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The Magazine of Effective Compartmentation



Life Safety DIGEST

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How Human Behavior Impacts Building Egress
Fire & Smoke Barrier Markings

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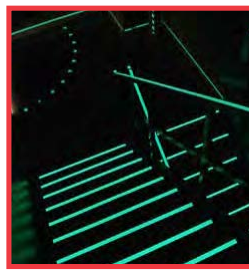
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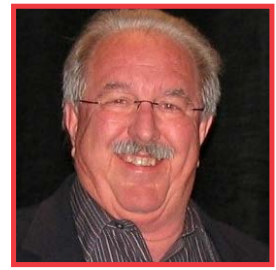
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Editor's Message

This past September marked the 10-year anniversary of the 9/11 attacks on the World Trade Center. While it was a time to remember the lives lost during that tragic day, it was also a time for the fire protection, effective compartmentation and firestopping industry to mark its continued commitment to building safety. Many important changes to the International Building Code were adopted as a result of 9/11. Among them were provisions that high-rise buildings more than 120 feet tall have elevators so that firefighters can access fires without having to walk stairs with heavy equipment and high-rises more than 420 feet tall have an additional stairway.

While these are important changes that will invariably save lives, we must not stop there. We need to continue our efforts to promote safety, not only in high-rise structures but in educational, healthcare and other occupancies. The need for continued vigilance worldwide became apparent after a fire in the AMRI healthcare facility in Kolkata, India in early December, resulted in over 90 deaths of patients and four staff members. News reports state the road leading to the hospital was narrow and congested. Inside the hospital, doors and windows were locked. Windows had to be smashed by the firefighters.

Inside this issue of Life Safety Digest, you'll find a report on the Kolkata fire, along with articles on the importance of DIIM, firestop inspections, fire and smoke barrier markings and the human behavior of egress. Enjoy and let's make 2012 the safest year on record!

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How to Evaluate Firestop Inspection Agencies

By Bill McHugh

For high rise structures in the 2012 International Building Code (IBC) Section 1705.16, there is a requirement for inspection of firestopping per ASTM E 2174 and ASTM E 2393, Standards for the On-Site Inspection of Installed Firestops.

This is required for high rise buildings (greater than 75 feet above fire department access) or in buildings assigned to Risk Category III or IV in accordance with section 1604.5 of the IBC.

The difficulties analyzing firestop systems are no different than the complications of installation processes. The "zero tolerance to variation" philosophy is required of both the installer and inspector firm and their employees.

Although there are very few qualifications of the inspector required by the ASTM E 2174/ASTM E 2393 Standards or the IBC code, specifiers, building owners and managers should consider hiring an inspection agency that has experience in firestop inspection to perform this work.

International Accreditation Services (IAS) has developed criteria for the accreditation of special inspection agencies. Inspection agencies can be accredited to Accreditation Criteria (AC) 291.

Special Inspection Agency (SIA) personnel who have passed the FM 4991 or UL Firestop Exam provide a knowledge base equal to the installer company. This knowledge is critical for the true cost of firestopping to be reflected by the installed firestop systems.

Why is firestop specific knowledge needed by the SIA personnel?

An unqualified firestop inspector may not appreciate or understand the importance of the zero tolerance protocol needed to get firestopping installed to the listed system.

An unqualified inspection agency may let bad firestop installations pass causing a life safety risk in buildings.

Conversely, an unqualified firestop inspector may over inspect, increasing the costs of inspections and perhaps causing unnecessary delays to the construction schedule. Below are a few questions to ask an inspection agency about its qualifications:

1. Is firestopping one of the primary businesses of the firm?
2. Insurance protection is important. Does the inspector have adequate workers' compensation, finished products, general liability and or, errors and omissions insurance as required by local ordinances?
3. Does the firm have experience inspecting the particular firestop materials and systems submitted on the project?
4. Is the inspection agency IAS AC 291 Accredited? Have the individuals inspecting passed the FM or UL Firestop Exam?
 - a. The inspection agency should know to check if the contractor company to be inspected is approved to FM 4991, Standard for Approval of Firestop Contractors, or a UL Qualified Firestop Contractor.
 - b. The inspection agency should know to ask for the installer company certificate from Underwriters Laboratories, FM Approvals, **and** also the individuals Designated Responsible Individual (DRI) Certificates.
5. Does the inspection agency belong to international trade associations? These associations provide educational opportunities for employees and workers in many topics (visit FCIA.org, member lists to verify).
6. Does the inspection agency have references for similar projects? If so, call the references.
7. Did the inspection agency provide a written detailed proposal?
8. Does the inspection agency understand what hourly fire-resistance (F) ratings, temperature (T) and air leakage (L-smoke) ratings are specified to meet the scope of work laid out in construction documents? Does the inspector understand how to analyze these?
9. Have you verified the inspector's addresses, Tax I.D. number, and phone and fax numbers?
10. Does the inspection agency understand what is in ASTM E 2174 & ASTM E 2393?
 - a. Does it meet the criteria in ASTM Practice E699?
 - b. Does it (and the inspector) have two years of experience in construction, field inspections and education have credentials acceptable to the AHJ?
 - c. Is it a Quality Assurance Agency accredited by the AHJ?
 - d. Is the inspection agency related to the

contractor company installing? Is the inspection agency a competitor of the installer? Is the inspector a distributor or manufacturer?

Any one of these points is a conflict-of-interest that eliminates the firm from meeting ASTM E 2174 and ASTM E 2393 Inspection Standards Requirements.

11. What kind of management system quality and safety program does the firm have in place to protect you and its employees? Does it have any certifications, such as IAS AC 291?

12. Who supervises inspectors?

These are questions you should ask to evaluate an independent inspection agency.

Firestopping contractors all provide services to return the fire-resistance-rated or smoke-resistant wall or floor to the rating it had before an opening was made for a door, penetrating item, or other services in the building. Firestop inspection agencies verify through observation and destructive testing that the installer is getting the job done right.

As an association, FCIA suggests focusing on the quality and the quantifiable qualifications that make the contractor and / or inspector capable of performing the scope of work on the particular building's firestopping project.

Unqualified contractors or inspectors do not provide the best value for installed firestopping in buildings. It's only when both parties understand the zero tolerance company culture required to get firestop materials installed to the listed system that this important fire and life safety service is completed on time, accurately. With unqualified contractors, bigger burden is placed on inspectors resulting in increased inspection possibly slowing completion dates...and at no fault of the inspection agency. Using a firestop inspection agency with experience and certifications and a specialty firestop contractor aids in the firestop material installation process.

This truly provides the way to restore the integrity of the fire-resistance-rated effective compartmentation that keeps people safe in buildings...at the right price.

Bill McHugh is Executive Director of the Firestop Contractors International Association. Visit FCIA.org, member lists, consultants to find firestop inspection firms. Contact him at bill@fcia.org.



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Fire Wrapping Insulation Overcomes Clothes Dryer Ventilation Threats

By Clay Booth

Fire-rated separation between multi-family dwelling units in wood frame construction is seriously threatened when clothes dryer ventilation ducts are routed within fire-resistance-rated floors, ceilings and attic spaces. In the past, clothes dryer ventilation duct code requirements have been difficult to achieve in real world conditions, but a new one-hour rated system is available that protects ducts that either penetrate or are located inside fire-rated assemblies. The solution, which includes a single layer of 1-inch-thick, high temperature insulation applied to a 4-inch-wide, 30-gauge galvanized iron duct, is a viable and cost effective solution for safely routing dryer exhausts from a laundry room to outside the building.

Penetrations That Interfere with Fire Barriers

Construction of wood frame multi-family projects follows the International Building Code (IBC), which requires fire-resistance-rated separation between dwelling units. This translates to one-hour fire-resistance-rated walls between units on each floor and one-hour fire-resistance-rated floors/ceilings separating units between levels. Projects with more than three stories require two-hour fire-resistance-rated separations.

Mechanical and electrical systems routed within and between housing units create penetrations that can interfere with fire barrier integrity. Guidelines for clothes dryer ventilation, bathroom vents, HVAC ducting, and the like are typically codified in the International Mechanical Code (IMC), a full listing of mechanical system requirements that closely references the IBC. IMC Section 504, *Clothes Dryer Exhaust*, recognizes the importance of fire compartmentation and describes the requirements for domestic and commercial clothes dryer ventilation. Section 504.2 *Exhaust Penetrations* states:

“Ducts that exhaust clothes dryers shall not penetrate or be located within any fireblocking, draftstopping or any wall, floor/ceiling or other assembly required by the International Building Code to be fire-resistance rated, unless such duct is constructed of galvanized steel or aluminum of the thickness specified in Section 603.4 and the fire resistance rating is maintained in accordance with the International Building Code. Fire dampers, combination fire/smoke dampers, and any similar devices that will obstruct the exhaust flow, shall be prohibited in clothes dryer exhaust ducts.”

This can be interpreted to mean:

1. Dryer vents should not be routed inside or through fire-resistance-rated construction whenever possible.
2. When dryer vents must be routed inside or through fire-resistance-rated construction, the use of dampers is prohibited.
3. Because dampers are prohibited and the integrity of fire-resistance-rated construction is therefore compromised, the duct must be metal of substantial construction and must be protected in accordance with the IBC.

Stipulating that dryer vents should not be routed through rated construction would, in practical terms, require that all clothes dryers be placed on outside walls and vented directly through the wall, or that dryer vents be run below the fire-resistance-rated floor/ceiling and concealed in a soffit. This is impractical, since routing the dryer vents inside the living spaces can result in unsightly construction, increased construction costs, and use of valuable living space. A more typical location of clothes dryers is an interior room, with ventilation running up or down inside the interior wall and to the exterior of the building, using the space between the framing of the one-hour or two-hour wood framed floor/ceiling assembly. See **Figure 1**.



Figure 1 – Ventilation in space above ceiling, below floor. Thermal Ceramics Photo.

Due to real world constraints, it is common practice in the United States for dryer vents to penetrate into the bottom membrane of a fire-resistance-rated floor or ceiling to route to the exterior of the building, even though this practice appears to be prohibited in IMC Section 504.2. For ducting that penetrates through fire-resistance-rated floors/ceilings and walls, the IBC often requires either fire or fire/smoke dampers within the rated assembly to maintain integrity in the event of a fire.

However, IMC Section 504.2 expressly prohibits dampers in clothes dryer vents because they may interfere with the duct's function or may create hazards (for instance, a dryer vent damper could accumulate combustible lint). Instead, Section 504.2 requires metal ducts of more substantial construction, which must be protected in accordance with the IBC. For example, IBC Chapter 7 describes methods of protecting penetrating items using shaft construction tested per ASTM E119, (a time versus temperature profile) and penetrations of rated assemblies tested per ASTM E814 (evaluates through penetration firestop systems for assembly integrity, flame spread and potential to ignite nearby combustible materials.)

The one-hour or two-hour fire-resistance-rated floor/ceiling that separates one dwelling unit from another will be a UL or other Nationally Recognized Test Lab (NRTL) assembly that is tested and listed per ASTM E119. The bottom membrane will typically have one or two layers of fire-rated gypsum board, with furring and joists to create adequate assembly strength and separation from the top membrane, which is made of plywood. These systems are tested and listed without penetrations and without mechanical and electrical systems running inside the space between the gypsum and plywood membranes. Where certification is requested by a test sponsor with pipes or ducts inside the joists spaces, the listed design will reference the size, quantity, and construction of these items.

The Section 504.2 requirement that clothes dryer vents have a "fire-resistance-rating [that] is maintained in accordance with the International Building Code" translates to enclosing ducts in shaft wall construction of equal rating to the assembly being penetrated, or the assembly within which the duct is run. Typical one-hour shaft walls consist of one layer of fire rated gypsum board on both sides of a J- or S-shaped steel framing member, requiring 4 to 5 inches of space on all sides of the duct, a solution that is not practical, due to space constraints inside the framing members of a typical one-hour or two-hour floor/ceiling assembly.

With the IBC language and references being somewhat ambiguous, and with real world solutions being costly or interfering with other design constraints, a common compromise practice in actual building conditions is increasing the duct gauge (30 gauge galvanized steel is often a minimum) and sealing the penetration of the bottom membrane with a fire blocking material or modified firestop system (often

claiming an F-Rating, but with a diminished or often zero T-Rating). **Figure 2** shows a typical modified firestop system allowed in many jurisdictions.

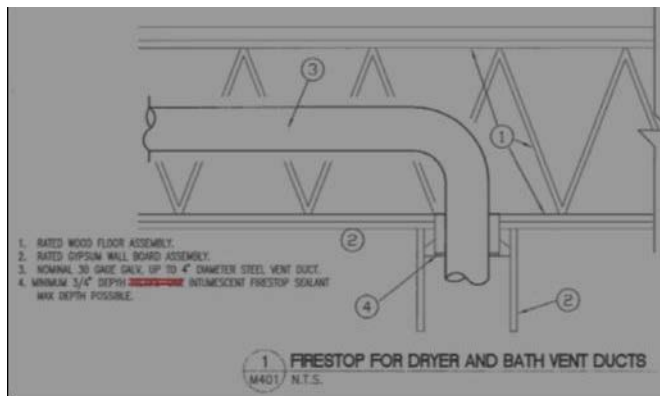


Figure 2 – Typical jurisdiction allowed firestop. Thermal Ceramics Photo.

Fire Wraps as Alternatives to Typical Shaft Construction

Over the past 20 years, many fire-rated insulations have entered the construction market with testing done to ASTM and ISO fire standards. These "fire wraps," applied directly to the duct in thicknesses of 1 to 4 inches, are used to create one- and two-hour fire-resistance-rated assemblies as alternatives to typical shaft construction and to reduce clearance from hazardous ducts to nearby combustible construction.

Fire wraps are now commonplace for grease duct enclosures on ducts venting Type 1 commercial hoods, where testing is done per ASTM E2336, required by IMC Section 506. Many jurisdictions across the United States and Canada have reviewed these fire wraps as an alternative protection method in lieu of more traditional shaft wall construction and have found them to be safe and cost effective solutions, particularly in horizontal applications where even shaft wall construction becomes costly, space consuming, and has marginal testing to support proper construction techniques.

In January 2011 UL published new duct (HNLJ, V29) and firestop (F-C-7055) listings, which are tested specifically on a 4-inch diameter 30-gauge galvanized steel duct, and achieving a one-hour rating using a single layer of 1-inch-thick insulation applied with minimal overlaps and tie-wired to the duct using 14-gauge steel wire.

When compared to typical grease duct fire wrap installations, and even two-hour rated fire wraps, this one-hour rated system is clearly optimized to provide building owners, designers, and code officials with a real world solution that can be adopted to meet the intent of IMC Section 504.2 and protect ducts penetrating or inside fire-resistance-rated assemblies to the same level as the one-hour floor/ceiling assembly. This one-hour system would have broad applicability for the two- and three-story multi-unit housing complex where one-hour wood frame floors are often

a design feature, and where clothes dryer vents are run in the space between the membranes, effectively creating a rated duct inside the rated assembly. It can supply a viable and cost effective solution for safely routing dryer exhausts from the laundry room to the exit of the building.

In addition to certification testing for HNLKJ.V-29, the test sponsors also contracted UL to install two ducts for performance comparison (See **Figure 3**).



Duct B **Duct A**
Figure 3 – Thermal Ceramics Photo

Duct A, an uninsulated 4-inch diameter 30-gauge galvanized iron duct, is routed 1 foot into the furnace chamber, routed into the joist space and exits through the side of the one-hour assembly. The bottom membrane penetration and the outside framing member were firestopped with a readily available intumescent caulk often used for one-hour and two-hour F-Rating. Duct B is the same size, gauge, and routing as Duct A, but is firestopped according to F-C-7055 and insulated according to HNLJ.V-29. Both ducts were fully instrumented with thermocouples positioned using ASTM E814 guidance; additional thermocouples were installed under the plywood subfloor membrane.

Comparative test results dramatically highlighted the hazard of leaving ducts to conduct and radiate energy directly into the joist space below the plywood membrane. The underside of the uninsulated Duct A's plywood reached 925°F (496°C) at the one-hour mark; rolling flames were visible inside the duct from 20 minutes into the test until its termination. The ASTM E814 thermocouples failed the T-Rating requirements in 41 minutes. In Duct B, insulated per HNLJ.V-29, the underside of the plywood reached 252°F (122°C) at one hour and passed the requirements for a one-hour F- and T-Rating on the unexposed penetration. No flames and a limited amount of smoke were observed inside this protected duct.

Since the plywood subfloor itself is combustible,

and the carpet, padding, and furniture above even more so, IMC appears to be amply justified in requiring that ducts either not be run through or inside fire-rated floors and ceilings, or that they are protected by traditional gypsum shaft construction or with a fire wrap system applied directly to the duct to effectively provide an equal T-Rating at the penetration and on the underside of the plywood subfloor.

As manufacturers of fire wraps have optimized their systems for one-hour protection of this small diameter light gauge duct, it is clear that the systems on the market today would have a minimal cost impact on the individual housing unit and will fit in the tight joist spaces afforded inside one-hour wood frame floor and ceiling assemblies. Building owners, designers, officials, and ultimately tenants, can sleep with more peace of mind knowing that this system provides appropriate fire separation.

Clay Booth, BSME, MBA, is Fire Protection Market Manager for Morgan Thermal Ceramics and is active in the passive fire protection industry as a participant in NFPA, ICC, and ASTM. Morgan Thermal Ceramics manufactures FireMaster® DryerWrap for application on dryer vent ductwork in multi-unit housing where fire compartmentation and life safety are major concerns. 🔥

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“What If....”

By Randy Bosscawen

The AMRI healthcare facility fire in Kolkata, India resulted in over 90 deaths of innocent patients and four staff members in the building. According to NDTV reports, the fire started in the basement of the building constructed in 1996 due to highly flammable material storage. Eyewitnesses say they first spotted and reported smoke streaming from the hospital around 3 a.m. on Dec. 9.

It was rumored that staff evacuated prior to patients being moved to safety. Six healthcare executives were arrested and are facing court prosecution in mid-December. In late December, two AMRI officials were arrested on charges of negligence, and are in judicial custody until Jan. 5.



Officials remove a person from the facility. NDTV Photo

Families grieve the victims of the smoke that smothered people who were immobile.

Why did this happen? How can it be prevented?

The first fire engine arrived two hours after the first call from an occupant at 3 a.m. Fire department Director General Fire Services D Biswas stated the fire brigade was informed at 4:10 a.m. At the time of the fire, there were 160 patients inside, including around 40-50 in intensive care units.

News reports state the road leading to the hospital was narrow and congested. Inside the hospital, doors and windows were locked. Windows had to be smashed by the firefighters.

In India, high rise buildings are 15 meters or above in height. With an average height per floor of 4 meters, clearly this six-story building is “high rise.” Additionally, the building falls into Group C-1 Occupancy category, hospitals, which have additional provisions for fire and life safety to be designed into the structure.

According to the 2005 National Building Code of India (NBC-India), in high rise buildings there are four requirements for means of access to the building. Statements such as “main street width not less than 12 meters; not terminate in a dead end; open spaces around the building shall not be used for parking and adequate passageway and clearances required for fire fighting vehicles to enter the premises shall be provided; widths of entrances shall not be less than 4.5 meters with any arch or covered gates shall have clear head room of 5 meters.” are part of the Code.

Yet, fire trucks arrived at 5 a.m. Even with a 4:10 a.m. notification, there was still a 50 minute travel time to the fire scene.

News reports also stated that “fire stops” are required inside shafts at every other floor in shafts built for air conditioning. Yet, the news reports state that the mandatory precaution was not followed. “Vertical fire stop seals of shafts at every other floor to prevent air from passing through and spreading to other floors” could have averted the problem, according to news reports.

According to the NBC-India, the definition for “fire stop” is ...

2.21 Fire Stop — A fire resistant material, or construction, having a fire resistance rating of not less than the fire separating elements, installed in concealed spaces or between structural elements of a building to prevent the spread/propagation of fire and smoke through walls, ceilings and like as per the laid down criteria.

...a fire resistant material, or construction, having a fire resistance rating...is defined.

“What if...”

Firestop systems are not a new product worldwide. Major manufacturers of fire stop products from around the world market their products.

Fire stop contractors exist throughout the world providing material installation to zero tolerance instructions from recognized testing laboratories such as Underwriters Laboratories, FM Approvals, Warrington and Intertek. Laboratories also have approval programs for contractors that provide proof the companies have processes in place to result in fire stop installation to the listed firestop system design.

The NBC-India states that the rating of fire-resistance-rated construction be maintained where penetrating items such as wires, cables, ducts pass through. Standards and building codes require effective compartmentation. Yet, fire spread from the basement to patient areas.

Fire department officials blamed the AMRI hospital for “turning into a death trap,” states Mr. Biswas, while AMRI staff states “all statutory safety and fire licenses are in place,” said S Upadhyay, Sr. VP at the hospital.

Is fire stop the only solution to this problem? It is a partial solution. Several items seem to need addressing after this disastrous event. Imagine if...patient areas had properly designed, installed, inspected and maintained fire-resistance-rated and smoke-resistant:

- Wall and floor assemblies
- Fire stops at every other floor, at walls where services exit the shaft, and more.
- Fire dampers in air ductwork
- Fire rated doors in corridors
- Fire rated glazing in doors, walls

AND....

- Staff educated and trained in emergency defend in place methods
- A properly designed installed, inspected and maintained suppression system

Throughout the world, there are similar issues in buildings. Do staff and occupants at every building take evacuation drills seriously? Does the building industry understand why multiple means of protection are needed in buildings, regardless of occupancy category? Building owners and managers? Developers? Real estate professionals? Contractors? Designers? Building and fire officials?

The key point is, imagine if you are in the building when fire breaks out:

- Do you know the two ways out?
- Is the exit way out protected from danger by fire doors, fire stops, fire dampers and fire-resistance-rated construction that also protects against smoke spread?
- Is there a properly designed, installed, inspected and maintained sprinkler system in the building?
- Has the fire detection and alarm system been tested with fire drills for staff and occupants?
- Can the fire department get to the building?

There has been a worldwide debate about reducing the cost of construction and maintenance by removing effective fire-resistance-rated compartmentation features in buildings and replacing it with a sprinkler system.

There are many asking why this India tragedy had to take place...and what other buildings are possibly at risk as well. It seems the problem may be more widespread than expected in other major cities in India.

According to the Times of India, there are 133 hospitals in Surat, India (close to Mumbai). As of Dec. 27, only two complied with all safety requirements after checks by the fire brigade in Surat.

At the Firestop Contractors International Association (FCIA), we believe in total fire protection for fire and life safety in buildings. With properly designed, installed, inspected and maintained fire-resistance-rated and smoke-resistant construction, detection and alarms, suppression, plus staff and occupant education to building emergency procedures, safe buildings result.

Why total fire protection?

Total fire protection means the building is protected if something doesn't work. Sprinkler systems, effective compartmentation, detection and alarms all have a failure rate. If the sprinklers fail, effective compartmentation keeps fire in the room of origin. If the effective compartmentation fails, sprinkler systems suppress the fire until the fire department gets there to extinguish it.

Take the initiative in your building. Check out the fire doors. Do they latch when self closing?

Look at fire rated walls. Do they have holes in them where pipes and cables go through?

Check sprinkler heads. Are they obstructed? Are things hanging on them? Have they ever been tested?

Did you ever hear the alarm in a building? What does it sound like? What is the evacuation plan? Where are assembly points?

Ask these questions. If not answered to your satisfaction, insist that the building owner and manager hire a qualified inspection and installation firm to find problems and fix the sprinklers, alarms, walls and doors.

Most importantly, plan your escape from the building in an emergency. Make sure you, or the staff who has to move you, understands what to do and where to go should emergencies arise.

Sound like too much to worry about? Really?

Why should we not learn and ask about fire and life safety systems in buildings? Why not teach this in primary schools through universities so the next generation demands safe buildings with total fire protection. Why not demand that contractors educate themselves in each fire and life safety trade to high quality standards? Why shouldn't building owners and managers, building officials, and specifiers insist on qualified firms and individuals for firestopping?

And, finally...why not drive your family and kids crazy by insisting they know two ways out of buildings...or carry a small flashlight everywhere to be ready for anything.

Their life, and yours, depends on the “why not and what if.”

Randy Bosscawen is President, Multicon Fire Containment. He can be reached at rbosscawen@multicon.us

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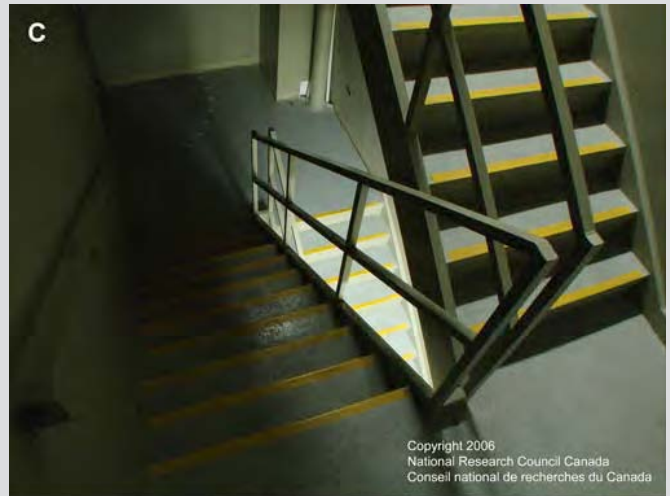
By Jim Armour

We recently observed the 10th anniversary of the attack on America that will be forever known as 9/11. That tragic day saw the loss of nearly 3,000 innocent lives from New York City to Arlington, VA to a farm field in Shanksville, Pennsylvania. The City of New York reported 2,749 deaths that day; more than 1500 of the fatalities were building occupants of the World Trade Center complex. The good news from that terrible day was that over 16,000 people safely evacuated the twin towers – thanks, in part, to the Photoluminescent Exit Path Markings that glowed in the dark when all emergency electrical lighting failed.

The U.S. National Institute of Standards and Technology (NIST) investigation of the collapse of the World Trade Center Towers yielded 31 recommendations to improve the safety of high-rise structures and emergency responses. These recommendations resulted in 23 changes to the 2009 editions of the International Building and Fire Codes and another 17 changes were adopted to the 2012 editions. The 2009 International Buildings Code and the International Fire Code has already been adopted by 22 states and many more municipalities and 12 more states will complete their adoption process early next year. One of the recommended changes was to add photoluminescent exit path markings within the emergency escape stairwell enclosures of all buildings over 75 feet in height. This was noted in the NIST report as aiding and accelerating the occupant evacuation of the buildings prior to collapse.

One of the first documented studies on photoluminescent egress path markings vs. electrical lighting and its impact on the rate of occupant evacuation was performed by the National Research Council of Canada under the direction of Dr. Guylene Proulx in April 1999. Dr. Proulx's research evaluated the speed of evacuation of building occupants under a controlled fire drill. Four identical stairwells in the same building were outfitted differently for evaluation.

- Stairwell C.(see insert) Full Electrical Lighting – No PL Markings
- Stairwell B.(not shown) Reduced Lighting @ 74 Lux – PL markings added
- Stairwell D.(not shown) Reduced Lighting @ 57 Lux – PL markings added
- Stairwell E.(see insert) No Electrical Lighting – PL markings only



Stairwell C

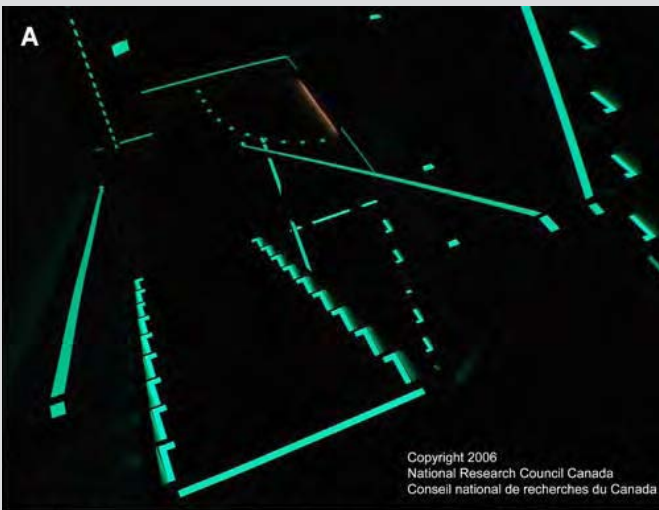


Stairwell E

The occupant's speed of evacuation was timed by researchers in all stairwells during the fire drill. The results showed that the speed of evacuation in the standard lighted stairwell (C.) and the stairwell with no electrical lighting and only photoluminescent markings (E.) was statistically equal. The research was repeated in June of 2007 and the results were duplicated. Of note; the study also concluded that more was not better in this case. Stairwell G (see insert) was found to be over powering and delayed evacuation and Stairwell A.(see insert), with only "L" markings on the steps, did not provide adequate definition to the stairs and slowed evacuation.



Stairwell G



Stairwell A

The NIST study also documented the increased rate of occupant evacuation with photoluminescent egress markings. After the 1993 bombing of the World Trade Center complex, the Port Authority of New York and New Jersey added Photoluminescent Egress Markings to all emergency stairwells in the World Trade Center Towers 1 and 2. Although casualties in the 1993 bombing were significantly less than on 9/11, the loss of power due to the bomb blast was almost instantaneous. Because of this, it took more than **6 hours** to totally evacuate the Twin Towers in the dark. Recognizing the need to improve the evacuation times, the Photoluminescent Exit Path Markings were added to improve egress rates in the event of another power failure. On September 11, 2001, the total elapsed time between the first airplane impact on the first tower until the collapse of the second tower was only **102 minutes**. Even with the failure of the emergency back-up power systems more than 16,000 people escaped during that time, many in total darkness. The twin towers Photoluminescent Exit Path Marking Systems worked -- even when the back-up electrical lighting systems failed.

Using the research from both these studies, the code committees developed the following requirement to place photoluminescent markings within the exit enclosures of buildings 75 feet tall or more upon all (see inset photo):

- Handrails
- Stair Treads & Landings
- Demarcation Lines
- Exit Door Markings & Directional Signage
- Obstruction Markings

Doors within the exit enclosure and final exit doors from the enclosure are required to have a 1" or 2" stripe around the door frame and the emergency exit symbol mounted on each door no more than 18" above the floor. Additionally, door hardware shall be marked with no less than 16 square inches of luminous material. This marking shall be located behind, immediately adjacent to, or on the door handle and/or escutcheon. Where a panic bar is installed, such material shall be no less than 1 inch wide for the entire length of the actuating bar or touchpad.

Placement and dimensions of markings shall be consistent and uniform throughout the same exit enclosure. Luminescent exit path markings shall be permitted to be made of any material, including paint, provided that an electrical charge is not required to maintain the required luminance. Such materials shall include, but not limited to, self-luminous materials and photoluminescent materials. Materials shall comply with either:

1. UL 1994, or
2. ASTM E 2072, except that the charging source shall be 1 foot candles (11 lux) of fluorescent illumination for 60 minutes, and the minimum luminance shall be 30 milicandelas per square meter at 10 minutes and 5 milicandelas per square meter after 90 minutes.

It is highly recommended that building owners use only products that have been tested and are listed with independent third party testing laboratories for compliance to these performance standards.

Installation of Photoluminescent Egress Path Marking Systems is not an overly difficult process and in many circumstances can be accomplished with the buildings maintenance personnel following the manufacturer's installation instructions. However, most manufacturers will refer you to a Certified Installer in your local area that has received detailed installation training for their products. This includes proper surface preparation along with installation procedures to insure many years of maintenance free performance. The manufacturer's Certified Installer will also be trained on proper location for the photoluminescent markings to comply with your local code officials requirements. For a listing of photoluminescent manufacturers go to the Photoluminescent Safety Association website at www.plsafety.org.

With significant technological improvements in long-lasting glow-in-the-dark pigments and products, today's Photoluminescent Exit Path Marking Systems offer a much higher performance in brightness and length of time for visibility at a significantly lower cost. With proper installation most high-rise buildings can be retrofitted for pennies a square foot and building owners can enjoy maintenance free performance for more than 25 years.

In these difficult economic times the question is often asked, "Are these building requirements really necessary?" America has the best record for preserving life and property of any country in the free world. That's because we continually seek to learn from disasters, natural or manmade, to improve our living environment. Disasters like the MGM Grand Fire in Las Vegas, NV caused the development and installation of moveable expansion joint fire barriers to contain and compartmentalize smoke and fires in commercial structures. The high rise fire at One Meridian Plaza in Philadelphia, PA that took the lives of three fire fighters who were disoriented and over

powered by dense smoke lead to the addition Stairwell Identification signage to our codes. The collapse of the World Trade Center Towers caused the addition of Photoluminescent Exit Path Markings to aid occupants in rapid evacuation and First Responders in accessing the building, even in total darkness. May we always strive to provide the highest degree of Fire and Life Safety in our commercial structures!

James Armour has served as President and Chief Executive Officer of Balco Inc, since March of 2004. Jim also serves as Executive Vice President of the Photoluminescent Safety Association and is a member of the Board of Directors. Jim can be reached at: jima@balcousa.com

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How Human Behavior Impacts Building Egress

By Natalie Keith

Editors note: Each year around Sept. 11 in the United States, there are many articles on high rise building safety. FCIA was amazed by Ms. Guylene Proulx 2006 education program at FCIA's Education and Committee Action Conference in Montreal. Her knowledge, passion for research and education about both engineering and behavioral sciences in buildings were evident. In this article are excerpts from her published research. We were honored to know her.

A high-rise building's fire safety systems are securely in place. Fire doors have been installed and tested, the rest of the passive fire protection system, sprinklers and the fire alarm system is working properly. So, in the event of a fire, will building occupants be protected? The short answer: Maybe.

Unfortunately, fire systems are sometimes installed without regard to how humans actually behave during a fire. For example, occupants may ignore a fire alarm if a building has a high incidence of false alarms. Or fire doors may not work properly because tenants of an office building have placed door stops to facilitate free movement throughout the building.

In 2001, Guylene Proulx, Ph. D released results of research conducted on occupant behavior and evacuation. This chart, excerpted from Ms. Proulx' research, summarizes the impact that occupant, building and fire characteristics have on evacuation:

Generally, the public has not been well-trained in fire development or dynamics to respond appropriately to a fire alarm. Without understanding these dynamics, occupants may not respond when they should. Secondly, fire characteristics can play an important role in the occupant response. Without smell from smoke or the noise of breaking glass, the fear factor may not create enough need to evacuate soon enough.

According to Proulx, people in multifamily dwellings may not react quickly to alarms for many reasons. People who are committed to an activity, such as preparing dinner or watching a movie, may not respond quickly. Also, a high number of false alarms in a structure means people might draw the conclusion that "this is another false alarm" and not respond to the alarm. This is due to the time that people take to internalize that there is an alarm.

Think about people living in a high-rise, multifamily building or tenants in a high-rise office building. People are engaged in a wide range of activities and, in fact, may ignore a fire alarm and not even hear it at all. In offices saving files, finishing e-mails, retrieving belongings, and participating in

Table1: Factors having an impact on Human Behaviour in Fire

Occupant Characteristics	Building Characteristics	Fire Characteristics
Profile <ul style="list-style-type: none"> Gender Age Ability Limitation 	Occupancy <ul style="list-style-type: none"> Residential (lowrise, midrise, highrise) Office Factory Hospital Hotel Cinema College and University Shopping Centre 	Visual cues <ul style="list-style-type: none"> Flame Smoke (colour, thickness) Deflection of wall, ceiling, floor
Knowledge and Experience <ul style="list-style-type: none"> Familiarity with the building Past fire experience Fire safety training Other emergency training 	Architecture <ul style="list-style-type: none"> Number of floors Floor area Location of exits Location of stairwells Complexity of space/Wayfinding Building shape Visual access 	Olfactory cues <ul style="list-style-type: none"> Smell of burning Acrid smell
Condition at the Time of Event <ul style="list-style-type: none"> Alone vs. with others Active vs. passive Alert Under Drug – Alcohol – Medication 	Activities in the Building <ul style="list-style-type: none"> Working Sleeping Eating Shopping Watching a show, a play, a film, etc. 	Audible cues <ul style="list-style-type: none"> Cracking Broken glass Object falling
Personality <ul style="list-style-type: none"> Influenced by others Leadership Negative toward authority Anxious 	Fire Safety Features <ul style="list-style-type: none"> Fire alarm signal (type, audibility, location, number of nuisance alarms) Voice communication system Fire safety plan Trained staff Refuge area 	Other cues <ul style="list-style-type: none"> Heat
Role <ul style="list-style-type: none"> Visitor Employee Owner 		

teleconferences and/or meetings all may cause people to ignore an alarm.



Chicago's codes have fire-resistance, detection and alarms, sprinklers and education/fire drills for safety in high rise buildings. FCIA Photo

Proulx reports that in a high rise residential structure, occupants began evacuating a building after a 10-minute delay at night, after they had heard the alarm and saw light smoke in the corridor. And, only half the occupants evacuated during the fire.

Proulx's research found that, among many factors, the delay in starting evacuation could be attributed in part to the type of warning occupants received. The fire alarm signal was found to be the least reliable cue of a fire since there are false alarms, tests and pranks, which reduce the credibility of the signal as an indication of fire. A warning by others appears to be a better indication of an actual problem. Receiving a message through a voice communication system or directly from staff seems to be the queues that are taken most seriously by occupants resulting in promptly leaving the building.

Proulx recommends that on-site responsible building personnel be quick to provide signals to get people moving quickly. She and others warn that waiting the five or 10 minutes for the fire department to arrive could be lethal due to the occupants' need to move through smoke-filled areas in an attempt to reach safety. She recommends messages are simple, direct and truthful, with location of the fire essential. Strategically placed closed circuit TVs facilitate the communication of conditions to direct people to the right egress path.

According to the article, a critical factor in response time and egress system familiarity is occupant education. Staff training in all occupancy types should include regular training and evacuation drills. Office building occupants are likely to look for building personnel and others in positions of authority for feedback and direction. Drills are valuable tools for training to assess the effectiveness of building fire safety plans. Feedback from staff and occupants after a drill helps identify areas that need improvement.

Increasing Response Speed to Alarms

This article focuses on the delays in evacuation after a signal is sounded. However, there have been behavioral changes since Sept. 11, 2001. After the events of 9/11, high rise occupants appear less likely to accept a phased evacuation approach. The problem with this is the likelihood that smoke could enter stairwells. She states further that "it is essential for engineers to properly design systems to allow occupants in and let smoke out...based on realistic expectations regarding occupants' likely response during a fire."

In office buildings, there are multiple activities going on at once. Proulx recommends making an abrupt change to the sound or lighting of an environment to get the attention of occupants, which increases response time to begin evacuation.

Once people are moving, familiarity and experience with the egress points of a structure have an impact on occupants' choice of evacuation route. Other factors include the physical shape of occupants, number of injured and age (the very young may need to be carried.) Although it is not always the most direct or safe choice, occupants typically exit a building in the same place they enter.



Detection and alarms, fire-resistance-rated floors, walls, stairwells and many other fire protection features keep buildings safe. Pyro-Stop, LLC Photo

The speed of movement can be calculated using speed of movement models in egress systems. Proulx continues that most of these equations do not take into account crowd composition and abilities, stress, fatigue and movement under smoke conditions.

Further, she goes on to state that movement calculations are usually over-optimistic compared to actual movement speed during fires because a number of dimensions interplay to reduce the speed of movement to leave the buildings.

Proulx goes on to summarize her findings with some very startling information.

Although adequate fire safety systems are often installed in buildings, failure of these systems to work as planned is regularly observed when an actual fire occurs. Problems frequently arise during fire incidents because systems were put in place with false expectations regarding how occupants actually behave during fires. It has been observed regularly that occupants have a tendency to ignore the sound of the fire alarm in large public buildings such as shopping centres, museums or airports, continuing their normal activities. In office buildings, well designed fire doors have failed to fulfill their role because occupants have installed door stops to facilitate free movement in the everyday use of the building; thus in the event of a fire the doors stay open. Occupants of apartment buildings sometimes tampered with the fire alarm sounders to silence them, if they feel they have to respond to too many false alarms. Many of these problems could be foreseen if there was more attention given to human behaviour in fire.



Throughout the world, safety is designed and engineered into buildings.
FCIA Photo

From the tone of this paragraph, the inference is that building engineering and human behavior in the use of structures still needs more research to understand actual movement times, and how society uses buildings during emergencies.

In addition to issues pertaining to evacuation, you must consider emergencies outside, where lockdown occurs, requiring occupants to remain in place. Can buildings defend themselves, and people for an adequate amount of time?

There will be those that say “show me the numbers...there are not enough emergency events to justify having fire-resistance-rated corridors for security, with walls extending above the ceiling tile to the next floor/roof assembly, fire doors, firestopping, fire dampers and fire-rated glazing in doors.” Yet, in the event that these fire protection features are needed and not there – or were there and did not work – there may be a public outcry.

Let’s look at that italic text again. Egress systems’ failure to work as planned, occupants not believing

fire alarms due to too many false alarms, fire doors left opened, occupant unfamiliarity with building layout other than the way they came in, and more.

Let’s analyze the statement “failure to work as planned.” What does that mean? After 9/11, research showed that high heels, overweight people, and the carrying of handicapped individuals resulted in slowed egress through stairwells. Were high heels built into the egress time?

Was the egress time and presence of a sprinkler system used to justify reducing the fire resistance time ratings required for the buildings in our society?

It seems Ms. Proulx was onto something. Further research about human behavior in buildings is needed for decision-making of building regulators. Education of building occupants can improve too.

The education doesn’t need to be a science class, but it should be enough to gain respect of the fire and smoke protection features in the building that help keep people safe. Why can’t it be taught to people that if there’s a label on a fire door, that the door shouldn’t be propped open? Why can’t it be taught that a fire door means the wall is fire-resistance-rated and all holes shall be firestopped? Education, fire drills, doors that were not locked from inside stairwells, and firefighter coordination for operations and evacuation all helped occupants escape the LaSalle Bank high rise fire in Chicago.

Why do people wait for someone to tell them whether or not to evacuate when an alarm goes off? Shouldn’t they just leave and wait for instructions to return? Why do people forget to reactivate the sprinkler systems in buildings after maintenance?

No matter the “why can’t” is, learning more about fire protection features in buildings could save lives.

Natalie Keith compiled this story from several of Ms. Proulx’ articles. Natalie has been part of Life Safety Digest staff since 2005. She can be reached at natkeith1@juno.com

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DIIM - Firestopping & Effective Compartmentation

Design, installation, Inspection, Maintenance (or management – DIIM), is the key to success with many components of the building. Each industry has its own version of how things get DIIM'd. Why DIIM? It's for improved reliability of the building element so it operates correctly when called upon.

For Firestop Systems, DIIM takes a different form than most other industries. The Firestop Contractors International Association has used standards to build the DIIM philosophy for this industry.

DIIM Components.

D – D is for Design. In firestopping, this takes several forms. First, there should be a professional specifying firestopping in Div. 07-84-00 of MasterFormat 2004, 2010, that's certified by CSI as a Certified Document Technologist, Certified Construction Specifier.

Second, systems need to be selected by a specialty firestop contractor to meet conditions on construction documents and in the field. For 'Systems', FCIA was successful getting that single word added to the International Code Council (ICC) International Building Code in the 2005 code development Cycle. Since our industry is driven by the 'system', from design to estimating, then installation instructions and as built documentation, it was a top priority to get the code communicating 'systems' to the construction industry.

I – I is for Installation. A good product, with due diligence performed during development, manufactured to exacting specifications, is a must to start with. However, a good product can become really messed up if installed by an unqualified contractor who installs firestopping as a sideline.

It might look easy, but installing firestopping is very technical. Firestop *systems* are selected from the UL, Intertek, FM Approvals or other testing laboratory directories, then installed to a zero tolerance protocol. FCIA worked with FM Approvals to develop the FM Approved Firestop Contractor Program, and Underwriters Laboratories on the UL Qualified Firestop Contractor Program which builds the zero tolerance culture at companies, top to bottom.

The FM 4991 and UL Qualified Firestop Contractor programs are in Master Specifications in the US, Canada, and the Middle East. FCIA's code proposal to the International Code Council was also almost accepted by the international Code Council in the 2009 building code cycle.

Additionally, FCIA's work developing the FCIA Firestop Containment Worker Education Program will bring an educated workforce to an already high quality FCIA Member Firestop Contractor. With focus on firestop systems...and all the components that make it work, this means the contractor company has the zero tolerance philosophy embedded deep into the company culture.

I – I is for Inspection. Specialty firestop contractors inspect their own work to be sure it is being installed properly during initial construction.

Should specification or code require, firestopping in buildings is inspected to ASTM E 2174 and / or ASTM E 2393 Standards for the inspection of installed penetration or joint firestopping. These standards were developed by FCIA Members with input from manufacturers, consultants and the task group at ASTM. The standards require either a minimum of 10% of each type of firestop system installed be viewed as the installer is working, or minimum 2% destructive testing. Building owners and managers seem to be purchasing the 2% destructive testing.

What qualifies someone to inspect firestopping? At FCIA, we believe that the inspector shall be as qualified as the installer. That means they pass the FM or UL Firestop Exam. IAS AC 291 Accreditation is also a great idea.

M – M is for Maintenance – Every good product once installed needs some kind of maintenance or management review. FCIA testified in support of the National Association of State Fire Marshals in 2005 to modify the International Fire Code 703.1 passage.

The paragraph states that all the features of effective compartmentation must be maintained in working order.

703.1 Maintenance.

Such elements shall be visually inspected by the owner annually, and properly repaired, restored or replaced when damaged, altered, breached or penetrated.

Where concealed, such elements shall not be required to be visually inspected by the owner unless the concealed space is accessible by the removal or movement of a panel, access door, ceiling tile, or similar moveable entry into the space.

Openings made therein for the passage of pipes, electrical conduit, wires, ducts, air transfer openings, and holes made for any reason shall be protected with approved methods capable of resisting the passage of smoke and fire.

Openings through fire-resistance rated assemblies shall be protected by self closing or automatic-closing doors of approved construction meeting the fire protection requirements for the assembly.

Why DIIM? With proper Design, Installation, Inspection and Maintenance, the installed firestop systems in buildings will perform as intended. When the firestop systems perform, the continuity of fire resistance rated construction is maintained and protects people and property in buildings, high rise and all other occupancies. With the DIIM concept used for all features of effective fire resistance rated compartmentation, fire and life safety are protected.

Visit <http://www.fcia.org> to find the best in firestop contractors, inspectors, manufacturers, distributors, manufacturers reps worldwide.

Life Safety Digest Staff 

Fire & Smoke Barrier Markings

By Valarie Loper

I am an electrician by trade and have been one since the 1980's. Before becoming a building official in 2001, I never knew the meaning of a fire-resistance-rated wall – let alone the application of one. Since then, I have learned not only the meaning but also the application of another set of codes.

In April 2009, I was asked to serve on the ICC Nevada Chapter fire life safety committee to formulate the 2009 Southern Nevada Local Amendments. It was a great learning experience and one where I was first introduced to a change taking place in the building code.



Specialty Firestop Contractors provide markings for many types of barriers.
C.L. Downey Construction Photo

The change had to do with the labeling of fire-rated walls and smoke partitions. I have grown ever so passionate about the integrity of fire-rated construction as an inspector. I remember being the one who would put holes in the walls I now found myself enforcing the integrity of. During the code development process at the International Code Council (ICC), I learned of Sean DeCrane's and Tony Crimi's proposals to 703.6 in the Building Code which would require rated walls to be marked with information stating the rating in an effort to maintain the original intent of the wall. This appeared in 703.6 of the 2009 International Building Code (IBC).

Wow, I thought this was a great, much needed requirement. I have spent the past 10 years in North Las Vegas trying to work with building owners and managers as they maintain the walls in buildings.

To improve the code requirement, I suggested a local change that would add just a little more restriction to the code by regulating the lettering, size, and spacing. As I worked on this at our local level, it was suggested that the concept be taken to a national level. Although

a little intimidated having never attempted to change something, I felt it was needed in the code.

The change I proposed was a success, not only on a local level but also in the national code.

It is written as 703.7 in the 2012 IBC that walls are required to have protective openings, and be identified with signs or stenciling. The proposal was FS7-09/10 703.6.

Marking and Identification. Fire walls, fire barriers, fire partitions, and smoke barriers, or any other wall required to have protective openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:

- 1. Be located in accessible concealed floor, floor-ceiling or attic spaces:*
- 2. Be located within 15 feet (4572mm) of the end of each wall and at intervals not exceeding 30 feet (9144mm) measured horizontally along the wall or partition; and*
- 3. Include lettering not less than 3 inches (76mm) in height (with a minimum 3/8 inch stroke) in a contrasting color incorporating the suggested wording. "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS" or other wording*

Exception: Walls in Group R-2 occupancies that do not have a removable decorative ceiling allowing access to the concealed space.

There was also an approved floor amendment at the code hearings in Baltimore in 2009 that included a 3/8-inch stroke to this new requirement.

The 2012 edition of the International Building Code has this requirement in Chapter 7, section 703.7.

As an electrician, I remembered all the times walls were penetrated with electrical installations and how we lacked critical information. This change in the code provides information that will be written on fire-resistive walls that the hourly rating of the resistive construction will be maintained.

To begin the lettering at 15 feet from an end wall would ensure that someone would always be within 15 feet of a label, aiding in the ability to see the information. The larger letter and the contrasting color will also make this requirement much more visible to the contractors and subcontractors that will be creating unprotected openings in protective assemblies to be informed of the requirement to protect these openings.

Plus, the markings will be a management tool for the building owner and manager. "Don't punch any holes



Painted stencils can mark walls and comply with code. Multicon photo

in marked walls without a fire barrier permit," can easily be communicated to contractors and their workforce. This can do nothing but help fire and smoke barrier management programs in buildings.

On more than one occasion, I have been told that if you think there needs to be a change in the code, then you should submit a code change proposal.

The whole code development process has allowed me to experience how the ICC Family of Codes change and grow and change some more over time. Although it seemed like a simple fix, the process helped the proposal evolve into a workable solution which results in safer buildings – of all occupancies including high rise - for everyone.

Valarie Loper is a Building Inspector for the City of North Las Vegas, NV. 🔥

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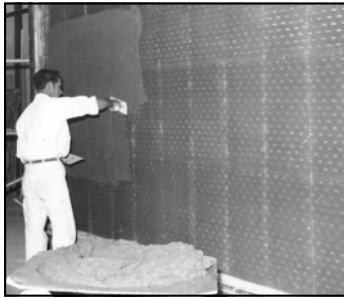
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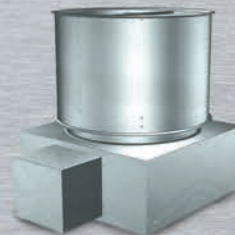
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Industry News

FCIA Firestop Industry Conference – FCIA’s new 2012 Board of Directors was elected. The new board consists of 2012 President **Jodi Clem**, Vice President **Tracy Smith**, Director **Scott Rankin**, Past President **Randy Bosscawen**, Director **Don Murphy**, Director **Eric Keeton**, Director **Ken Slama**, Director **Gary Hamilton**, and Past-President, **Bob Hasting**. Many thanks to FCIA Past President **Bill Hoos** for his years of service to the FCIA. Congrats to the new board.



Ken Slama, Gary Hamilton, Tracy Smith welcomed by incoming 2012 FCIA President Jodi Clem. FCIA Photo

FCIA’s Educational Programs, the Ray Usher Golf Tournament for the Bob LeClair Scholarship and the awards banquet helped FCIA celebrate another great year. Here’s the award highlights:



Jim Shriver, Thermafiber, Inc., Advocate of the Year Award recipient was one of the first manufacturer members at FCIA and has presented on Perimeter Fire Containment, written articles in Life Safety Digest, and provided input to the FCIA Firestop Manual of Practice. We’ll miss Jim as he retires at the end of 2011. Give him a call and wish him well!



Randy Bosscawen, Multicon Fire Containment, Inc., Award of Excellence recipient has served as Standards Co-Chair, and 2010 President, giving time and talent to the association that has been invaluable.

Eric Keeton, Dalton Maintenance, Inc., Outstanding Service Award recipient, the current Standards Co-Chair, has worked tirelessly to get answers for the industry about firestop sealant products shrinkage, has participated at ASTM, ASSE, and more. His leadership and class have been well received.



Eric Keeton & Bob Hasting
FCIA Photo

NEW NAICS Code for Firestopping – The North American Industry Classification (NAICS) US Government Committee obtained agreement from Mexico and Canada that existing system index items associated with the primary activities of firestop contractors be moved into Industry 23831, Drywall and Insulation Contractors.

This will help create a “Firestopping Trade” by now classifying the “firestopping work” in government contracts through this listing in the USA Federal Register.

FCIA in Abu Dhabi, UAE – FCIA had a great Firestop Education Program Oct. 16 in Abu Dhabi, UAE with over 100 attendees at the Yas Hotel. FCIA made new friends with the Department of Civil Defence, Municipal Affairs, FM Approvals, Underwriters Laboratories, Exova, and of course, FCIA members from the UAE and Qatar. Thanks to all who attended and sponsored.



FCIA Educational Seminar at Abu Dhabi’s The Yas Hotel. Shoeb Photo

At the FCIA Educational Program in Abu Dhabi, UAE, Butler Engineering-ME was presented with the IAS AC 291 Accreditation Certificate becoming the first FCIA Member Firestop Accredited Inspection Agency. Congrats to Sajid Raza and his staff for a great effort well rewarded.

FCIA at ASTM – FCIA led and attended fall meetings on ASTM E 2174 and ASTM E 2393, Credentials for Inspectors, and material performance. Of note was the scrapping of all research on simulated aging by the chair of that group. For service life expectancy of firestop products, it was recommended at the meeting that contractors, building owners and managers, architects request information from individual manufacturers.

Joint Commission Promotion – The Joint Commission’s **George Mills, FASHE, CHFM, CEM, CHSP, MBA**, was promoted to director of the newly formed Department of Engineering. The new department will bring together the organization’s experts in engineering and related disciplines.

Joint Commission Violations – FCIA 2012 President Jodi Clem, PREVENT, reports that George Mills presented the top 6 most cited standards violations for Q1/Q2 2011 at a California Society of Healthcare Engineers Program last summer.



Fire-resistance-rated construction was cited with penetrations and fire doors mentioned by name.

Top 6 Most Cited Standards by TJC in 2011		
46%	LS.02.01.10, EP 9 & 5	Penetrations & Rated Doors
44%	LS.02.01.20, EP 13	Corridor Clutter
37%	EC.02.03.05, All EP's	Fire Safety Testing
35%	LS.02.01.30, EP 2	Hazardous Areas
22%	EC.02.06.01, EP 1	Patient Safety
19%	EC.02.03.01, EP 1	Fire Safety

According to Clem, Mills stressed that managing barriers and maintaining fire wall integrity is the most important activity for hospital facilities managers to address. It was also recommended that fire door inspections every six months, if not more, for higher traffic doors as "basic door maintenance is falling below critical levels."

He also mentioned the importance of life safety documentation and its on-hand availability. No documentation means the work has not been done. Make sure to keep life safety documentation in a safe and accessible location, so that it's available when it's time for inspection. Mills also stressed the importance of deficiency resolution regarding life safety citations and issues. Facilities managers have 45 days to take corrective action.

DHI Foundation – The Door and Hardware Institute's Door Security and Safety Foundation focuses on awareness, education, research and outreach for swinging doors used in buildings.

They've collaborated with key stakeholders to promote safety and security in institutional, industrial and other occupancies. Visit doorsecuritysafety.org to find DHI educated fire door assembly inspectors, and much more.

IAS AC 415 Fire Door Inspection Progress – International Accreditation Services (IAS) and the Door and Hardware Institute have collaborated to build a new IAS Accreditation Criteria (AC) for performing inspections of fire door assemblies installed in the field.

Inspection Agencies complying with this criteria will have demonstrated that they have the personnel, organization, experience, knowledge and competence to inspect fire door assemblies installed in the field in accordance with NFPA 80's specified requirements. Visit <http://www.iasonline.org> for more info.

Rolling Steel Fire Door Installer Certification – Rolling fire doors protect the biggest opening in buildings. The Institute of Door Education & Accreditation (IDEA) is an independent, non-profit, 501c3 education foundation dedicated to serving the public interest by enhancing the professionalism and safety within the door systems industry. The program is supported by the Door Access Systems Manufacturers Association (DASMA) dasma.com, and the International Door Association (IDA), doors.org.

Fireproofing Contractors Accreditation Program – The NFCA announces an accredited contractor program for NFCA members who install Spray-Applied Fire Resistive Materials (SFRM) and/or Intumescent Fire Resistive Materials (IFRM). The purpose of this program is to set a standard that requires an educational effort on the contractor's part resulting in an improvement in application of industry products in accordance with agency product approvals and building code compliance. The heart of the program revolves around the contractor having at least one Designated Responsible Individual (DRI) in the contractor's organization. The DRI must have participated in a NFCA DRI training program and passed an examination of the learned knowledge.

In addition, the DRI must continue learning through yearly educational requirements. The contractor must have been in business applying industry products for two years, received training in application of manufacturer's products, and a member in good standing in the NFCA.

FCIA Firestopping Contractors & 3rd Party Accreditation – FCIA collaborated with FM Approvals to develop FM 4991 in 2000 and Underwriters Laboratories on the UL Qualified Firestop Contractor Program. Rather than "self certification," FCIA chose a robust management system audit by a third party in addition to an individual passing an exam. The person who successfully passes the FM 4991 or UL Firestop Exam become DRIs when appointed by an FM 4991 Approved or UL Qualified Contractor company. DRIs must complete continuing education to stay current on industry issues. Company audits by FM Approvals or UL Personnel are performed yearly.



Building owners and managers, general contractors and others receive installation services from a contractor company that has procedures that have been audit tested resulting in better installations. Statistics presented at FCIA conferences confirm that an FM 4991 or UL Qualified Firestop Contractor installs firestopping correctly over 90% of the time.

ICON Expo Joins the PRECAST Show – In 2012 and 2013, the Precast Show, the largest event specifically for the precast concrete industry, welcomes ICON EXPO, the tradeshow for producers and suppliers of concrete masonry and hardscape products and services.

The 2012 show will take place at the Orange County Convention Center, March 1-3 in Orlando, Florida and the 2013 show will take place at the Indiana Convention Center, Jan. 31-Feb. 2 in Indianapolis, IN. 🔥

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Code Corner

New ICC Code Development Cycle

The 2015 code development process for the International Code Council (ICC) launches this year. Similar to previous cycles, code change proposals will be heard by Committees divided by topic area. New and different for this cycle is breaking the ICC Codes into two cycles, with Group A and Group B Committees hearing the proposals in spring, and Final Action Hearings in the Fall.



Code Hearings involve industry representatives and government officials.
FCIA Photo

Group A proposals will be heard and concluded in 2012:

- IBC-Fire Safety – Chapters 7, 8, 9, 14, 26 and Appendix D.
- IBC-General – Chapters 2-6, 12, 13, 27-34, Appendices A, B, C, F, H, K
- IBC-Means of Egress – Chapters 10, 11 and Appendix E
- IBC-Structural – Chapters 15-25 and Appendix G, I, J, L, M
- International Fuel Gas Code
- International Mechanical Code
- International Plumbing Code
- International Private Sewage Disposal Code

Group B Proposals are heard and concluded in 2013:

- All Codes except IRC, IECC, Performance Code, Administrative
- International Energy Conservation Code
- International Existing Building Code
- International Fire Code
- International green Construction Code
- International Performance Code
- International Property Maintenance Code
- International Wildland-Urban Interface Code
- International Zoning Code
- International Residential Code

Although it looks easy, code change proposals that overlap disciplines may be heard during the previous year. For example, the IEBC structural provisions are heard in 2012, rather than 2013.

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The ICC has tons of info about the code development cycle at the code development section of ICCSAFE.org.

International Green Construction Code



After over 3 years of work, committee and final action hearings, the new IgCC Code Development Process is complete.

Although the IgCC will be published in March, there have been several jurisdictions that have adapted the document for either mandatory or voluntary use.

Concepts of the IgCC code are to drive 'sustainability' of buildings in addition to energy efficiency, recycling and reduction of chemicals in buildings. Sustainability means energy is not used to remove and replace products in buildings. Insulation values for many items increase with the code.

There were several proposals that dealt with Chapter 3 & 5. Many industries will have to deal with this issue. And, the project site is not immune either in new construction and renovation. Contractors will need to develop efficient purchasing and installation procedures to meet these requirements.

Although it looked like this may have been defeated, the Building Service Life Plan actually was moved to an appendix. In this requirement, materials in concealed spaces, such as firestopping, must have a minimum service life of 25 years. Optionally, the requirement could increase in years.

At this point, the code does not define 'concealed'. Concealed could be interpreted as anything above removable ceiling tiles. Plus, the minimum service provisions in the code provide no exclusions like there would be in a contractor or manufacturer long term warranty. Plus, the architect is in this liability loop as well as the designer. Although a great concept, there will need to be more clarification needed about this issue for the construction and renovation industry to comply with IgCC requirements.

FCIA's Standards Committee did speak to the building service life plan issue and firestopping.

"We support the long building service life, and challenge the standards development organizations and manufacturers to come up with meaningful standards, that determine suitability for use of products in applications that can be reasonably expected to occur in the field."

The IgCC is going to be adopted by jurisdictions and architects, specifiers, contractors and their supply chain will have to comply. Industries do have time to prepare for this new IgCC once published, in March. Watch for

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more analysis after we see the finished code in March.

NFPA Code Development Cycle

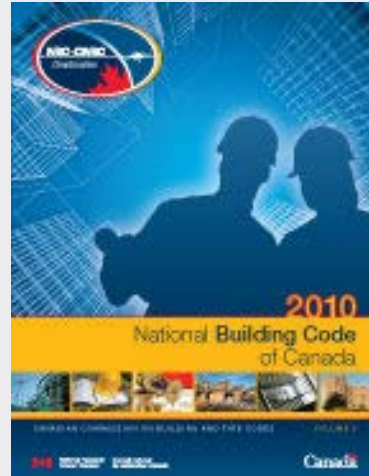
NFPA's 2014 5000 Building and 101 Life Safety Code development meetings take place in 2012. Committees meet in May and August in both 2012 and 2013 to review proposals and comments. NFPA is using a new and improved cycle. 'Public Input' (PI) is now used as a new term for 'Proposal' that starts the process. Visit <http://www.NFPA.org/Regs> for complete info about the new process, forms and procedures.

UAE Abu Dhabi National Building Code

This code is managed by the Department of Municipal Affairs through technical committees from government departments, academia, consulting firms, oil industry and major developers in Abu Dhabi Emirate. FCIA offers educational seminars in the UAE to the Departments of Civil Defence and Municipal Affairs to have meaningful dialogue about building and fire codes in the UAE.

Canadian National Building Code

The Canadian National Building Code is managed by the Canadian Commission on Building and Fire Codes, through standing committee and task group meetings. These meetings are open to the public. Comments were due for proposals that committees hear in December, 2011. The Standing Committee on Fire Protection meets May 14 & 15, in Vancouver. 🔥



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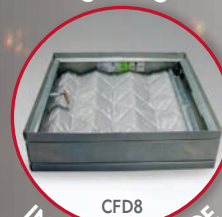
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2012 Industry Calendar

Jan. 23 to 27

World of Concrete, Las Vegas

March 1 to 3

The PRECAST Show Featuring
ICON, NCMA, ICPI Annual
Meetings, Orlando

March 20 to 23

National Fireproofing Contractors
Association Education Conference,
Las Vegas

April 15 to 19

INTEX Convention & Trade Show,
Charlotte

April 15 to 18

ASTM E-06 Performance of
Buildings Meetings, Phoenix

April 24 to 27

FCIA Education and Committee
Action Committee Conference,
Las Vegas

April 29 to May 6

ICC Code Development Hearings,
Group A Codes, Dallas

June 11 to 14

NFPA Conference & Expo,
Las Vegas

June 24 to 27

ASTM E-05 Fire Standards
Meetings, San Diego

Sept. 12 to 14

CONSTRUCT & CSI Annual
Convention 2012, Phoenix

Oct. 15 to 16

Society of Fire Protection Engineers
Annual Meeting, Professional
Development Conference,
Savannah, GA

Oct. 21 to Oct. 28

ICC Annual Conference &
International Code Council Group
A Final Action Hearings
Portland, OR

Nov. 6 to 9

FCIA Firestop Industry Conference
& Trade Show

Dec. 2 to 5

ASTM E-05 Fire Standards
Meetings, Atlanta



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