

# Maintaining Your Firestop Investment

A successful firestopping installation is only half of the safety equation. Effective compartmentation also requires ongoing inspection and maintenance.



By Bill McHugh

**F**ire-resistance rated walls, floors and their penetrating service items, treated to restore the wall/floor rating, are important parts of a building's fire- and life-safety program because they resist the spread of fire and smoke from one area to another. This important fire protection feature serves building occupants, who need havens of safety during building fires and safe routes to escape.

Fire walls and floors, firestopping, fire and smoke dampers and fire doors, as well as structural steel fireproofing, all need to be maintained to retain effectiveness, much like other systems in a building. At the LaSalle Bank fire in Chicago last year, a fire raged for more than five hours before traversing to the next higher floor, and the building was still standing after the fire was extinguished by Chicago firefighters. The value of vertical effective compart-

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At the LaSalle Bank fire in Chicago last year, a fire raged for more than five hours before traversing to the next higher floor, and the building was still standing after the fire was extinguished by Chicago firefighters. The value of vertical effective compartmentation meant the property could be renovated, instead of torn down and rebuilt.

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## Maintenance Checklist

The following are effective compartmentation maintenance procedures suggested by the Firestop Contractors International Association.

### Understand Compartment Locations on Construction Documents

- Fire wall/floor identification
- Fire barrier identification
- Fire and smoke barrier identification
- Smoke barrier identification
- Smoke partition identification

### Identify Compartments in Building

- Visit each compartment area
- Identify which walls and floors are fire-resistance rated construction
- Identify fire- and smoke-resistance rated construction
- Identify smoke barriers
- Identify smoke partitions

### Identify Compartments and Fire and Smoke Protection Features in Compartmented Construction

- Compartmentation visual inspection**
  - Fire and smoke wall inspection—Holes, gaps, wall-top gaps, joints, missing elements need continuity and repairs
- Firestopping systems visual inspection**
  - Labeling of firestop system
  - Visual inspection—Does assembly match tested and listed system?
  - Destructive testing—Does assembly match tested and listed system?
- Fire and smoke damper visual inspection and operational testing**
  - Labeling of fire/smoke damper system
  - Field construction verification to systems design
  - Operational test to verify damper activation and reset
  - Common deviations to UL 555 and 555-S
- Fire door and hardware visual inspection and operational testing**
  - Labeling on door, frame and hardware
  - Door operational status
  - Door hardware operational status
  - Automatic door-closer interface with fire- and smoke-detection system
  - Obstructions to fire door operation
- Fire glass**
  - Labeling of fire-resistance rated glass
  - Frame requirements
  - Visual inspection for holes

### Repair of Effective Compartmentation (EC) and EC Fire Protection Features (Wall and Floor)

- Masonry—Refer to International Masonry Institute, National Concrete Masonry Association guidelines for:**
  - Brick
  - Concrete block
    - Both NFPA 5000 and International Building Codes require that holes in fire-resistance rated concrete block and masonry be filled full-thickness with mortar to complete the assembly. This is true in hollow-core block assemblies and solid masonry structures. Firestop systems may be used as an alternative.
- Concrete—Follow American Concrete Institute documents for patching concrete walls and floors**
  - Solid concrete—Reinforcing steel may be required to hold concrete into an opening, allowing structural integrity to be returned to original specifications, if required. In cases where structural protection is not needed, firestop systems may be used to patch holes in fire-resistance rated construction.
  - Hollow-core concrete
    - Both NFPA 5000 and International Building Codes require that holes in fire resistance rated hollow-core concrete be filled full-thickness with mortar to complete the assembly. This is true in hollow-core block assemblies and solid masonry structures. Firestop systems may be used as an alternative.
- Gypsum Board Assemblies**
  - Board—Visual inspection of unpainted board to verify gypsum type is equal to tested system requirements. According to gypsum manufacturers, all 5/8-inch drywall is "Type X," a component of a fire-resistance rated wall assembly.
  - Framing—Verify that framing meets requirements of the tested and listed system
  - Patching requirements—Verify that patching systems meet tested and listed system requirements
    - Framing required—Patching of drywall systems may require framing to span from vertical to vertical studs to "frame" the area, creating resistance to hose-stream testing
    - Fire-resistance rated patching systems
      - Special clips available from gypsum and firestop manufacturers are used to reinforce the patch and make it an integral part of the wall. These clips, when used as patching forms, withstand hose-stream testing.
- Gypsum Block Assemblies**
  - Patching requirements
    - Gypsum block is similar to concrete block. New block can be used to patch full-sized block holes.
    - Drywall attachment to block alternative as recommended by manufacturer of gypsum block
- Plaster Assemblies**
  - Patching requirements per Plastering Institute and tested system guidelines



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compliance of door hardware to maintain compliance. Most importantly, the building owner and manager need to have education plans for building occupants and service personnel to keep doors in operable condition to maintain their effectiveness.

- **Fire-Resistance Rated Glass Assemblies**—Building owners and managers must document fire-resistance rated glass assemblies in fire-resistance rated construction. Once fire-rated glass is installed in an opening area, maintenance records are needed to understand maintenance and tested system parameters.
- **Fire-Resistance Rated Penetrations**—The building owner or manager must have documented firestop systems to complete the effective compartmentation system. The labeling or identification system should be derived directly from the as-built documentation for firestop systems. As with other elements of effective compartmentation, as-built documentation is essential for identification and maintenance of firestop systems. Building owners and managers should have a procedure in place to inspect and re-firestop penetrations that the cable installer, for example, or any others, may have made along the way between inspections.
- **Sprayed Fire-Resistive Materials (SFRM) and Fire-Resistance Rated Coatings**—SFRM and coatings need visual inspections and maintenance as well. Building owners need verification that the fireproofing materials are in place, and not damaged by traffic, vandalism or other means.
- **Effective Compartmentation Building Operations Procedure**—Effective compartmentation is a very important fire-safety building feature. Effective compartmentation, with penetrating items such as ducts, pipes, cables, beams and joint assemblies, plus perimeter fire protection, fire doors, fire and smoke dampers, and fire-resistance rated glass, performs a very important function in the built environment. It creates safe havens in buildings during fire conditions for those who are told not to evacuate. Havens of safety in buildings protect people, inventory and business operations by keeping a fire in the room

or place of origin and limiting vertical and horizontal spread of fire and the resultant high-heat conditions.

Fire-resistance rated construction creates these safe havens throughout buildings, in building corridors, stairwells and elevator shafts; sleeping and patient rooms; apartment unit separations; mechanical rooms; storage areas for inventory and hazardous chemicals; business operations and manufacturing areas; prison cells, floors and walls; and other areas of safety designated by code.

Effective compartmentation has its roots in the great Chicago fire of 1871. Ever since that disastrous fire in a town built originally with wood buildings, Chicago's leaders have insisted on fire-resistance rated construction materials and systems for both exterior fire spread from structure to structure as well as interior fire-spread protection. Wood building construction was displaced by masonry and plaster construction for greater fire protection outside buildings.

Effective compartmentation was next incorporated inside buildings to limit internal fire spread. When properly designed, installed, inspected and maintained, effective compartmentation can provide a level of safety that has now been in existence for more than 100 years.

To protect occupants, property and business operations, building owners should have procedures in place as standard everyday operation. For instance, it's important to have procedures for eliminating the propping open of fire- and smoke-resistance rated doors. Also, a maintenance schedule for self-closing doors is good business to assure that they are operating properly, and building occupants, owners and manager personnel should be educated about the result of fire doors being left open when a fire occurs.

Procedures also must exist for managing service personnel who breach a fire-resistance rated assembly in order to run services. FCIA recommends that the procedure for firestopping and documentation should be attached to contracts of electrical, plumbing, mechanical, cable/low voltage contractors, building personnel and others who may penetrate the fire- and smoke-resistance rated assemblies of the building.

This procedure should assign responsibility for verification of firestopping systems installed after new pipes, cables, etc., are installed, to either the mechanical/electrical/plumbing contractor, or a firestop systems specialty contractor working for the building owner or manager.

Effective compartmentation must be designed using tested and listed systems, installed, inspected and maintained. Fire-resistance rated walls and floors, fire and smoke dampers, fire doors, all need to be maintained by a firm qualified to understand the complexity of this type of work. For more information about specialty firestop contractors that provide these important effective compartmentation services, contact FCIA at 630-690-0682 or visit [www.fcia.org](http://www.fcia.org). ☺

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