

THE MAGAZINE OF EFFECTIVE COMPARTMENTATION

Life Safety

DIGEST

SUMMER 2016

Reinventing Stairways Using Fire-Rated Glass

Why the Life Safety Code?

CMS Adopts The 2012 Edition
of NFPA® 101®

Hospital Work and Infection
Control—What's the Risk?

Decoded: Delayed Egress vs.
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LIFE SAFETY DIGEST

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ON THE COVER:

San Francisco Public Utilities Commission Office Building, San Francisco, CA. KMD Architects. Progress Glass-Glazier. 2-hour Stairwell using SuperLite II-XL 120 in GPX Architectural Series Walls and Super Lite II-XL90 in GPX Builders Series Temperature Rise Doors. Photo provided courtesy of SAFIT FIRST.

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F CIA has been actively involved in developing relationships and working with key Healthcare Facility Organizations over the past several years. FCIA's work with The Joint Commission (TJC), the American Society for Healthcare Engineering (ASHE) and Underwriters Laboratories (UL) on the development and implementation of the Barrier Management Symposiums have produced reductions in the number of violations found by surveyors from TJC. In fact, at recent events, George Mills of The Joint Commission has been heard saying, "Education works."

We at FCIA agree with that assessment. Education is critical, and it does work.

Attend any FCIA event and you will undoubtedly hear from TJC, the Healthcare Facility Accreditation Program (HFAP) or DNV-GL Healthcare engineers as they engage members to educate them to work towards safer buildings through firestopping and effective compartmentation. We coordinate to organize and produce the Barrier Management Symposiums, as well as speak at various trade shows like NFPA's Expo, the Canadian Healthcare Engineering Society's (CHES) Ontario Chapter Conference, ASHE's Annual Conference and Expo and Construction Specifications Institute/Construction Specifications Canada (CSI/CSC) events to do one thing . . . bring improved installed life-safety systems to building occupants worldwide.

So, with this issue of *Life Safety Digest* we educate on Healthcare facilities and their concerns and challenges. In this issue, check out several articles that are healthcare related—like the one from TJC's Anne Guglielmo who writes on contractors and infection control. Brad Keyes, Keyes Life Safety, reports on the history of fire events that have led to current code requirements. And, Lori Greene's article covers door hardware and access controls. But that's not where it ends.

Hospital and healthcare buildings have special needs due to the patients who occupy the structures. They can't move fast vertically, and so they must evacuate horizontally and invariably "defend in place."

We are proud to work with key leaders in healthcare to build a better, safer environment for their patient occupants. We also salute the designers, specifiers, contractors, facility engineering managers and regulators/accreditors who work diligently for one thing—patient safety.

It's true what they say: Together Everyone Achieves More. As we continue to work together to educate, implement and maintain the lessons learned, then global life-safety improvement is within reach. 🔥

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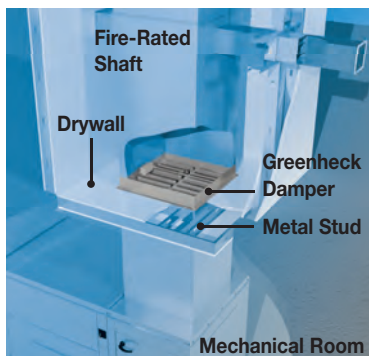


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WHY THE LIFE SAFETY CODE?

Why do we need the Life Safety Code? This is a question that is frequently asked by individuals who do not understand what all the fuss is about regarding compliance with a Life Safety Code when the nation hasn't had a fatality in a hospital due to fire in a long time. The answer to that question is simple: without the Life Safety Code our hospitals would return to a condition where tragic results occur as a result of fires and other emergencies.

It wasn't until 1970 that a national organization adopted the NFPA 101 Life Safety Code and required hospitals to be in compliance with it. The Health Care Financing Administration (HCFA), the forerunner of the Centers for Medicare & Medicaid Services (CMS) chose the Life Safety Code over other codes and standards because it addresses the building and staff preparedness to cope with fires and emergencies. Prior to HCFA adopting the Life Safety Code, compliance with it was only regulated on a local or state level, and in many situations, compliance with the Life Safety Code was only a recommendation, not a requirement. As a result, there were significant losses of life due to fires in hospitals prior to this time period.

CLEVELAND CLINIC, CLEVELAND, OH

In May, 1929, a fire in a lower level storage area which contained nitrocellulose X-ray film killed more than 120 people, mainly due to the toxic and explosive gas which was a result of the combustion of the film. There were no sprinklers in the storage area and unsealed openings between the floors allowed the toxic and explosive gas to travel upward.

SAINT ANTHONY HOSPITAL, EFFINGHAM, IL

In April, 1949, at least 74 people died in this 100-bed hospital located in the small rural community in central Illinois. The fire apparently started in the lower level where the laundry chute discharged the soiled linens, and spread upward via the open chute and through the building. The

building was constructed with combustible materials, and did not have any smoke compartment barriers, nor any smoke detection or fire suppression systems.

ST. ELIZABETH'S MERCY HOSPITAL, DAVENPORT, IA

41 people lost their lives in a 1950 fire caused by a deranged patient in the female psychopathic hospital. The windows were barred and the doors were locked and staff was unable to quickly evacuate the patients. The building was constructed with combustible materials and was not equipped with sprinklers or other fire-safety measures.

HARTFORD HOSPITAL, HARTFORD, CT

In December, 1961, 16 people died as a result of a fire that started in the trash chute at the Hartford Hospital. While the building was constructed with non-combustible materials, it had interior finishes which were combustible. When the fire erupted through the chute door on the 9th floor, combustible ceiling tiles, wall coverings and flooring ignited, trapping many patients and staff in dead-end corridors. Sprinklers were present in other areas of the hospital, but not on the 9th floor where all the victims were located.

Starting in 1970, all hospitals receiving Medicare reimbursement were required to comply with the Life Safety Code, which meant that deaths in hospitals began to diminish, but were not eliminated all-together.

SAC-OSAGE HOSPITAL, OSCEOLA, MO

In December, 1974, 8 patients died as a result of a fire at the SAC-Osage Hospital—6 died of smoke inhalation and 2 died when a supply valve to their oxygen tent was inadvertently shut off. The facility was only 5 years old at the time, and it was constructed to federal and state fire prevention codes in effect at the time. The fire was thought to have started from smoking materials igniting combustibles in a patient's room.

HOSPICE OF SOUTHEASTERN MICHIGAN

In December 1985, a fire that started in a recliner in a patient's room led to the death of 8 people in this hospice facility. All of the fatalities were in rooms where the doors to these rooms had not been fully closed and latched. Smoke spread through the bathroom ventilation system from room to room.

RIVERSIDE GENERAL HOSPITAL, RIVERSIDE, CA

In November 1986, 5 patients died in the Riverside General Hospital after a fire started in a patient room and spread out into the corridor. According to reports, the patient was smoking in his room and attempted to shut off his oxygen supply, but failed. Evacuation of the patients in the area of fire was not able to be completed due to heavy smoke from the fire.

MAIMONIDES MEDICAL CENTER, BROOKLYN, NY

3 patients died in a fire in September 1993 at the Maimonides Medical Center in Brooklyn, NY. According to a newspaper article, the fire started with a faulty respirator supplying oxygen to an elderly patient. The article said that hospital engineers had worked on the respirator hours before the fire after nurses and other workers complained that it was giving electrical shocks. Investigators said that an electrical fault in the machine caused the fire, which was fueled by pure oxygen, and created a blast so fierce that witnesses said it sent a fireball through the 7th floor hospital window.

SOUTHSIDE REGIONAL MEDICAL CENTER, PETERSBURG, VA

On December 31, 1994, a fire that started in a patient's room in the Southside Regional Medical Center in Petersburg, VA, resulted in the deaths of 5 patients. The fire apparently was started by smoking materials, which spread to bedding linens and the mattress. Smoke spread into the corridor because the door to the room of origin was left open. According to reports, the fire alarm transmission to the fire department was delayed because the connection was taken out of service at the time of the fire. The room and the corridor were not protected with sprinklers.

Great progress has been made over the years on fire safety in hospitals. In the five-year span from 1980 to 1984, fire departments in the United States responded to an estimated 7,100 hospital fires **annually**, resulting in an average of 5 deaths per year. In a similar time span between 2006 and 2010, US fire departments responded to an average of only 1,400 hospital fires per year that resulted in less than 1 death per year. The significant change in this statistic is attributed to the implementation of smoking bans in hospitals. From 1980 to 1984, 35% of the fires were started by smoking

materials, as compared to only 7% of the fires starting from smoking materials during the period from 2006 to 2010. During this same time period, 60% of the fires were started by cooking equipment.

Interestingly, sprinklers were present in less than half of the reported fires in hospitals from 1980 to 1984, while such fire suppression equipment was noted in 79% of the reported fires during the time period 2006 to 2010. During this same time period, damage from fire was limited to the room of origin in 97% of the reported fires.

Another method that can be used to minimize the spread of fire is by using fire-resistance-rated and smoke-resistant effective compartmentation in buildings, otherwise known as Passive Fire Protection Systems. Compartmentation is the fire-resistance-rated walls and floor, including the supporting structure, plus all of the compartmentation features that complete the assembly. The features of effective compartmentation that keep continuity of the fire-resistance where breaches occur include Firestopping, Fire and Smoke Dampers, Fire-Rated Glazing, Fire Swinging Doors & Hardware and Fire Rolling Doors.

One of the most comprehensive ways to minimize the spread of fire in buildings is with the use—and maintenance—of a Total Fire Protection program. All pieces—alarms and detection, fire- and smoke-resistance-rated effective compartmentation, suppression systems and occupant education—are needed to keep buildings and their occupants safe.

It's true that fires will continue to occur in healthcare facilities, and we will continue to need to be prepared for them. While smoking bans have cut down the number of fires started by careless use of smoking materials, it hasn't eliminated them. In fact, most healthcare professionals will admit that patients are still sneaking cigarettes without the staff's knowledge. Combine this with the presence of heat producing devices in and around high oxygen environments (such as cauterizing pens in surgery), and it's not a stretch to know that hospital fires will continue to happen.

The lesson we have learned, though, is the Life Safety Code saves lives. When combined with a variety of fire-safety features, such as early fire detection, sprinklers and firestopping, along with a capable, trained staff on fire response procedures, our hospitals are safer today than they have ever been. But, we still average 3.8 fires per day in hospitals in the United States. We need to be prepared and ready to face that situation when it occurs. Without the Life Safety Code, there is no doubt there would be far more tragic results than there are today. 🔥

Brad Keyes is principal at Keyes Life Safety Compliance. This article has been adapted from www.keyeslifesafety.com

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CMS ADOPTS THE 2012 EDITION OF NFPA® 101®

On May 4, 2016 the Centers for Medicare and Medicaid Services (CMS) published the Final Rulemaking adopting the 2012 Edition of the *Life Safety Code*®. In addition, CMS also adopted the 2012 Edition of NFPA 99, *Health Care Facilities Code*, for the first time. In the past, portions of NFPA 99 were required as referenced in *NFPA 101*. As published, the new requirements are effective July 5, 2016. However, there is some discussion that the effective date may be extended somewhere between 60 and 180 days. What does this mean for those interested and involved in passive fire protection features in a health care facility?

ANNUAL INSPECTIONS OF ALL FIRE DOORS

In the past, by reference to NFPA 80 only certain fire doors were required to be inspected and tested annually. However, the 2010 Edition of NFPA 80 (which is the edition referenced by *NFPA 101-2012 Edition*) requires that all fire doors be inspected on an annual basis (NFPA 80-2010 Edition: 5.2.1). The requirement in *NFPA 101* can be found in paragraph 4.6.12.1 which requires that all required features be maintained in accordance with the applicable NFPA standards. The inspections need to be performed by qualified individuals and records need to be maintained by the owner and made available to the authority having jurisdiction, upon request. While Certified Door Inspectors may perform this service, NFPA 80 does not require that the individual hold such credentials.

Speaking about fire doors, there is also a new requirement that glazed vision panels in new wood doors must be installed in listed glass light kits or in accordance with the door manufacturer's listing and the glazing must be installed under label service (NFPA 80-2010 Edition: 4.4.3.1). The clearance requirements under a fire door have been simplified such that the

maximum permitted clearance is $\frac{3}{4}$ inch for almost all fire doors, regardless of the floor covering (NFPA 80-2010 Edition: 4.8.4).

FIRE-RATED GLAZING

As compared to the 2000 Edition of *NFPA 101*, the 2012 Edition requires a specific labeling system for fire-protection-rated and fire-resistance-rated glazing. The purpose of the new label requirements is to properly identify the fire test used to evaluate the glass. Glass can be tested as part of a wall (fire-resistance-rating), as part of a fire door assembly or as fire window. The label will clearly identify which test(s) was performed. The table that identifies the required performance (duration and type of rating) has been expanded to identify the label information that should be provided on new glass in the various applications where a wall has a fire-resistance-rating (NFPA 101-2012: 8.3.3 and 8.3.4).

FIRE-RESISTIVE JOINT SYSTEMS

The 2000 Edition of *NFPA 101* was silent on the issue of fire-resistive joint systems. The 2012 Edition requires that the joints in between and at the perimeter of fire barriers, the floor or roof deck above or the outside walls shall be protected with fire-resistive joint systems in new construction. Existing materials and methods of construction used to protect existing joints shall be considered acceptable. The joint system shall also be capable of limiting the spread of smoke (NFPA 101-2012: 8.3.6).

ON-SITE INSPECTIONS

While in an Annex note and therefore not a mandatory requirement, NFPA 101-2012 does mention the importance of maintaining the integrity of fire barriers. The Annex note continues by referring to ASTM E 2393, *Standard Practice for*

On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers (NFPA 101-2012: A.8.3.6.5). A separate Annex note references ASTM E 2174, *Standard Practice for On-Site Inspection of Installed Fire Stops*, for listed through-penetration firestop systems (NFPA 101-2012: A.8.3.5.1).

PATIENT SLEEPING SUITES

The maximum area of a suite containing patient sleeping rooms has been increased from 5,000 sq. ft. to 10,000 sq. ft., provided additional protection features are provided. In order to have a 10,000 square foot suite, the smoke compartment containing the suite must be protected with fast response sprinklers. Additionally, the suite must be protected with complete smoke detection, and direct visual supervision of the sleeping rooms shall be provided from a normally occupied area. The travel distance to an exit access door from the suite continues to be restricted to 100 feet (NFPA 101-2012 Edition: 18/19.2.5.7.2). The Code also now specifically permits egress to an adjoining suite (NFPA 101-2012 Edition: 18/19.2.5.7.2.2).

EXISTING BUILDINGS

While not a new requirement, it should be noted that buildings that were considered new construction under the 2000 Edition will now be an existing building under the 2012 Edition. That does not mean, however, that the level of protection that currently exists in these buildings may be reduced to that which is required for existing health care occupancies. To the contrary, in fact. *NFPA 101* specifically states that existing life safety features may only be diminished to that which is required for a new health care occupancy (NFPA 101-2012: 4.6.7.4).

This requirement is often overlooked. Recently I was asked if a 96,000 square foot floor in a health care occupancy could be all one smoke compartment. While there are operational considerations to be addressed if it is permitted, I inquired as to whether there ever were any smoke barriers on the floor. Upon further research, it was determined that the building was built with several smoke compartments on the floor. Unfortunately, though, someone applied the Chapter 19 provisions and allowed the smoke barriers to be eliminated. Existing smoke barriers might be able to be eliminated, but only if the resulting condition meets the requirements for smoke compartments for new health care occupancies.

Chapter 43 is a new Chapter as compared to the 2000 Edition of *NFPA 101*. The chapter addresses all work or changes that occur in an existing building. The level of work (referred to as category of work in the Code) can range from a repair to adding an addition on to an existing building. The origin of Chapter 43 is what has been referred to as rehabilitation codes that were adopted in some states such as Maryland, New Jersey, New York and Rhode Island. The overall intent of the chapter is to encourage the reuse or continued use of existing buildings. Whenever any construction activity, change in the use of space or change in occupancy classification occurs in an existing building, one needs to refer to Chapter 43. The chapter provides a “road map” as to how the requirements of the Code are to be applied to the work or change being made, based upon the category of the work.

SUMMARY

The long anticipated adoption of the 2012 Edition of *NFPA 101* by CMS has finally happened. Most likely no interested party will be happy with all of the changes that have occurred since the 2000 Edition; however, most likely all parties will agree that using the 2012 Edition will be an improvement over using a much older edition of the Code and all the reference standards. Sure, there will be health care facilities that will need to address items that are not permitted by the 2012 Edition, but there will also be health care facilities that will benefit from some of the additional compliance options offered in the 2012 Edition. Most importantly, using and adopting updated codes and standards helps to ensure patient and occupant safety. Most people would agree that the use of more current editions of a Code benefit all interested parties overall. 🔥

Bill Koffel is President of Koffel Associates, a fire protection and life safety engineering design and consulting firm. Bill remains active in the development process of the industry's governing codes, standards and design guidelines including International Code Council (ICC), NFPA, Society of Fire Protection Engineers (SFPE) and Underwriters Laboratory (UL). Bill can be reached at wkoffel@koffel.com

UNLIMITED?

Not when it comes to fire rated glass

Beware of advertisements urging designers to 'be unlimited' when using ceramics with 'fire ratings up to 3 hours.' The problem is that while ceramics are listed up to 3 hours, the IBC specifically limits its size and applications after 45 minutes. The code limits the use of ceramics to 100. sq. inches in 60/90/180 minute doors and ceramics cannot be used at all in 60/120 minute interior windows, sidelites and transoms regardless of whether sprinklers are employed or not.

For truly unlimited glazing, fire resistive products tested to ASTM E-119 like **SuperLite II^{XL}** must be used. **SuperLite II^{XL}** can be used up to the maximum size tested in all fire rated applications.

Here's a side by side comparison of fire protective vs. fire resistive glazing used in a 1-hour stairwell application:

Ceramics (Fire Protective)



Filmed or Laminated Ceramic in a 60 minute temperature rise door limited to 100 square inches

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SuperLite II-XL 60 in a 60 minute temperature door over 100 square inches. The sidelites and transoms also use SuperLite II-XL 60 in GPX Architectural Series Framing

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HOSPITAL WORK AND INFECTION CONTROL

What's the Risk?

A good barrier management program is one of the keys to effectively maintaining required compartmentation in healthcare buildings. Organizations that have a program in place to routinely assess the conditions of the building fire and smoke barriers are able to determine necessary corrective actions for identified deficiencies and implement appropriate repairs that maintain the integrity of the fire- and smoke-resistive assemblies, resulting in being able to provide a safer patient care environment.

But what about the risks associated with performing repair work in occupied patient care areas or patient support spaces?

WHERE ARE THE RISKS FOUND?

Thousands of deaths each year are contributed to healthcare associated infections in hospitals today. Airborne fungal spores, such as aspergillus, fusarium and penicillium are released during construction. Pathogens are found in many common places such as the air we breathe, the water we drink, HVAC systems conditioning the spaces we occupy and surfaces we touch every day. There are serious risks that can be introduced in the patient care environment when ceiling tiles are moved or removed, dry wall is cut into and assemblies are repaired.

Project work taking place in the hospital setting can exasperate the problems these pathogens cause. Having these activities close to patients that are susceptible to infections requires extra care and forethought to keep the patient care environment safe. Proactive risk assessments are a crucial part of all hospital project work.

COMPONENTS OF A RISK ASSESSMENT

When a hospital is planning demolition, construction, renovation or major repair, a preconstruction risk assessment (PCRA) is required to be completed as part of the planning phase of the project. Preconstruction

risk assessments consider the impacts and effects of air quality, infection control, utilities, noise, vibration and any other hazards that can impact patient care, treatment or service. Once project work begins and project phases turn over, the assessments completed during the planning phase need to be reviewed and updated as necessary as the project progresses.

Included as a part of the preconstruction risk assessment process, hospitals are required to complete an infection control risk assessment (ICRA) to determine what specific infection control risks there are to the environment in which the project is taking place. There is no one required ICRA form that should be used, however there are several resources available in the industry. These resources include, but are not limited to, the American Society for Healthcare Engineering (ASHE), the ECRI Institute and the Association for Professional in Infection Control and Epidemiology (APIC).

COMPLETING A RISK ASSESSMENT

The first step in completing ICRA's for construction and renovation/repair projects is to classify the work being done based on scope. Whether it is a small scale project like painting and trim work or raising ceiling tiles for visual inspection only or small scale quick turn-around activities with minimal dust creation, moderate demolition and installation with moderate to high dust production or major demolition and new construction activities with long durations, scoping the project sets the ground work for the assessment.

The second step is to identify the patient risk group affected by the project work. This step of the analysis process considers what area of the hospital the work will be done in and what patients will be affected by the work. Areas from general offices to Radiology, the Emergency Department up through Oncology are

assessed for risk classifications of Lowest to Highest. The risk group determined in this process will be reviewed against the work scope.

MITIGATION STRATEGIES

There are a number of accepted Infection Control practices that are implemented both during project work and once work has been completed. These activities are put into classes, and then ICRA matrices are referred to in order to compare the Patient Risk Group identified with the Construction Project Type identified to determine what practices should be used and when. It is important to note that the parameters of the matrix that is being used and organization policy will determine when and to what extent the organization's Infection Control professional must approve assessments and outcomes.

Infection Control activities that may be required can include:

- dust mitigation strategies;
- ceiling tile inspection activities;
- sealing of doors and air vents;
- use of dust mats;
- covered container use for waste transport;
- wet mop and/or vacuum activities within project space;
- HVAC system isolation (to varying degrees based on project work);
- construction of barriers (sheetrock, plywood, plastic, etc.);
- negative pressure;
- specific attire worn by all workers within the project area;
- and others.

The specific activities required are based on the Class determined and may vary throughout the life of the project work.

CONTRACTOR AWARENESS

Being aware of what is required of contractors working on specific projects is crucial to successful implementation of sound Infection Control practices to protect patients.

In addition to the project work area, careful analysis and consideration of the surrounding areas to determine if there are any potential impacts outside of the specific project site location must be done. This will allow for implementation of control measures that are unseen to the specific work area but can have significant impact to patient safety.

The rest of the assessment should look at the specifics of the project that is being assessed. Consideration needs to be given to areas of project work (patient rooms, medication areas, labs, etc.), utilities impacts, containments measures (barriers, filtration, vestibules), housekeeping activities, work hours and staff interactions.

CONTAINMENT

As contractors, the sensitivity of the area the project is taking place in isn't always obvious. The hospital needs to identify those issues and incorporate them into the training provided to workers in these areas.

Identification of utilities impacts is another important consideration. Outages caused by the project work can have severe impacts on staff's ability to deliver patient care safely.

But one of the most important factors to consider is containment requirements for the project area. Insuring the right barrier is installed and maintained throughout the life of the project has significant impact on the safety of the patient care environment. Making sure that contractors are working in approved areas only, limiting travel through active patient care areas with project supplies, materials and waste and insuring mitigation activities like wearing required attire, sealing the area upon departure and confirming air flows prior to start of work are steps all contractors should make a habit of on all project sites.

FINAL THOUGHTS

Contractors working in healthcare environments need to be made aware of the role that they play in contributing to, as well as preventing, risks to the environment. Contractor training prior to beginning any new project work is a must. Understanding the risks determined by the organization as a part of the planning process helps workers to adjust their activities to reduce the inherent risks to the patient care environment.

Contractors should be receiving on-site orientation and training prior to starting all project work in the hospital setting. If hospital contractor orientation does not include PCRA and ICRA—ask for it. Communication is the key to successful projects in all aspects—but especially to patient safety.

It is also important to understand what the process is for reporting issues of non-compliance with Infection Control practices. Work completed in areas that did not have the proper containment, work completed where barriers were breached or work completed in areas without the proper pressure differential, for example, need to be reported to facilities and infection prevention staff as soon as possible. It is impossible to know what Infection Control practices have not been adhered to when the expectations of the contractor have not been discussed and trained.

Working together as an integrated project team—facilities, infection prevention and contractors can not only improve and maintain the patient care environment, but make it safer and reduce negative patient outcomes. 🔥

Anne Guglielmo, CFPS, CHFM, CHSP, LEED A.P., is an Engineer at The Joint Commission in Oakbrook Terrace, IL. She serves as one of the five engineers providing support for the Life Safety, Environment of Care and Emergency Management standards. She is a member of NFPA, ASHE, SFPE, ICC and the Technical Committee for NFPA 80, 101 and 101A. She can be reached at aguglielmo@jointcommission.org.

Decoded: DELAYED EGRESS VS. CONTROLLED EGRESS

Prior to the 2009 editions of the International Building Code (IBC) and NFPA 101–*The Life Safety Code*, health care facilities with a need to contain patients for their safety did not have a lot of options. Although there was some leeway with locking requirements for psychiatric facilities, security needs in other types of health care units, such as memory care, maternity, pediatrics, and emergency rooms were not specifically addressed by the model codes. For these areas, delayed egress locks or alarms could be installed, but they weren't always enough to deter patients or visitors from using the doors. This put the patients at risk of elopement, or in the case of infants and children—possible abduction.

The 2009 edition of the IBC added a section called *Special Locking Arrangements in Group I-2* (1008.1.9.6), which described a fail-safe lock that would be released in an emergency to allow egress, but the code section used the terminology “delayed egress lock” even though the code did not require the product that is commonly known by that name in the door and hardware / security industry. The 2012 edition of the IBC corrected the terminology by changing “delayed egress lock” to “special egress lock” (1008.1.9.6) which helped to clarify that the intent of this section was not to require a delayed egress lock which would release after 15 seconds.

In the 2015 edition of the IBC, the terminology was changed once again (hopefully for the last time) to “controlled egress lock” (1010.1.9.6).

The 2015 edition also expanded this section to apply to Group I-1 (alcohol and drug centers, assisted living facilities, congregate care facilities, group homes, halfway houses, residential board and care facilities, and social rehabilitation facilities) as well as Group I-2 (foster care facilities, detoxification facilities, hospitals, nursing homes, and psychiatric hospitals). Within these facilities, the IBC allows controlled egress locks to be used where the patients' clinical needs require their containment and all of the other requirements are met.

The changes over these three editions of the IBC have caused some confusion regarding delayed egress vs. controlled egress. While a controlled egress device



Controlled Egress Pair
Photo courtesy of Lori Greene



Delayed Egress Pair
Photo courtesy of Lori Greene

allows the egress doors serving certain areas to remain locked until they are unlocked by staff, the automatic fire protection system, or a power failure, delayed egress locks must automatically unlock 15 seconds after a building occupant actuates the device by pressing on the touchpad or the door, along with other emergency egress requirements. The section of the IBC addressing controlled egress in certain areas of a health care facility does not require the door to release automatically after a building occupant attempts to exit by pushing or pulling on the door or hardware.

The IBC does not specifically state which types of health care units can be equipped with controlled egress locks but the 2015 IBC Commentary states: “The areas where controlled egress may be permitted include psychiatric areas, dementia units, Alzheimer’s units, maternity units, and newborn nurseries. Code officials may also permit these provisions in other areas such as emergency departments or pediatric areas where the safety and/or security of the occupants are of primary concern.” This helps to establish the intent of section 1010.1.9.6, but the Authority Having Jurisdiction (AHJ) may provide additional guidance.

Beginning with the 2009 edition, NFPA 101 includes similar controlled egress requirements in Chapter 18–*New Health Care Occupancies*, and Chapter 19–*Existing Health Care Occupancies*. Chapter 7 of NFPA 101 also includes a section addressing delayed egress. There are variations between the model codes with regard to these two applications, and the table which follows compares each of the criteria for both delayed egress and controlled egress systems. If these requirements are carefully followed and the appropriate system is installed as allowed by the code adopted in the project’s jurisdiction, patient security will be enhanced without jeopardizing life safety. 🔥

Lori Greene, DAHC/CDC, FDAI, CCPR, is Manager, Codes & Resources for Allegion and has worked in the door and hardware industry for 30 years. She uses her website—iDigHardware.com to provide information about the code requirements related to door openings. Visit iDigHardware.com/guide to download a free 40-page code reference guide which covers fire, life safety, and accessibility code requirements for doors and hardware.

	2015 International Building Code		2015 NFPA 101 - The Life Safety Code	
	Delayed Egress	Controlled Egress	Delayed Egress	Controlled Egress
Code Section	1010.1.9.7 - Delayed Egress	1010.1.9.6 Controlled egress doors in Groups I-1 and I-2	7.2.1.6.1 - Delayed Egress Locking Systems	18.2.2.2.5 (New Health Care) 19.2.2.2.5 (Existing Health Care) Also refer to 20.1.3.6 (New Ambulatory Health Care) and 21.1.3.6 (Existing Ambulatory Health Care)
Use Groups Where Application is Allowed	Any Use Group except Assembly, Educational, or High Hazard	Only allowed in Use Groups I-1 (<i>alcohol and drug centers, assisted living facilities, congregate care facilities, group homes, halfway houses, residential board and care facilities, social rehabilitation facilities</i>) and I-2 (<i>foster care facilities, detoxification facilities, hospitals, nursing homes, psychiatric hospitals</i>) - where the clinical needs of persons receiving care require their containment (<i>examples in the IBC Commentary include psychiatric areas, dementia units, Alzheimer's units, maternity units, newborn nurseries, and possibly emergency departments or pediatric areas depending on AHJ preference</i>). Prior to the 2015 edition, this section was limited to Use Group I-2.	Doors serving low- and ordinary-hazard contents in the following new and existing occupancies: Assembly - permitted except on main entrance/exit doors; exception: in airport terminals, delayed egress locks are not permitted on doors in the egress path from the aircraft through the airport loading walkway into the airport terminal building Educational, Day-Care, Health Care, Ambulatory Health Care, Hotels and Dormitories, Apartment Buildings, Mercantile, Business, Industrial, Storage - permitted with no restrictions Lodging or Rooming Houses - limited to one delayed egress device per escape path Residential Board and Care - limited to exterior doors only	New and Existing Health Care Occupancies - where patient special needs require specialized protective measures for their safety (<i>examples in Annex A include pediatric units, maternity units, and emergency departments</i>), all of the requirements below must be met including automatic release. Where the clinical needs of patients require specialized security measures (<i>examples in Annex A include psychiatric, Alzheimer's and dementia units where patients are housed in specialized units</i>) or where patients pose a security threat (<i>examples in Annex A include forensic and detention units</i>), staff must be able to readily unlock doors at all times, but automatic release is not required. Also refer to 20.1.3.6 (New Ambulatory Health Care) and 21.1.3.6 (Existing Ambulatory Health Care).
Required Fire Protection System	Equipped throughout with an automatic sprinkler system or approved automatic smoke or heat detection system.	Equipped throughout with an automatic sprinkler system or approved automatic smoke or heat detection system.	Protected throughout by an automatic fire detection system or an automatic sprinkler system.	Protected throughout with a supervised automatic sprinkler system, AND 1 of the following: a) complete smoke detection system throughout the locked space, OR b) ability to remotely unlock doors from an approved location within the locked space that is constantly attended.
Actuation Time	Up to 3 seconds (was 1 second prior to the 2015 IBC) when force of 15 pounds is applied.	Release is not required to be actuated by an occupant attempting to operate the door.	Up to 3 seconds when a force of 15 pounds is applied.	Release is not required to be actuated by an occupant attempting to operate the door.
Automatic Release Delay	15-second delay before lock releases to allow egress (30 seconds with AHJ approval).	Lock is not required to release automatically after actuating the door hardware.	15-second delay before lock releases to allow egress (30 seconds with AHJ approval).	Lock is not required to release automatically after actuating the door hardware.
Rearming After Actuation	Manual rearm required.	Not addressed in the 2015 IBC.	Manual rearm required.	Not addressed by NFPA 101-2015.
Audible Alarm	Audible alarm required.	No audible alarm required.	Audible alarm required.	No audible alarm required.
Signage	Required Signage: "Push [pull] until alarm sounds. Door can be opened in 15 [30] seconds." Signage must be on the door above and within 12 inches of the door exit hardware. New in 2015: Signage must comply with A117.1 requirements. In Group I occupancies, AHJ may allow signage to be omitted for certain types of treatment areas.	No signage required.	Required Signage: "Push [pull] until alarm sounds. Door can be opened in 15 [30] seconds." Signage must be readily visible, durable, with letters not less than 1-inch high and 1/8-inch stroke with a contrasting background, located on the door adjacent to the release device on the egress side.	No signage required.

	2015 International Building Code		2015 NFPA 101 - The Life Safety Code	
	Delayed Egress	Controlled Egress	Delayed Egress	Controlled Egress
Action on Actuation of Fire Alarm / Sprinkler System	Unlock for immediate egress (no delay).	Unlock for immediate egress (not required for psychiatric treatment areas where restraint or containment is required because of patients' clinical needs, and - new in 2015 - not required when a listed child abduction system is used in an I-2 hospital nursery or obstetric area).	Unlock (no delay) in the direction of egress upon actuation of sprinkler system, or not more than one heat detector, or not more than two smoke detectors.	Unlock for immediate egress upon activation of the smoke detection system, waterflow in the automatic sprinkler system (not required where patients require specialized security measures or where patients pose a security threat).
Action on Power Failure	Unlock for immediate egress (no delay).	Unlock for immediate egress (not required for psychiatric treatment areas where restraint or containment is required because of patients' clinical needs, and - new in 2015 - not required when a listed child abduction system is used in an I-2 hospital nursery or obstetric area).	Unlock for immediate egress (no delay).	Unlock for immediate egress (not required where patients require specialized security measures or where patients pose a security threat).
Remote Release	Capable of being deactivated at the fire command center and other approved locations.	Capable of being unlocked by a switch which directly breaks power to the lock, located at the fire command center, nursing station, or other approved location (not required for psychiatric treatment areas where restraint or containment is required because of patients' clinical needs, and - new in 2015 - not required when a listed child abduction system is used in an I-2 hospital nursery or obstetric area).	Not addressed in NFPA 101-2015.	Remote control of locks is one option for rapid removal of occupants (see below for additional options). For new occupancies, remote control must be from within the locked area.
Staff Release	Not required.	Procedures for unlocking doors must be part of emergency plan. All clinical staff must carry keys, codes, or other credentials to unlock doors.	Not required.	Staff can readily unlock doors at all times. Rapid removal of occupants facilitated by a) remote control of locks (for new occupancies remote control must be from within the locked area), b) keys carried by staff at all times, or c) other reliable means always available to staff.
Emergency Lighting	Required on the egress side of the door.	Must be provided at the door.	Required on the egress side of the door.	No requirement for emergency lighting referenced in this section.
Maximum Quantity of Devices	One delayed egress lock per egress path. New in 2015: I-2 or I-3 occupancies may have 2 doors with delayed egress locks in one egress path, with a maximum combined delay of 30 seconds.	Occupant must not be required to pass through more than one controlled egress lock before entering an exit (not limited for psychiatric treatment areas where restraint or containment is required because of patients' clinical needs, and - new in 2015 - not limited when a listed child abduction system is used in an I-2 hospital nursery or obstetric area).	Refer to occupancy chapter limitations above.	One locking device per door, maximum, for new occupancies. AHJ may approve more than one lock per door for existing occupancies.
Required Listings for Locking System	UL 294 - Standard for Access Control System Units	UL 294 - Standard for Access Control System Units	No specific listing referenced in this section.	No specific listing referenced in this section.
Type of Locking Hardware Typically Used	Approved, listed, delayed egress panic hardware or fire exit hardware, delayed egress mag-lock, or other electrified lock with listed delayed egress controller.	Controlled egress panic hardware or fire exit hardware, electromagnetic lock, or other fail safe electrified lock.	Approved, listed, delayed egress panic hardware or fire exit hardware, delayed egress mag-lock, or other electrified lock with listed delayed egress controller.	Controlled egress panic hardware or fire exit hardware, electromagnetic lock, or other fail safe electrified lock. Note: NFPA 101-2015 allows these doors to be disguised with murals in existing health care occupancies if certain criteria are met. Refer to section 19.2.2.7.

REINVENTING STAIRWAYS

Using Fire-Rated Glass



SAFTIFIRST Photo

The GSA is leading the way in reinventing stairways using fire-rated glass. Designers can make workplaces more productive and healthier by using fire-rated glass to make stairways open and appealing, which encourages building occupants to use them more often.

Just two minutes of stair climbing a day can prevent the pound of weight that the average American adult gains each year. However, simply knowing this or seeing a sign asking occupants to take the stairs is generally not enough to make someone take the stairs—but centrally located, spacious, appealing staircases will encourage use. There's a "movement" underway to transform dark, hidden stairwells into prominent, spacious, inviting staircases filled with natural light. The stairway renaissance not only provides health benefits, but saves energy, provides vertical flexibility and connectivity, and improves workplace efficiency and overall occupant safety.

Active design seeks to convert stairwells "originally conceived as rarely-to-be-used contingencies . . . bare and unappealing, the doorways solid and downplayed" into well-designed stairways with transparent, fire-resistive glass walls that let in daylight, carry corporate branding and provide safe egress for building occupants to use in an emergency. Today's fire-rated glazing and framing products offer building materials that support design efforts to make stairs more visible, appealing and safe.

ACTIVE DESIGN REQUIREMENTS AND BENEFITS

When the active design movement started in 1990s, it was two-fold. First, the Center for Disease Control and the Robert Wood Johnson Foundation sponsored studies linking inactivity to obesity and illness. Second, increased awareness became a trend in the building community in designing buildings that conserve energy and promote collaboration, workplace efficiencies, community and safety. Recent progress in making stairways prominent has been spurred by policies adopted by the U.S. General Services Administration (GSA) and Mayor Bloomberg, as well as publicized active design projects created by leading architects.

ENERGY CONSERVATION

Starting in 2006, the U.S. General Services Administration (GSA) adopted a policy to promote stair use in all 8,600 federal buildings. The GSA's Architectural and Interior Design Standards (2003) require: "The location of stairs within buildings should encourage their use in lieu of elevators to the fullest extent possible. This will reinforce the recognition of sustainable energy conservation."

Commercial buildings account for 35% of total U.S. electricity consumption, and elevators use 10% of a building's energy. Cutting elevator use saves electricity and money. Projects seeking LEED credits can obtain an Innovation in Design credit for promoting routine stair use which promotes indoor physical activity, and other LEED credits for energy savings.



SuperLite II-XL 120 in GPX Framing is used on all 14-floors of the LEED Platinum-certified San Francisco Public Utilities Commission Building. SAFTIFIRST Photo

HEALTH BY DESIGN

In 2013, New York City's Mayor Bloomberg issued an Executive Order to require all city agencies to use active design strategies in all new construction and renovation projects in order to get people moving. The Active Design Guidelines published in 2010 include a requirement to "focus on stairs rather than elevators as the principal means of vertical travel for those who are able to climb the stairs." In high-rise buildings, the Active Design checklist requires an integrated vertical circulation system that incorporates stair use between adjacent floors.

Dr. Karen Lee, a New York City official who helped develop the Active Design Guidelines, cited the rapidly rising rates of obesity and chronic illnesses directly linked to inactivity and poor diet as urgent reasons for rethinking aspects of the built environment. Stair climbing burns more calories than jogging. A study of 10,000 men showed that climbing 20-34 stairs a week (or 3-5 flights a day) reduces



SuperLite II-XL 120 in GPX Framing add daylight and transparency to this 2-hour stairwell. SAFTIFIRST Photo

the risk of stroke by 29%. “When staircases with innovative design features are placed more prominently within a building, stair use goes up 72%,” said Dr. Lee.

David Burney, commissioner of New York City’s Department of Design and Construction, says that for decade’s architects and planners have made it easy for people to be sedentary, and that active design principles ask “design professionals to be part of the solution and find new ways to encourage movement.”

VERTICAL FLEXIBILITY AND CONNECTIVITY

Gensler’s Bob Peck, who also served as the head of GSA’s Public Building Service, sees other benefits of internal stairways. “We workplace strategists and designers have learned how to create office layouts that optimize space utilization, flexibility and efficiency,” wrote Peck. “But, we’re still vertically challenged: we haven’t solved flexibility and connectivity in the critical vertical dimension . . . How can we overcome this vertical challenge? Of course, the answer is ‘stairways.’ But not stairs as we currently design them.”

Peck goes on to discuss how the use of open stairways can increase visibility and transparency between floors in ways elevators cannot. “Chance encounters happen. Communication and ideas flow.” Peck should know. He oversaw the conversion of the GSA’s 1917 headquarters building in Washington D.C., where an internal stairway tied together two floors of top level managers into one.

WORKPLACE EFFICIENCY

Walking up or down stairs is faster than taking the elevator, without even accounting for elevator waits or distance to the elevator or stairway. To ascend one level via

an elevator takes 36 seconds and to ascend one level via the stairs takes almost a third less time, 13 seconds. Studies show that this efficiency is especially vital in hospitals where health care workers, like respiratory therapists and pharmacy techs, can better serve patients using the stairs between physical units lying on top of each other.

OCCUPANT SAFETY

Better designed stairways with wider steps, natural light and openness to building interiors are safer. When the Architectural Team in Boston redeveloped the 1939 Homes at Old Colony, a public housing project, they removed dark isolated stairways and replaced them with stairways filled with natural daylight that opened to lobbies. The result is that residents are safer and more connected to the community. And, by adding additional, spacious, accessible stairways leading to exits and built to code using fire-rated glass and framing, you improve emergency exit safety in the event of a fire.

FIRE-RATED GLASS AND FRAMING HELP MAKE STAIRS MORE PROMINENT

For new construction and major renovation projects, prominent stairways can be integrated seamlessly from the start. But, what about existing buildings? How can stair use be promoted at minimal cost while meeting building and fire safety codes?

New York City’s Active Design Guidelines note: “that most building codes look at stairs as part of an emergency access and exit system.” But they also point out that buildings that better incorporate everyday stair use may actually improve occupant safety in emergencies by making the stairs more accessible, better lit and wider.

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Michael Palmacci
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CHICAGO

Alex Bitzenhofer
ABitzenhofer@generalinsulation.com

FLORIDA

Tyler Babb & Jim Johnson
TBabb@generalinsulation.com
JJohnson@generalinsulation.com

TEXAS

Todd Moore
TMoore@generalinsulation.com

NEW YORK CITY

Brad Hopkins
BHopkins@generalinsulation.com

NEW YORK - UPSTATE

Steve Chamberlain
SCHamberlain@generalinsulation.com

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Furthermore, whereas code mandated fire separations are traditionally met through the use of masonry or gypsum board with solid metal doors, the guidelines note that exit stairs can be made more visible and appealing by using fire-rated glass enclosures.

Bob Peck points out that there is an economical way to transform existing fire stairwells into attractive, inviting stairways favored by active design. He suggests that “fire doors can be appealing, with glass panels, glass sidelites and signage. The stairwells themselves could have fire-rated windows to let in daylight and could carry corporate branding. The doors could even be on ‘hold open’ devices that would automatically close them in the event of a fire.

“The use of glass to pay design attention to fire stairwells and doors will add some cost to construction, but not nearly as much as slab cut internal stairs. Fire stairs are not the only solution. In some older buildings, an existing light well or atrium could accommodate an internal stair without requiring slab cuts.”

The New York City office of Perkins + Will, designer of the recently opened 700,000 sf police academy headquarters in Queens, New York, made a statement. Described as a “skyscraper on its side,” the “building is designed for stairs to be the primary means for people to be moving anywhere,” said project architect Joan Blumenfeld. Blumenfeld also served as president of the New York chapter of AIA and worked with the Bloomberg administration on the Active Design Guidelines. Blumenfeld pointed out that New York City’s new construction codes permit buildings to use fire-rated glass doors and smoke activated automatic closing devices, which allows as many stairwells as possible to be visible and more inviting to building occupants.

CONCLUSION

Active design principles and projects are taking root in federal buildings and some areas of the country, like New York City. This trend is not yet at a scale needed to give everyone access to buildings that promote stair use for energy conservation, health benefits, workplace connectivity, efficiency and improved safety. But, fire-rated glass and framing is available to ease the transition by making stairway open and appealing cost effectively. 🔥

Diana San Diego has over 10 years of experience in the architectural glazing industry and over 13 years of experience in public relations and marketing. As the Vice President of Marketing at SAFTI FIRST, she oversees the advertising, content management, media relations, promotional activities and communication initiatives for the company. You can reach her via email at dianas@safti.com.



For this 2-hour stairwell, SuperLite II-XL 90 is used to exceed 100 sq. in. in the door vision panels while SuperLite II-XL 120 in Stainless Steel GPX Framing is used for the sidelites and transoms. SAFTIFIRST Photo

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2. SEC. 607. The General Services Administration shall conduct a program to promote the use of stairs in all Federal buildings. (Public Law 109-115, GSA Appropriations Act for FY 2006)
3. Lichtman, Flora, “One Step to Combat Obesity: Make Stairs More Attractive,” NPR, August 4, 2014
4. Gutis, Phil, “Building Healthy Places: A Stairway Renaissance,” *UrbanLand, The Magazine of the Urban Land Institute*, October 17, 2013
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COMMUNITY RISK REDUCTION

... It's Not Just Fire Prevention Anymore

Ask anyone in the United States to quote a fire-safety message and you'll likely get one of three responses: "Only you can prevent forest fires," "Stop, Drop and Roll" or "Crawl Low through Smoke."

Thanks to Smokey Bear and longstanding public safety announcements featuring the actor Dick Van Dyke, these phrases have become part of America's lexicon. Children and adults of all ages can recite them with ease. These messages resonate with the public while imparting important information, but they do not capture the entire picture of the American fire services safety efforts in its traditional "Three E's" to solve the fire problem: Education, Engineering and Enforcement.

For more than a century, America's fire departments and other public safety officials have emphasized the importance of fire prevention to minimize fire-related deaths, injuries and property damage. In the most recent generations, the Three E's were a mantra for strategic approaches to solving the fire problem. Public fire-safety Education is intended to teach positive fire prevention and survival skills. Engineering tools such as fire sprinklers, smoke alarms and fire/smoke dampers provide protection should a fire break out. Enforcement is the idea that legally adopted building, mechanical and fire codes are employed to the fullest extent of the law.

But as America's fire environment changes (see Figure 1), the fire service has had to change with it. As the number of fire incidents falls and fire deaths and injuries are at their lowest point ever, fire services are turning their attention to other unsolved problems. No longer are these community representatives focused solely on fire prevention but they are taking a holistic approach called community risk reduction (CRR).

WHAT IS CRR?

Community risk reduction, as described by a leading advocacy effort Vision 20/20¹, is a "process used by fire departments to identify local risks, followed by the coordinated and strategic investment of resources to

reduce their occurrence and impact." A critical element of the program is the collection and analysis of data from a variety of sources to bring safety issues into clarity. Fire incident data, emergency medical services reports, law enforcement data, mortality statistics, hospital trauma admissions and emergency room visit numbers, construction and remodeling permit numbers . . . all these data sources add up to provide a better understanding of community risks. You might imagine the surprise among fire departments when they learned their biggest issues weren't fires, but such day-to-day hazards as slips, trips and falls, bathtub or swimming pool drownings, repeat medical calls to a small core group of ambulance service users, unbuckled children in moving cars, or falls from bicycles, skateboards and, now, those trendy hoverboards. Traditional fire prevention messages and tools had no effect solving these problems.

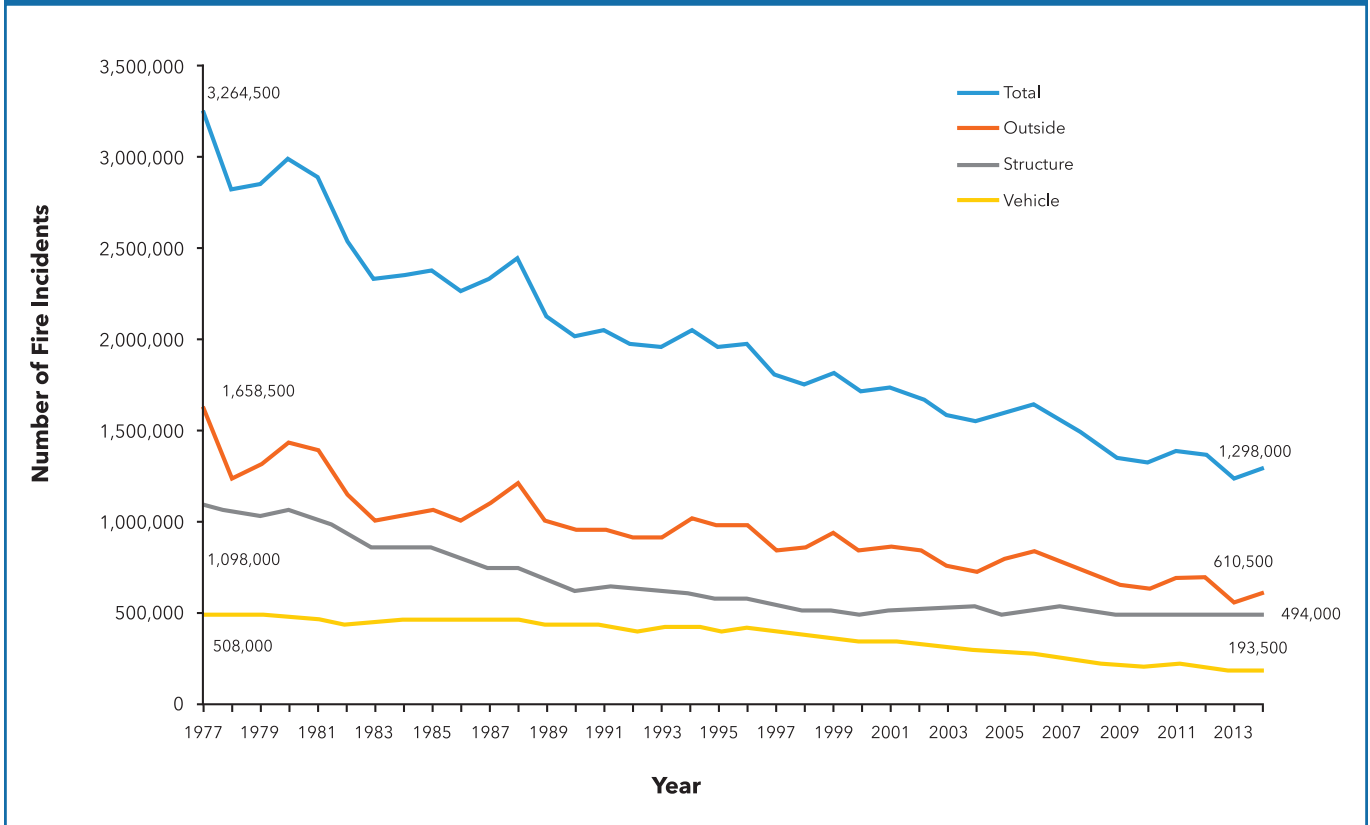
The historic Three E's have now grown into five, adding Economics and Emergency Response, to recognize the essential role of their important contributions to the cause. Even the most innovative life safety and fire protection solutions will not work if they are not Economically viable. Adding Emergency Response includes the recognition that when all the preventive tools fail, Emergency Response services will be there to mitigate the problem. Furthermore, bringing Emergency Response into the fold appeals to fire fighters who may believe their role in public safety is not incident prevention, but only Emergency Response.

WHY IS COMMUNITY RISK REDUCTION IMPORTANT?

From the Vision 20/20 website, we find three key justifications:²

- "Our communities demand an integrated approach that balances emergency response capabilities with proactive measures that work together to reduce risks." It has long been recognized that no community can

Figure 1



afford to provide a fire station in every neighborhood, fully staffed and ready to respond at a moment's notice. However, in many communities, the spending on emergency response may be five to ten times more than is spent on traditional fire prevention or modern community risk reduction efforts. Progressive fire service leaders are recognizing this has to change.

- "CRR empowers station leaders to tailor their proactive strategies to meet local risks and improve efficiency." Individual community risks are just that: based on the individual community. Dr. Denis Onieal, acting deputy administrator of the U.S. Fire Administration, is fond of saying that trying to promote grain silo fire protection in Manhattan, New York, would be as successful as trying to promote underground transit fire protection in Manhattan, Kansas. CRR helps communities identify their particular local hazards so programs can be laser-focused on reducing those risks.
- "Partner with other community organizations to accomplish risk management objectives and to enhance our relationship with the public we serve." There are many organizations and government entities that try to improve public welfare. There are occasions where one group may be more effective than another at accomplishing a specific goal.

For example, the American Red Cross recognized one of its biggest tasks was helping victims displaced by fires. To address that, the Red Cross and its partners have launched an initiative that aims to reduce deaths and injuries caused by home fires by 25% in five years with the Home Fire Campaign. They have partnered with leading battery manufacturers, fire service organizations, retail foundations, government entities and other benevolent organizations who so far have installed several hundred thousand smoke alarms in the US.

WHAT'S NEXT?

Based on this third Vision 20/20 recommendation, perhaps it's time to even out the numbers and add a sixth E: Engagement. None of the individual E's could succeed without the passion and commitment of the men and women who work hard in community risk reduction. They are engaged in the work they do to protect lives and property from a variety of threats. Recognizing and rewarding this Engagement will do nothing less than reinforce the positive behaviors.

The Firestop Contractors International Association (FCIA) is just one of many stakeholder groups engaged in protecting the built environment and those who live, work and play in it. Their members' work and attention to

detail makes a difference in lives saved and property damage mitigated (see Figure 2). In the summer 2015 issue of *Life Safety Digest*, Aideen Doneski reminded readers of the important role firestop contractors play:

... We have the expertise to help our customers find solutions to the extremely complex nature of health care buildings and facilities. We have the knowledge to select the right firestop system for the application, ensure its proper installation and maintain the hourly rating and integrity of any firestop assembly.³

Engagement comes in many forms: participating in the development of the International Code Council family of codes and standards, advocating for community risk reduction in the media and schools, training code officials to better understand the subtleties of F and T ratings, answering media questions before and after fires, participating in the political process and, as Doneski said, just being “at the table” to assure industry interests are fairly and reasonably represented.

SUMMARY

Despite the downward trend in fires, fire services know there are other risks that will keep them busy with children, adolescents, adults and the elderly. Community risk reduction—including the assurance that every last detail, no matter how small, in fire barriers is protected properly—will go a long way to improve everyone’s quality of life. 🔥

Rob currently serves as the International Code Council Vice President for Government Relations: National Fire Service Activities. He is responsible for strategic guidance to help local fire organizations adopt and enforce the most recent version of the model codes based on technical merit and build relationships among code enforcement entities. Rob can be reached at 202.440.3244 and rneale@ICCsafefire.org.

LIST OF ILLUSTRATIONS

Figure 1. Fire incidents by type in the United States from 1977 through 2014. Reprinted with permission from NFPA’s report, “Fire Loss in the United States During 2014” by Hylton J. G. Haynes © 2015, National Fire Protection Association.

Figure 2. Attention to detail in fire barrier management can mean the difference between failure and a successful incident outcome. Professionals must be fully engaged to understand that importance in community risk reduction. (Photo courtesy of Apex Firestopping).



Figure 2: FCIA Photo, Apex Firestopping

END NOTES

1. Vision 20/20 is a nationwide grassroots group of volunteers from a variety of disciplines who have developed long-term strategies to reduce community risk. More information can be obtained at www.strategicfire.org
2. Vision 20/20 (2016). “Why is Community Risk Reduction Important?” retrieved from <http://strategicfire.org/wp-content/uploads/2015/04/CRR-One-Sheet-V9.pdf>
3. Doneski, A. (2015). “Fire Barrier Management & “A Call to Action”: Why Firestop Contractors Should Be at the Table,” pp 6-8. *Life Safety Digest*, Summer 2015.

FM 4991 APPROVED AND UL-ULC QUALIFIED CONTRACTORS LEAD THE WAY

When the Firestop Contractors International Association (FCIA) was founded in 1999, one of its main goals was to improve the installed quality of life-safety firestop systems. That's what spawned FCIA's 'DIIM'—proper Design—Installation—Inspection—Maintenance/Management—philosophy.

D-DESIGN

Firestopping is specified by professional CSI Certified Construction Specifiers (CSC) and Registered Specification Writers (RSW) where tested and listed systems are then directed to be selected by the firestop contractor.

I-INSTALLATION

In 1999, specifiers asked us for a standard that would quantifiably qualify a contractor's qualifications. The result was the FM 4991, Standard for the Approval of Firestop Contractors and UL/ULC Qualified Firestop Contractor Programs.

I-INSPECTION

FCIA's Standards Committee worked with the industry to develop and maintain the ASTM Inspection Standards ASTM E 2174 and ASTM E 2393, which are required by the 2012 and later International Building Code. FCIA was the code proponent adding the requirement to the code.

M-MAINTENANCE

Maintenance is critical to performance of all fire-resistance-rated and smoke-resistant systems in buildings. FCIA's Barrier Management Symposium, delivered to healthcare professionals in partnership with ASHE, UL and The Joint Commission, has helped increase the reliability of installed systems through regular Maintenance of these systems.

Before **M-Maintenance** can begin, the building owner and manager must have a finished building that complies with specification and code requirements. That's why the Design, Installation and Inspection are so important.

How do FM 4991 Approved and UL-ULC Qualified Firestop Contractors Lead the way? There are many reasons. . . .

The 3rd party verified management system provides an insight into what produces a quality installation process. First, FM Approvals or UL Auditors ask questions about the management system manual used to operate firestop operations. The manual is the key document that drives consistency and quality at the firestop contractor company. Key components include:

- **Employee Training**—What levels of education are needed for each role? FCIA's Firestop Containment Worker Education Program can be used for both the workforce and new employees. It includes 22 PowerPoint presentations, quizzes, instruction guides and 2.5 hours of video of actual live installations on construction projects. Manufacturer education is also imperative for a trained staff.
- **Documentation & Recordkeeping**—Submittals, life safety drawings, firestop systems and manufacturers installation instructions need to be kept for 7 years as required by both FM and UL. The 'As Built' systems are critical to ongoing maintenance.
- **Systems Selection**—Understanding how the firestop systems are selected and then analyzed means the contractor is on their way to providing a successful installation, raising life-safety in the building through protection of barriers—fire separations. The management system manual also provides direction to the company about how to communicate the systems to the jobsite.
- **Material Controls**—Materials travel from near and far to jobsites and need to be received in good condition, original containers and not damaged. Procedures document receipt, and non-conforming products are isolated from acceptable products. Out of shelf life materials, defective and broken containers are all examples of where material control is needed.

- **Non-Conformances**—When companies have issues, they document the non-conforming situation and also the corrective action taken to prevent future occurrences.
- **Labeling**—The FM 4991 Approved Contractor Program requires special labels, numbered and documented, if labels are required by specification. An FM logo can be on the label as well.
- **Demonstrated Knowledge**—DRI's—Both the FM 4991 and UL-ULC Qualified Firestop Contractor Programs require that a person take and pass at 80% or better, a Firestop exam associated with each program. After passing the exam and the company becoming FM 4991 Approved or UL-ULC Qualified, the company can appoint that person as a Designated Responsible Individual (DRI).

The DRI directs the company's firestop operations. Each company that is FM 4991 Approved or UL/ULC Qualified must have its own DRI on staff. Should a DRI no longer be at a company, there is a grace period given so the company can select another DRI. DRI status is only provided to the individual at the company that has passed the FM or UL/ULC Firestop Exam. DRI's must be employed by the company that is FM 4991 Approved or UL/ULC Qualified.

Fire-Resistance only works when the assembly and its features of protection—including Firestopping—are installed to the tested and listed firestop system and manufacturers installation instructions.

The key categories of a firestop contractor's management system listed above are part of every FM 4991 Approved or UL/ULC Qualified Firestop Contractor's company culture. These management system processes result in a high-quality installation providing property protection to the building and life-safety to its occupants.

In new construction and existing buildings, firestopping operations need to result in the right material installed in the right tested and listed system configuration. Firestopping needs to be installed by a workforce that is trained to understand the sensitivities of each occupancy—with extra attention paid in healthcare occupancies. (See article, Hospital Work and Infection Control—this issue)

In Firestop Specifications at 07-84-00, specify FCIA Member, FM 4991 Approved and or UL/ULC Qualified Firestop Contractors. These firms have gone the extra mile to build a standard for their operations resulting in a quality installation—with the attention to detail needed to work in healthcare facilities. 🔥

Aedan Gleeson is Chair and Don Murphy Vice-Chair of the FCIA Accreditation Committee. Both Aedan and Don are FCIA Past Presidents and part of the original steering committee that put FCIA in motion in 1998. Aedan can be reached at aedan@gleesonpowers.com and Don at don@ppmfirestop.com.



Sound Fire & Life Safety Inspection Service, LLC Specializes in Forensic Inspections of Occupied Facilities

Sound is the only AC291 Special Inspection firm that has an accredited inspection process for firestop assemblies that do not have submitted listing support compliant with ASTM E 2174 and ASTM E 2393— **If your facility has fire and smoke walls with unlabeled firestops in them then this is the inspection process you may want to consider.**

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#GREATMINDSTHINKPINK

FIRE-RESISTANCE IS A TECHNICAL SPORT

Fire-resistance, Fire-resistance-rated and Smoke-resistant construction, using products from tested and listed systems, is a very technical installation. It takes an understanding of the manufacturers installation instructions and, most important, the ability to read and install products into assemblies as shown in the UL, FM Approvals or Intertek Directory Listings.

Walls made from gypsum panels are installed to the tested and listed systems and manufacturers installation instructions from the U400 series systems. After installation to the system, they become fire-resistance-rated assemblies.

Gypsum boards need to be installed to the tested assembly specifications exactly. Fastener spacing, offset joints from one side to the other side of the wall, insulation or not included in the assembly, all are stated in the UL U400 series System. A sample system, U419, can be viewed for free online at UL's Fire-resistance Directory.

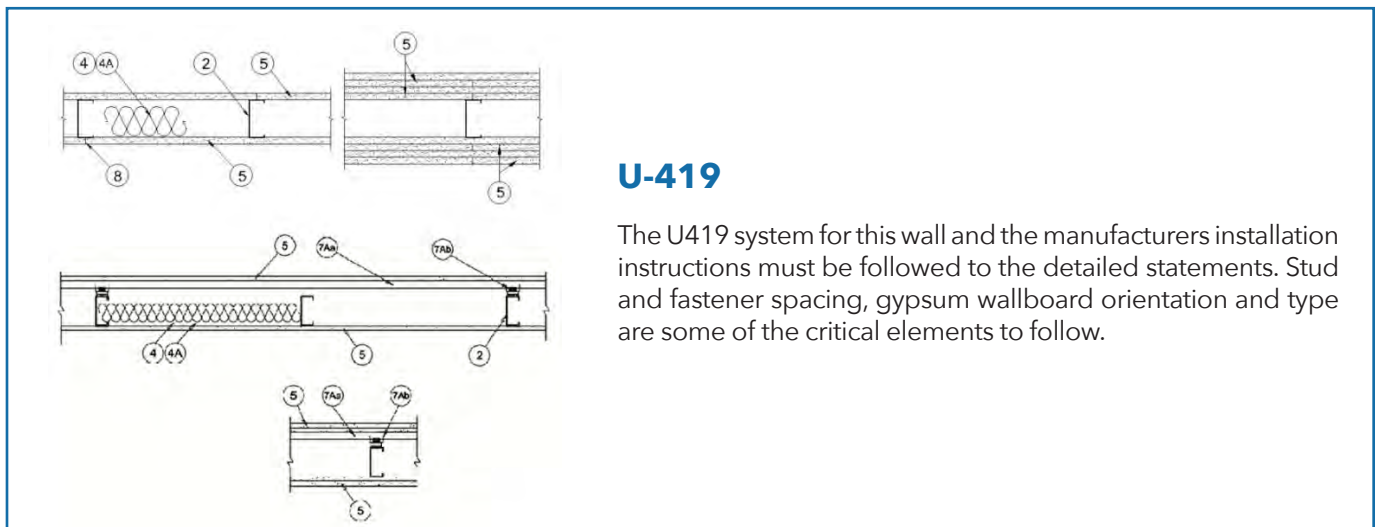
Concrete Block walls are also in the directory. Concrete, composite wood and gypsum floor ceiling assemblies are also listed at UL's Fire-resistance Directory, at UL.com. Scroll down on UL.com for the "Online Certifications Directory".

Firestop Systems are installed in breaches made in fire-resistance-rated and smoke-resistant walls and floors to keep the rating of the wall or floor continuous. Breaches in

assemblies allow pipes, cables and other service items to pass through or into the fire-resistance-rated assembly. These breaches need to be treated to keep the continuity of the fire-resistance-rating continuous through the breach.

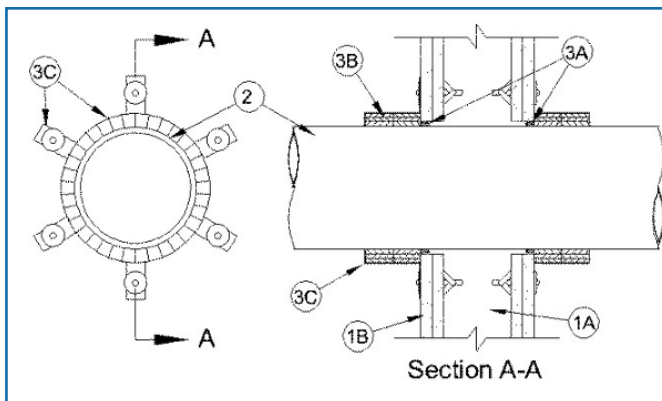
Firestop products, *installed to the tested and listed system from UL, FM Approvals or Intertek / other directory*, bring continuous fire-resistance to the breach in the assembly as a **Firestop System**. Test standards ASTM E 814, UL 1479 and ULC S-115 are used to evaluate products installed as complete systems for fire-resistance. Systems have very specific installation requirements in addition to manufacturer's instructions. Annular space size limitations must be followed or the system may not work. Minimum thicknesses of firestop sealants need to be adhered to in order to maintain fire-resistance.

Breaches are made for separation of adjacent assemblies or isolation of dissimilar materials. When the breaches are treated with a **fire-resistance-rated expansion joint system**, the fire-resistance-rating of the assembly is continuous. Again, fire-resistance continuity is maintained through tested and listed firestop systems. ASTM E 1966 and UL 2079, ASTM E 2307, ASTM E 2837 and ULC S-115 provide a standard for evaluating these products once installed assemblies as systems.



U-419

The U419 system for this wall and the manufacturers installation instructions must be followed to the detailed statements. Stud and fastener spacing, gypsum wallboard orientation and type are some of the critical elements to follow.



W-L-2174

System W-L-2174 has lots of detail to follow even though it looks simple in the picture. The annular space size and orientation of the penetrating item through the breach, type of plastic pipe, and firestop materials, anchors and other elements need to be followed. There are no "generic designs" in firestopping.

Openings with **Fire Doors, Fire Dampers, Fire-Rated Glazing**, also need to have tested and listed systems installed exactly to the tested and listed system.

Fire-resistance-rated and smoke-resistant systems are complex systems. Some are easier to install to the tested and listed system than others. **What all have in common is that the product does not get a rating. It's the System that gets the rating.**

Specifiers communicate tested and listed systems with product physical properties that meet field conditions through clear, concise specification section 07-84-00 Firestopping.

Building Owners and managers, and general contractors, buy fire-resistance-rated and smoke-resistant systems AND products that are listed in the systems.

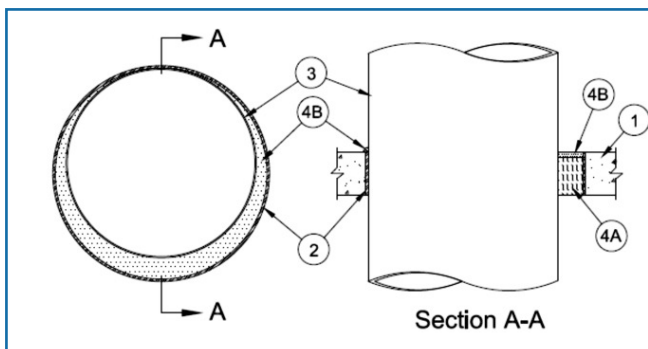
Tested and Listed Systems for firestopping are critical to the fire-resistance continuity of the wall or floor. Firestop Contractors understand this and select and install systems that meet the fire, smoke, water, germ and other resistance required by the special conditions expected to occur in the structure. Systems selection is complex and occurs after the penetrating items are known. That's why we recommend specifiers not put systems designs on

the plans as the type, size and configuration of penetrating items are not known until after the structure is well under construction.

Technical, life safety fire-resistance-rated and smoke-resistant assemblies work together as a system. Insist on FCIA Member, FM 4991 Approved and or UL/ULC Qualified Firestop Contractors for installation of firestop products to these systems.

All fire-resistance-rated and smoke-resistant systems have very strict installation requirements to the limitations of the system. Sleeves too high extending past the floor? A firestop system that shows the sleeve extending the same length as in the system description is needed. Plastic or metal sleeve? Sleeve type must match the system exactly and be cast in place if called for in the system. Expansion joint sizing must also match the system description regardless of the product used to protect the breach in a fire-resistance-rated wall or floor. And, there are no 'construction tolerances' allowed in systems installation.

Construction is not as easy as it looks. Firestopping isn't either. Firestopping is not as easy as carrying around a caulk tube and squirting material around. It's a very technical part of Fire-resistance-rated Construction, and it should be left to professional, trained Specialty Firestop Contractors to install. 🔥



C-AJ-1155

C-AJ-1155 looks real simple. Sleeve type and attachment is specified in the system. Where the Firestop system is installed—at the tip of the sleeve or at the floor or wall level is also specified. Annular space sizes, and more are found in the system.

All firestop systems - penetrations or joints - follow the same process. Match the system parameters to what exists in the field. Refer to complete system design at UL.com and manufacturer's installation instructions to understand how these systems are to be specified, installed, inspected and maintained. There are a lot more details to follow exactly to get the firestop system installed to the tested and listed system. Any deviations violate the system and may cause failure of the assembly during a fire. Firestopping is not an easy sport. It is highly technical and requires expertise to get life-safety systems installed correctly.

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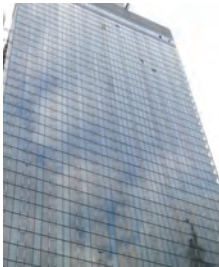
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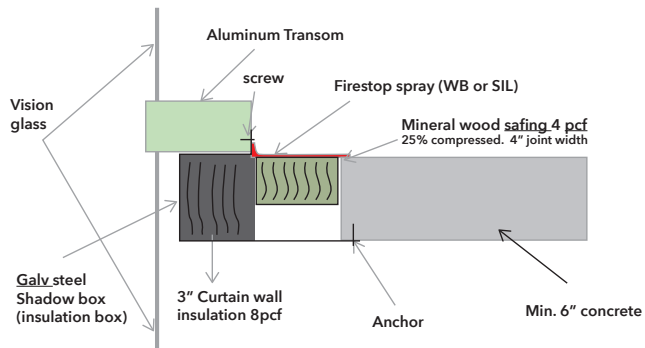
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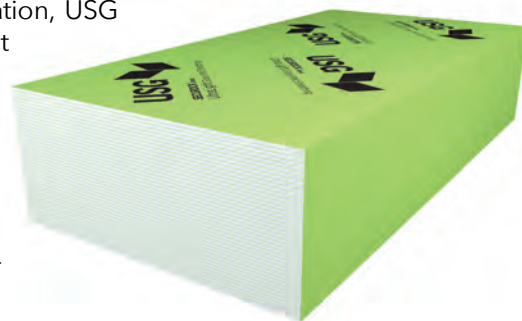
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CODES AND STANDARDS NEWS



The 2018 International Code Council (ICC) Code Development Process is still underway. The Committee Action Hearings (CAH) were held in Louisville, KY the week of April 17-27, with hearings taking place from 8am to 10pm most days.

Committees consisting of volunteers selected by ICC's Board of Directors worked diligently listening to testimony, making helpful suggestions to both proponents and opponents of proposals alike. Fire, Energy, Building Code Administrative and Structural sections, plus Residential Building issues were among the items debated throughout the Committee Action Hearings.

The code development cycle actually started in January with proposals due for submission using ICC's cdpACCESS tool. The proposals were then put into a monograph and

published around March 8 for review by the public. The monograph is about 2,000 pages long and is used as the basis for debate at the hearings.

During the CAH, the Code Committees are seated at large tables positioned onstage front and center, where they hear the proposals before them. The moderator calls proposals by number, and the debate starts. Two minutes each are given to the proponent and anyone who agrees with and supports the proposal. Two minutes are then given for rebuttal. One minute is given to the supporters who rebut the information from opponents. One minute is also given for re-rebuttal by the opponents. The moderator then, seeing no more opposition to the proposal, passes the microphone to the chair of the committee who calls for a motion and a 2nd. Open discussion takes place amongst the committee and the

question is called for voting. After either approval or disapproval, the moderator then announces the result and calls the next proposal to the assembly.

The Code Committees at ICC that hear these proposals are comprised of a balanced group of half building code officials and half industry representatives.

FCIA's Executive Director Bill McHugh spent time at the hearings working with many others there, including FCIA's Code Consultant Bill Koffel. We listened and testified on the FCIA proposal during the Fire Code debates.

Below are code proposals that may be of interest to those who watch fire-resistance-rated and smoke-resistant construction issues closely. New text is always marked through with underlines and strikethrough is text that is to be deleted.

In the Administrative section, Tom Zaremba, of Roetzel and Andress, representing himself, attempted IN ADM 44 to add a very important statement to the Building Code about total fire protection in buildings. Although disapproved, the proposal brought attention to the importance of fire-resistance-rated systems to the code bodies:

ADM44 IBC: 101.3.1 (New) DISAPPROVED 13-0.

Proponent: Tom Zaremba, Roetzel & Andress, representing self (tzaremba@ralaw.com)

2015 INTERNATIONAL BUILDING CODE

[A] 101.3 Intent. The purpose of this code is to establish the minimum requirements to provide a reasonable level of safety, public health and general welfare through structural strength, *means of egress* facilities, stability, sanitation, adequate light and ventilation, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

Add new text as follows:

[A] 101.3.1 Life-safety When considered as a whole, built environments shall be such that the life-safety of building occupants, whether the public, fire fighters or emergency responders, does not depend on a single fire protection system, or fire-resistance-rated material, system or assembly. Life-safety features shall be diverse and, to the extent practicable, redundant in case any single life-safety feature is ineffective, whether due to human action, inaction or system failure.

Reason: This proposed addition to Chapter 1, merely states what is already being done in the International Building Code. Since it is already being done, no additional changes to this precept need to be made to the code. Since this is already a guiding precept of the code, it should be articulate amongst the purposes of the code. (Section 4.5.1 of NFPA 101, Life Safety Code, is a similar statement of precept).

Cost Impact: Will not increase the cost of construction. Since the International Building Code already follows this precept, no other changes to the IBC are necessary and articulating this precept amongst the purposes of the IBC will not increase the cost of construction.

The Committee reason for the disapproval was that it added too much redundancy to the code. Note that the committee did not disagree with the statement that all types of fire protection are needed to protect people in buildings.

In ADM 75 and 76, the International Firestop Council attempted to deal with the submittals of firestop systems designs. This proposal was for the IBC, IEBC and IFC Codes. The intent of the way the proposal is written is to have systems submitted at the time of the permit application.

IBC: [A] 107.2.2; IEBC: [A] 106.2.2; IFC: [A] 105.4.2.1

Proponent: Tony Crimi, representing International Firestop Council (tcrimi@sympatico.ca)

2015 INTERNATIONAL BUILDING CODE

Revise as follows:

[A] 107.2.2 Fire protection system shop drawings. Shop drawings for the ~~fire protection system(s)~~ fire protection systems shall be submitted to indicate conformance to this code and the ~~construction documents~~ construction documents and shall be ~~approved~~ approved prior to the start of system installation. Plans for buildings more than two stories in height of other than Group R-3 and Group U Occupancies shall indicate how required structural and fire-resistive integrity will be maintained where a penetration will be made for electrical, mechanical, plumbing and communication conduits, pipes and similar systems. Shop drawings shall contain all information as required by the referenced installation standards in Chapter 9.

2015 INTERNATIONAL EXISTING BUILDING CODE

Revise as follows:

[A] 106.2.2 Fire protection system(s) system shop drawings. Shop drawings for the fire protection system(s) ~~systems~~ shall be submitted to indicate

conformance with to this code and the construction documents and shall be approved prior to the start of system installation. Plans for buildings more than two stories in height of other than Group R-3 and Group U Occupancies shall indicate how required structural and fire-resistive integrity will be maintained where a penetration will be made for electrical, mechanical, plumbing and communication conduits, pipes and similar systems. Shop drawings shall contain all information as required by the referenced installation standards in Chapter 9 of the *International Building Code* International Fire Code.

2015 INTERNATIONAL FIRE CODE

Revise as follows:

[A] 105.4.2.1 Fire protection system shop drawings.

Shop drawings for the fire protection system(s) systems shall be submitted to indicate compliance with conformance to this code and the *construction documents*, construction documents and shall be *approved* approved prior to the start of system installation. ~~Plans for buildings more than two stories in height of other than Group R-3 and Group U Occupancies shall indicate how required structural and fire-resistive integrity will be maintained where a penetration will be made for electrical, mechanical, plumbing and communication conduits, pipes and similar systems.~~ Shop drawings shall contain all information as required by the referenced installation standards in Chapter 9.

Reason: Fire-resistance-rated systems and their features that effect structural design are critical components to a building, and as such, they should be given at least the same level of attention in the code as already exists for fire sprinklers and detection and alarm systems. This code change addresses the need to identify how penetrations in fire-resistance-rated building elements or assemblies are required to be protected. The inclusion of these particular elements on shop drawings is critically important to building fire-safety. When firestopping details conforming to the code (i.e. tested systems) are not required on shop drawings, it is common for inexperienced installers to simply make a "best-effort," without referencing or conforming to a tested and listed design. This would lead to penetration seals that would likely allow premature fire and smoke passage through a rated assembly, thus negating the life-safety value of those assemblies. The language above is identical to that contained in Section 91.106.3.3.1 of the 2014 Los Angeles City Building Code. Similar language was also contained in Section [A] 107.2.2 of the 2008 Los Angeles County Building Code.

Supporting testimony from the International Firestop Council included Tony Crimi, IFC Code Consultant, "This is very doable to get penetrations and joints on drawings and locations on the plans. There are two inspection standards for firestop, and this helps it get the inspector the documentation he needs."

Ed Goldhammer, HILTI, stated, "We get many last minute issues. This prevents it." Finally, Vickie Lovell, representing 3M and Fire Safe North America (FSNA) stated, "This is easy for designers. Put drawings where the penetrations are on the plans."

Opponents to the proposal were vocal. Said Chris Bridges, ICC Region 7, "We don't know what the penetrating items are, how can we do this? Too many unknowns. This hamstring us from the start." And Steve Winkle, AIA, said, "Detail a specific assembly? These are specific, not generic. Layer on top? Details will no longer be valid after construction starts due to changes."

Carol Pruitt, AIA, Consultant, chimed in with, "There is no 'Easy' in this."

The issue brought up by the Fire Code Committee that heard the proposal was that this was problematic. Since construction documents are used for permit application by definition in the code, the result is that firestop systems designs would have to be submitted long before Mechanical, Electrical and Plumbing Systems are designed. Firestop Systems would not be able to be selected and submitted due to the penetrating items not being identified nor located.

FCIA offered to work with IFC's Code Committee Chair Ed Goldhammer to review past FCIA Proposals that dealt with this issue and maybe address the code committee and opponent's concerns.

Another proposal, **F6, that was Approved as Submitted**, had the addition that Fire Sprinklers be located at the exterior of a building where there are dumpsters located. The 2012 Tamweel High Rise Apartment building fire in the United Arab Emirates was reportedly caused by a cigarette being tossed into a dumpster located adjacent to the building. The cigarette caused ignition of the material in the dumpster which spread to insulation behind metal panels. The insulation then burned upwards leaving the top stories engulfed in flames with much damage to apartments. This proposal may have been intended to help alleviate this problem and prevent others like it from happening.

The Committee APPROVED this proposal AS SUBMITTED. 9-6. The committee stated, that "Dumpsters on the sides of buildings are a nuisance."

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The ICC Board decided in 2007 to create Committees to deal with code sections where there seems to be a lot of proposals submitted in an environment that allows for in depth discussion. The Code Technology Committee spent time reviewing common issues that came up at code hearings that could not be resolved in two- and one-minute sound bytes. The Code Technology Committee was then split a few years ago into two groups—The Building Code Action Committee and Fire Code Action Committee. There

are also committees that review energy codes as well.

The Fire Code Action Committee (FCAC) formed a task group last fall to revise and clarify the International Fire Code Section 703.1, Maintenance. This is for the maintenance of Fire-resistance-rated and Smoke-resistant Construction. The Task Group consisted of firestop manufacturers, UL and fire code officials. FCIA was not aware of the task group until the proposal came up for review by the FCAC.

For reference, the current 2015 version of the International Fire Code Section 703.1 is below:

SECTION 703: FIRE-RESISTANCE-RATED CONSTRUCTION

703.1 Maintenance. The required *fire-resistance rating* of fire-resistance-rated construction, including, but not limited to, walls, firestops, shaft enclosures, partitions, *smoke barriers*, floors, fire-resistive coatings and sprayed fire-resistant materials applied to structural members and fire-resistant joint systems, shall be maintained. Such elements shall be visually inspected by the *owner* annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated. Records of inspections and repairs shall be maintained. 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 movable entry to 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- or automatic-closing doors of *approved* construction meeting the fire protection requirements for the assembly.

703.1.1 Fireblocking and draftstopping. Required *fireblocking* and draftstopping in combustibile concealed spaces shall be maintained to provide continuity and integrity of the construction.

703.1.2 Smoke barriers and smoke partitions. Required *smoke barriers* and smoke partitions shall be maintained to prevent the passage of smoke. Openings protected with *approved* smoke barrier doors or smoke dampers shall be maintained in accordance with NFPA 105.

703.1.3 Fire walls, fire barriers and fire partitions. Required *fire walls*, *fire barriers* and *fire partitions* shall be maintained to prevent the passage of fire. Openings protected with *approved* doors or fire dampers shall be maintained in accordance with NFPA 80. **[IFC 703.1, 2015]**

In this IFC 703.1 section, there is very clear communication to the building owner and manager that fire-resistance-rated construction and smoke-resistant assemblies need to be maintained.

Visual inspections are to be performed annually to find deficiencies. Wherever there is a breach in the fire-resistance-rated or smoke-resistant assembly, the breaches need to be “repaired, replaced or restored where damaged, altered, breached or penetrated.”

Records of inspections and repairs need to be made as well. Plus, the code goes on to state that *approved* methods need to be used when repairing. The word *approved* is a defined term, meaning approved by the code official.

In the ICC Fire Code Action Committee Proposal, F116-16, covering the current 2015 IFC 703.1, the Task Group proposed to rewrite Chapter 7’s section on Maintenance. The proposal took the current 703.1 Maintenance, and expanded it to have individual sections for each fire-resistance discipline. Each section covered what is required, a statement about maintaining protection, inspection of existing buildings and how to handle unprotected situations.

FCIA saw issues with the proposal and got involved last December to attempt a resolution. See below for the firestop section of the FCAC proposal for 703.1:

SECTION 703 FIRE-RESISTANCE-RATED- CONSTRUCTION PENETRATIONS

Add new text as follows:

703.1 Maintaining protection. Materials and firestop systems used to protect membrane- and through-penetrations in fire-resistance-rated construction and smoke-resistant construction shall be maintained. The

materials and firestop systems shall be securely attached to or bonded to the construction being penetrated with no openings visible through or into the cavity of the construction. [bold emphasis added by Life Safety Digest]

703.2 Unprotected penetrations. All unprotected penetrations in fire-resistance-rated construction and smoke-resistant construction shall be protected as required in the *International Building Code*.

The issue that FCIA had with this section is that the firestop systems are not being described properly. These are systems and not materials.

Secondly, FCIA actually removed similar language from the International Building Code for the 2018 version of the code. The words removed by FCIA are in the proposal, bolded: 'The materials and firestop systems shall be securely attached to or bonded to the construction being penetrated with no openings visible through or into the cavity.'

Below is what was approved during the ICC Building Code Development Process that correctly states the intent of the code and sets up the needed requirement for the very important inspection or survey. This concept brings both the system and material together by referring to the manufacturer's installation instructions and the listing. FCIA's Code Committee may public comment to include this type of language in the FCAC Proposal so it is not misunderstood in the marketplace, through the new code language.

714.2 Installation

A listed through-penetration firestop system shall be securely installed in accordance with the manufacturer's installation instructions and the listing criteria.

It seemed that objections also came from the code committee and others that the unprotected penetrations section requires the building owner to now retrofit buildings to current code without a trigger for the upgrade of some kind.

Likely, the FCAC task group will remove the protection sections for each fire-resistance discipline.

This proposal generated a lot of discussion at the code development hearings. During the FCAC teleconferences last fall, FCAC Task Group Chair Howard Hopper from UL mentioned that FCIA was unintentionally left out of the discussions and therefore should make its own submission for the 703.1 section of the Fire Code. Read on to see our proposal.

FCIA's proposal to modify the FCAC's F113 was allowed by the International Fire Code Chair, Sean DeCrane, to be heard by the Code Action Committee at the hearings. FCIA's modification was to add that drawings need to be available for the building owner to conduct the annual inspection. Without drawings showing where the fire-resistance-rated or smoke-resistant assemblies are located, how can a building owner perform the annual inspection required by the Fire Code?

Opposing testimony stated that this would cause an architect to have to be hired to produce drawings where they do not currently exist. A solution may be to state, 'use drawings, where available.' Records would still be required and the building owner and manager may use many methods to keep those records from paper to spreadsheets to sophisticated Barrier Management System Software.

In the meantime, other opposing comments to the FCAC proposal included: "The definitions are not correct"; "There is no definition for 'smoke-resistant construction'; "This really needs to be cleaned up." "Recordkeeping is already required." "The scope needs better definition."

Further, on FCIA's F-115 Proposal, we requested that records be kept for the life of the installation and drawings are required to be onsite.

Opposition comments included, "Smoke-resistant Construction is not defined." That's a good point and the subject of a future code proposal.

" . . . in 703.1.2, records are needed for the life of the installation. Fire alarms are for 10 years." FCIA noted that Fire alarms are replaced every 10 years.

Others added, "And, the 703.1.5 Fire Blocking is an overreach," and, "This (section) only needs a band aid and not open heart surgery." Another opponent said, "The scope is too far, life of the installation is too long, and there are really no cited problems."

The Fire Code Development Committee DISAPPROVED the FCAC's F113-16 proposal.

Their reasons were that: "Building owners won't do this." "Who enforces this?" "Recordkeeping?" "703.1.4 is problematic." "The first line is awkward."

Want to check out all the proposals? Visit www.FCIA.org for the complete proposals.

After the hearing took place, supporters approached FCIA's Bill McHugh and Bill Koffel that there may be state laws that require records for the life of the building. Watch for a public comment of some kind on this proposal by the July 22 deadline.

The fireproofing industry had a proposal for marking which manufacturers fire-resistive materials were used on a structure. This was disapproved as well. The Fire Code Development Committee stated, "This needs more specificity, and needs to note where the sign is to be located." Others said, "In 703.1.4, fix the 'where required by the fire code official.'" A code official from the committee stated that "this is a good thing and a true issue in jurisdictions like mine."

Check out the results of the hearings at www.ICCSafe.org. There is also a process to challenge a decision of the code development committees. The public can submit changes to the proposals through 'Public Comments.' Public Comments are due July 22, 2016. Forms are available for public comments at ICC's Code Development Tab at the website.

Code Adoptions—Ever wonder about what code is used where? Both the NFPA and International Code Council have pages at their websites dedicated to where their codes are

used. Visit www.ICCSafe.org and www.NFPA.org and put in 'code adoptions.' That's one way to understand what code is used in various jurisdictions.

NFPA Fire Protection Features Committee Meets—NFPA's Code Development Process is a bit different than ICC's. It is an open process that has participation from interested parties. In this process, proposals are submitted through public input and reviewed by committees.

Committees meet to discuss proposals and public comments during a three year revision cycle. With about a year to go, one more meeting and two ballot circulations likely will take place.

The face-to-face Fire Protection Features Committee meeting takes place June 21 in Ft. Lauderdale, FL, USA. FCIA has participated on this committee for about 12 years and FCIA Executive Director Bill McHugh will attend. Watch for a full report on the actions from this meeting in the next issue of Life Safety Digest. 🔥

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INDUSTRY NEWS

FCIA AT IAS BoD MEETINGS

The **International Accreditation Services (IAS)** is a nonprofit corporation that provides “objective evidence that an organization operates at the highest level of ethical, legal and technical standards” for all concerned with public safety and sustainability worldwide. IAS Accreditation Criteria have been used worldwide to accredit special inspection agencies, curriculum developers and deliverers and many other organizations to improve quality through management systems processes.

Members of the **IAS Board of Directors** work together to ensure that the mission and vision of the organization remains the foremost focus of the groups’ efforts.

FCIA’s Executive Director, Bill McHugh, was in Washington, DC and participated in the IAS Board of Directors Meeting.

While in DC, a reception was held for construction association leaders at ICC’s Headquarters to celebrate Building Safety Month. FCIA appreciated the opportunity to meet with other association leaders to build relationships and expose them to the importance of firestopping in buildings.

FCIA MEETS WITH BOMA

Founded in 1907, the **Building Owners and Managers Association (BOMA)** represents the owners and managers of all commercial property types around the globe. FCIA’s Bill McHugh met with BOMA International in Washington, DC to learn how we can work together on the International Fire Code proposal for Maintenance of fire-resistance-rated and smoke-resistant barriers through Chapter 7, Fire and Smoke Protection Features. We discussed key issues from the FCIA Proposal, F115.

This is not the first time FCIA has partnered with BOMA. In the past, *Life Safety Digest* Magazine has been displayed at BOMA Annual Conferences. The publication will be featured there again this year. Thanks to efforts from FCIA, the word about fire-resistance-rated and smoke-resistant construction is getting to the right place—the building owner and manager—who has to live with the building for life.

FCIA MEETS WITH FM & UL

FCIA’s Accreditation Committee Chairs, Aedan Gleeson and Don Murphy, continue meetings and teleconferences with UL & FM personnel to discuss the program and its acceptance by the marketplace.

Both the FM 4991, Standard for the Approval of Firestop Contractors and UL/ULC’s Qualified Firestop Contractor Program are specified widely through MasterSpec and SpecLink references in Specification Section 07-84-00—Firestopping. FCIA worked with both organizations starting in 2002 on the Firestopping Specs.

FCIA has asked both FM and UL to expose the FM 4991 and UL/ULC Contractor Programs to those in the insurance industry. The group believes that by creating heightened awareness of the importance of correctly installed firestopping in buildings—along with the need for the FCIA Member, FM 4991 or UL/ULC Qualified Firestop Contractor—that safer buildings with less losses will result.

ASTM BRINGS TOGETHER INDUSTRY PROFESSIONALS

FCIA's Standards Committee Chair, Eric Keeton, and Committee Member, Jay McGuire, plus Bill McHugh met with other Firestop Industry Technical Personnel at ASTM to discuss changes to ASTM E 2174. The task group at ASTM agreed to new language that describes the accreditation programs available to both contracting companies (FM 4991 and UL/ULC Qualified Firestop Contractor Programs) and special inspection agencies (IAS AC 291). ASTM E 699 Practice for Evaluation of Agencies Involved in

Testing, Quality Assurance, and Evaluating of Building Components, was also successfully removed from the standard as it was irrelevant.

The firestop manufacturers, inspection agencies and contractors spent a full day at ASTM discussing the ASTM Standards for Inspection of Firestop Systems, Qualifications of Inspectors, Movement, Exposure and more. FCIA is pleased to participate in discussions and chair a task group at ASTM's E06.21 Committee.

ICC COMPLETES BUILDING SAFETY MONTH

The International Code Council (ICC) just completed its Building Safety Month. With a focus on building safety, resilience and the importance of building, fire and other codes, the ICC's successes are in the many code adoptions worldwide.

At the ICC's Building Safety Month reception overlooking the US Capital, President Barack Obama read a Presidential Proclamation, applauding codes and those who "... ensure

the safety and resilience of our Nation's buildings, and we reaffirm our commitment to upholding and abiding by strong and effective building safety standards." Congrats, ICC.

FCIA was proud to be a sponsor of Building Safety Month, and looks forward to continuing the partnership to draw attention to the importance of safe building practices globally.

NASFM'S ANNUAL CONFERENCE

The National Association of State Fire Marshals holds its Annual Conference this year in Albuquerque, NM, USA

July 19-21. Learn more at www.firemarshals.org.

NIBS PRESIDENT SPEAKS



NIBS President, Henry Green, is active throughout the construction industry for the National Institute of Building Sciences. Henry frequently moderates at the ICC's Code Development Process Hearings,

and most recently was present at the International Concrete Sustainability Conference in Washington, DC. NIBS, who has been leading the charge in Building Information Modeling (BIM), also produces Whole Building Design Guides and much more.

CMS ADOPTS NFPA 101-2012

On May 3, 2016, the Center for Medicare and Medicaid Services (CMS) updated the code from the 2000 version of the Life Safety Code to the 2012 Life Safety Code,

NFPA 101. Healthcare facilities are expected to update and comply with NFPA 99 and 101, respectively by July 5, 2016, unless otherwise specified in the final rule.

FCIA'S TRADE SHOW CIRCUIT—FIRE-RESISTANCE EDUCATION AND MORE

Through the spring, summer and early fall, FCIA's Marketing Committee builds awareness of the specialty firestop trade through speaking opportunities at conferences, *Life Safety Digest* in expo publication bins and FCIA's Trade Show Banners at convention exhibit halls.

Look for FCIA at the following events: Royal Architectural Institute of Canada Festival of Architecture (RAIC)—Booth, Publication Bins; NFPA's Expo—Booth, Publication Bins



and Presentation, Barrier Management Symposium—An Executive Summary; BOMA International Annual Conference & Expo—Publication Bins; IFMA World Workplace—Publication Bins; ASHE’s Annual Conference—Booth, Publication Bins; CONSTRUCT2016 - Booth, Publication Bins; ICC’s Building Safety & Design Expo—Booth, Publication Bin; and OFSEC—Publication Bins.

When FCIA Speaks at Conferences and Conventions, it results in greater awareness about how important fire-stopping with a firestop contractor, special inspection agency and high quality manufacturer can be for a structure’s safety. Plus, these events educate about firestopping and effective compartmentation—a vital fire- and life-safety service—through trade show booths and face-to-face contact.

CTL LAB IS FIRE TESTING AGAIN

CTLGroup is a large organization that is involved in ‘creative solutions to complex problems’ in engineering and materials science. CTLGroup’s fire testing services evaluate various concrete mixtures’ resistance to explosive spalling; to test various fibers’ ability to resist explosive spalling; to check the structural stability of post tensioned concrete slabs after fires; and to minimize construction costs by proving the resistance to explosive spalling. CTLGroup is a subsidiary of the Skokie, IL based Portland Cement Association.



GYPSUM ASSOCIATION CHANGES



Robert A. Wessel, PhD, FASTM, Senior Director, Technical Services at the Gypsum Association (GA) reported for duty for the last time. After more than 30 years of service to the Association and the industry, including overseeing every edition of the *Fire Resistance Design Manual* (GA-600) published since 1984, the man so many know from his work at the GA

and his decades of service to ASTM, answered his last technical call, packed his numerous ASTM service awards and headed towards home and a well-deserved retirement. Congrats Bob.

REPAIR OF FIRE RESISTANCE RATED GYPSUM PANEL PRODUCT SYSTEMS

The Gypsum Association’s GA-225-15 outlines how to patch single and multiple layer gypsum panel products used in fire-resistance-rated assemblies.

From the GA-225-15 document, “Small holes (such as those caused by a door- knob) can be repaired by patching. To maintain the integrity of the surface membrane, a gypsum panel product patch must be mechanically secured in the diaphragm; attachment with joint compound material only is not acceptable.”

Check it out at www.GYPSUM.org.

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FCIA 2016 INDUSTRY CALENDAR

JUNE

June 8–11

2016 RAIC Festival of Architecture
Vancouver Island/Nanaimo, BC
www.RAIC.org

June 13–16

NFPA Conference & Expo
Las Vegas, NV
www.NFPA.org

June 25–28, 2016

BOMA International Conference
& Expo
Washington, DC
www.BOMA.org

JULY

July 10–13

ASHE Annual Conference and
Technical Exhibition
Denver, CO
www.ASHE.org

SEPTEMBER

September 5–7

Oman Fire, Safety & Security Expo
(OFSEC)
Muscat, Sultanate of Oman
www.muscat-expo.com

September 7–9

CSI CONSTRUCT
Austin, TX
www.constructshow.com

September 11–13

Canadian Healthcare Engineering
Society (CHES) Annual Conference
Vancouver, BC
www.CHES.org

September 20–21

FCIA "DIIM" Symposium Canada
Edmonton, AB
www.fcia.org/articles/Canada2016.htm

OCTOBER

October 4–6

FCIA Fire & Smoke Barrier Firestop
and Effective Compartmentation
"DIIM" Symposium
Doha, Qatar
www.fcia.org

October 5–7

International Facility Managers
Association (IFMA) World Workplace
San Diego, CA
www.worldworkplace.ifma.org

October 11–13

UAE Fire & Smoke
Protection Symposium
Dubai
www.fcia.org

October 15–25

ICC Annual Conference and Public
Comment Hearings
Kansas City, MO
www.ICCSAFE.org

October 25–26

ASTM E06 Meetings
Orlando, FL
www.ASTM.org

NOVEMBER

November 1–3

Campus Fire Safety Forum
Mesa, AZ
www.campusfiresafety.org

November 8–11

FCIA Firestop Industry Conference
& Trade Show
Isle of Palms, SC
www.FCIA.org/articles/FIC_2016.htm

November 29–Dec. 2

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