIPTION

A.

1. Intumescent sealants: intumescent, water-based sealant. Fast drying, paintable, red in color. Sealant materials for use with non-combustible and combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe. Provides a W-rating once cured

2. Acrylic Based Firestop Sealants: Single part, water based. Paintable, low shrinkage, low VOC sealant. Use to firestop pipe penetrations (not for use with CPVC) and joints. Available in red, white and grey color.

3. Silicone Sealants: Flexible, Smoke, fume water and UV resistant sealant. Halogen and solvent free. Meets Class 1 W-rating requirements. Use in mechanical, electrical and plumbing applications to firestop through fire rated wall and floor assemblies


5. Intumescent Composite Sheets: Intumescent sheet that fastens directly to the surface, #304 stainless steel, and nonmagnetic. For use with large wall and floor fire-rated assemblies.

6. Intumescent Collar: Factory-assembled steel collars lined with intumescent material sized to fit specific outside diameter of penetrating item, latch mechanism for closing, BS and UL compliant, and FM approved firestop collar.

7. Intumescent Wrap Strips: Firestop wrap device that attaches to assembly around combustible plastic pipe (closed and open piping systems) and can be continuously wrapped.
8. Intumescent Firestop Blocks: Intumescent, re-usable, Re-enterable non-hardening blocks with an embedded fiberglass mesh used for large openings and complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways. To be installed with manufacturers label intact on block for ease of installation.


   a. Metal Deck Device: Cast-in firestop device that can work in composite W3 and W2 floor decks, does not require steel deck reinforcement or additional shoring and tested in accordance with UL 1479, ASTM E 814 and ASTM G21.

11. Plugs: For blank openings made in fire-rated wall or floor assemblies, where future penetration of pipes, conduits, or cables is expected.

12. Cable pathway devices: whenever single and/or bundled low-voltage cables penetrate fire rated concrete, masonry and drywall walls and floors, where frequent cable additions and changes may occur. The fire-rated cable management device shall contain integrated intumescent firestop wrap strip materials sufficient to maintain the hourly rating of the barrier being penetrated. The device shall be capable of being easily ganged together. The fire-rated cable management device shall consist of a bare metal housing and frame(s) to enable grounding for electrical continuity. The device shall provide airflow containment sufficient to achieve the L-Rating requirements of the barrier type.
   a. Round fire-rated cable management device: The device shall consist of a corrugated steel tube with zinc coating, contain and inner plastic housing, intumescent material rings, and inner fabric smoke seal membrane. The device shall contain a smoke seal fabric membrane or intumescent firestop sufficient to achieve the L-Rating. Install device per the manufacturer's published installation instructions.
   b. Rectangular fire-rated cable management device: The device shall consist of a rectangular galvanized steel sleeve with a symmetrical half-shell design for retrofit capabilities. The device shall consist of an inner and outer layer of brushes on both ends of the device sufficient to achieve the L-Rating. The device shall be capable of being easily ganged together using gang plate or floor grid systems with ganging clips. Install device per the manufacturer’s published installation instructions.

13. Pre-formed Head of Wall Device: One-piece, pre-formed, polyurethane foam based, firestop seal for use with standard head-joint top tracks and slip-type head joints in fire-rated construction at top of partition to maintain continuity of the fire-resistance-rated assembly indicated. Provide in width and configuration required to accommodate depth and installation of studs and designed to saddle-over the top track.

14. Firestop Joint Spray: Tested in accordance with ASTM D6904, both sprayable and brushable, contains no halogens, solvents, or asbestos, mold and mildew resistance rating of 1. For use of sealing wall and top-of-wall openings and joints, building perimeter gaps between floor slabs and exterior façades.

15. Edge of Slab Device: Pre-formed polyurethane foam based material for use as part of a perimeter fire barrier between fire resistance rated floors and exterior wall assemblies.
B. Performance Criteria:
1. Provide 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. 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.

3. 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.

4. 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. Systems: Comply with code for firestopping systems for each condition encountered.

C. INS-07 Safing Insulation, Foil Faced:
2. Classification:
   a. ASTM C612, Class 1 or 2.
   b. ASTM C665: Type III, Class A.
3. Density and Thickness: Manufacturers recommended to achieve indicated fire rating.
5. Fire rating: ASTM E84, flame spread 25 or less and smoke development 10 or less.
6. Acceptable Products:
   a. Owens Corning Thermafiber: Thermafiber Safing Insulation.
   b. Roxul SAFE, Rockwool.
   c. Or equal.

D. Accessories: Provide accessories required by manufacturer, UL or other testing agency, and classification for specific application.
1. Sealant Primers: As instructed by manufacturer.
2. Sealant Damming Materials:
   a. Non-combustible.
   b. Chemically compatible with sealant.
   c. Mineral fiberboard, mineral fiber matting, or fibrous fire safing.
3. Cleaning Solvents: As instructed by manufacturer.
4. Labels:
   a. Provide label for each firestop condition.
   b. Type information in non-fading ink on 20 pound (minimum) paper.
   c. Include following information on each label:
      1) Manufacturer's name.
      2) Product name.
      3) Product type (sealant, putty, mortar, or other generic material description).
      4) F-Rating.
      5) W Rating.
      7) Testing and listing agency filing number, such as UL System number.

E. Select adhesives, primers and sealants meeting Cal-GREEN requirements.
1. Adhesives shall comply with VOC and chemical component limits of Cal-GREEN Table 5.504.4.1 Adhesive VOC Limit requirements.
2. Sealants and Sealant Primers shall comply with VOC and chemical component limits of Cal-GREEN Table 5.504.4.2 Sealant VOC Limit requirements.

2.3 CURTAIN WALL FIRE STOPPING SYSTEMS
A. Deferred Submittals for Curtain Wall Fire Stopping Systems shall not be permitted.
1. Fire Retardant Sealants and Insulation:
   a. Insulation: Approved semi-rigid curtain wall insulation and firesafing materials; coordinate with Section 072100 for materials to create fire rated assembly.
PART 3- EXECUTION

3.1 EXAMINATION
A. Examine conditions and proceed with work when substrate conditions are acceptable.
B. Verify that permanent penetration items have been installed and that temporary penetrating items have been removed.
C. Verify that supports have been installed on both sides of penetrated construction as required by UL classifications.
D. Inspect and verify that surfaces and condition of openings have no defects that could interfere with installation and performance of firestop materials.
E. Verify sleeves installed under plumbing, mechanical, and electrical work are properly installed.

3.2 PREPARATION
A. Clean surfaces of opening substrates free of dirt, oil, grease, loose and harmful materials which may adversely affect bond of materials to surfaces in accordance with manufacturers recommendations.
B. Test surfaces which have been previously painted, sealed, and treated with other coatings and compounds to ensure compatibility with materials and proper bond capability.
C. Remove incompatible coatings and materials which may affect firestop bond with surrounding surfaces.
D. Mask and protect adjacent surfaces from damage.
E. Prime surfaces as instructed by manufacturer.

3.3 FIRESTOPPING INSTALLATION
A. General: Install in accordance with manufacturer's details, applicable codes, UL or other testing agency classification requirements, and approved schedule and shop drawings.
1. Fire resistant systems without UL or other testing agency classification requirements shall be approved by authorities having jurisdiction before installation.
2. Install firestopping material in manner required to achieve F rating, W rating, and T rating required by UL classification, applicable codes, and authorities having jurisdiction.
3. Install firestopping material with sufficient pressure to ensure uniform density and texture, and to ensure proper filling and sealing of openings to create smoke seal.
4. Install forms and supports to arrest liquid and flowable material leakage and retain materials in openings.
5. Remove form materials after firestopping material has cured unless materials used are permitted or required to remain according to test classifications.
B. Through Penetration Firestopping Systems: Comply with classification design requirements. Separate cables not in conduit and maintain required separation of penetrating items from edges of openings and from each other.
1. Tool and trowel exposed surfaces to smooth finish, flush with surrounding surfaces unless otherwise required by test classification.
2. Remove excess firestop material promptly as work progresses.
C. Through Penetration Firestopping:
1. Securely attach device frames to supporting construction.
2. Assembly component parts to ensure proper contact and sealing of gaps and openings around penetrating items.
D. Curtain Wall Fire Containment, Foil Faced Safing Insulation:
1. Fill voids between curtain wall and edge of slabs at floors and roofs in accordance with manufacturer's instructions. Do not leave voids in safing.
2. Tape and seal tears and cuts in facing.
3. Seal joints with manufacturer's recommended sealant.
4. Provide flexible fire rated smoke seal tested and approved for dynamic movement.
5. Create fire rated assembly with UL design number.

E. Fire Resistant Construction Joints:
   1. Provide fire resistant systems to match fire rating of adjacent construction.
   2. Provide fire resistant systems at following locations:
      a. Voids and gaps in fire rated construction, including control joints and gap at top of fire-rated CMU walls.
      b. Fire rated partition and metal deck flutes.
      c. Changes in partition material.
      d. Floor joints not requiring expansion joint.
      e. Other locations indicated and required by applicable codes.

3.4 FIELD QUALITY CONTROL

A. Site Inspections: Comply with Division 01 requirements.

B. Inspection: Owner may engage and pay for services of independent testing consultant to perform quality control inspection.

C. Do not conceal firestops, fire containments, and fire resistant construction joints prior to required inspection by Inspector of Record (IOR) and authority having jurisdiction (AHJ).

D. Notify authority having jurisdiction and designated inspectors of work released for inspection.

E. Manufacturer’s Field Service: At the start of the installation, periodically as the Work progresses, and after completion, utilize the firestop material manufacturers’ representative at the job site as necessary to advise on every phase of the Work.

F. Listed documentation shall be provided by the Contractor or Subcontractor during inspections in accordance with 014100. Listed documentation shall be by the listing agency, not the manufacturer.

G. Labels:
   1. Provide label for each firestop/smoke seal condition.
   2. Securely fasten label immediately adjacent to firestopping condition to allow authorities having jurisdiction and owner’s inspection agency to readily identify and confirm system.
   3. Wall partitions are required to have protected openings or penetrations permanently identified with signs or stenciling. Such identification shall be located in accessible concealed floor, floor-ceiling or attic spaces:
      a. Be located within 15 feet of the end of each wall and at intervals not exceeding 30 feet measured horizontally along the wall partition and
      b. Include lettering not less than 3 inches height with a minimum 3/4 inch stroke in a contrasting color incorporating the suggested wording. “Fire and/or smoke barrier-protect all openings” or similar wording.

H. Inspection Requirements:
   1. Visually examine firestopping, fire containments, and fire resistant construction joints to verify compliance with Contract Documents.
   2. Examine firestopping, fire containments, and fire resistant construction joints for proper installation, adhesion, and curing appropriate for each material.
   3. Submit written inspection report including following information:
      a. Identify construction penetrated including fire resistance rating.
      b. Identify penetrating item.
      c. Identify products and manufacturers included in each system.
      d. Identify form material used.
e. Firestop classification and description from UL, FM, Warnock Hersey or other independent testing agency.

f. Fire containment and fire resistant construction joint description.

g. F, T, and W rating.

h. State whether firestop, fire containment, and fire resistant construction joint is or is not in full compliance with testing agency classification, description and manufacturer's requirements. If variations occur confirm acceptance of variation by manufacturer and authority having jurisdiction.

I. Re-examine firestopping, fire containments, and fire resistant construction joints immediately prior to concealment by other construction to ensure no damage has occurred since initial inspection.

J. Correct unacceptable firestopping, fire containments, and fire resistant construction joints, and provide additional inspection, to verify compliance with this Section, at no additional cost to Owner.

3.5 REPAIRS AND MODIFICATIONS

A. Identify damaged and re-entered seals requiring repair and modification.

B. Remove loose and damaged materials.

C. If penetrating items are to be added, remove enough material to permit penetration by new elements, being careful not to damage balance of seal.

D. Repair holes, cracks, and damage in accordance with manufacturer's instructions to ensure complete smoke seal.

E. Use only materials approved by manufacturer of original seal as suitable for repair.

3.6 CLEANING

A. General:
   1. Clean as instructed by manufacturer. Do not use materials or methods which may damage firestop or surrounding construction.
   2. Remove stains and correct damage to adjacent surfaces.

3.7 PROTECTION

A. Protect material subject to traffic from damage.

END OF SECTION