

THE MAGAZINE OF EFFECTIVE COMPARTMENTATION

# Life Safety

## DIGEST

SUMMER 2020

Aging Infrastructure and Barrier Management

The Importance of Life Safety and Infection  
Control Risk Mitigation Strategies During Construction

Saving Lives Through ITM Deferral

FCIA's New Call to Action Initiative

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## EDITOR'S MESSAGE

This issue of *Life Safety Digest* focuses on health care occupancies.

This type of building has been like no other recently. It has been a safe haven for COVID-19 patients, nurses, doctors, and staff. There are many engineered systems – fire sprinklers, fire alarms, fire and smoke protection features, that keep these buildings safe. Fire-resistance-rated and smoke-resistant walls and floors are key to keeping these occupancies safe. Plus, the features of fire-resistance, including firestopping, fire dampers, and fire-rated doors, are all integral to maintaining these walls and floors as barriers to contain fire and smoke to the area of origin. Without them, and without properly maintaining them, people are at risk, regardless of occupancy.

At code development and other meetings, it can be heard said that 'sprinklers are reliable and limit fire to the object of origin'. Yes, that may be true, as long as those systems are activated – and that all systems work. But effective compartmentation is the primary line of defense that limits fire and smoke spread from the room of origin.

It seems our culture has an appreciation for maintaining sprinklers, detection and alarms, on a very regular basis. Other than in hospitals, are there occupancies where that same attention is paid to fire-resistance-rated and smoke-resistant assemblies? We're not sure!

That's our charge as *Life Safety Digest* readers – to educate everyone we see about effective compartmentation and its role in society. Effective compartmentation and passive fire protection create havens of safety, egress passages, and so much more. And, it needs to be maintained like any other building system to be effective and to protect as designed.

Check out articles in this issue of *Life Safety Digest* from hospital industry experts George Mills, Anne Guglielmo, and Jonathan Flannery. Each provides timely insights into safety for health care occupancies. Also, find out a bit more about our Platinum, Gold, and Silver Manufacturer members in the Manufacturer Spotlight feature. Each of the Manufacturers featured have provided information to help keep health care buildings safe.

We're living in unprecedented times. Now, more than ever, we see the importance and impact of properly designed, installed, inspected, and maintained effective compartmentation in health care facilities: it saves lives. Once the pandemic ends, the need for these critical systems will not have run its course. Effective compartmentation will always save lives. If we learn anything from this global disaster, let it be that ALL systems that protect human life are critical and must be properly designed, installed, inspected, and maintained so they can function as intended should they be called upon by smoke, fire, and now, pandemic.

Thank you for your support of *Life Safety Digest*. May you and your loved ones stay safe and healthy. 🔥

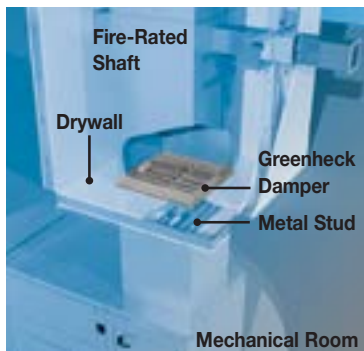


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## AGING INFRASTRUCTURE AND BARRIER MANAGEMENT

If we were having coffee and you asked me what I considered to be the major issue affecting healthcare, I might respond in several ways. I might first mention the 500,000 - 600,000 people that come into our hospitals each year and get a hospital acquired infection (HAI). I might further explain the fact that of those infected with a HAI, between 60,000 to 70,000 people may die annually. The CDC has identified the physical environment as a contributor to HAI.

Or I might respond to you with a question. How, during accreditation surveys, the surveyors seem to gravitate to the same issues that have little impact on the patient care environment? I cannot imagine how many adverse patient outcomes are linked back to wires on a sprinkler pipe. Carefully, I would avoid the temptation to get on a soapbox on the topic of how we should focus on the physical environment in which the patient and caregiver reside and work and its impact on them, rather than code requirements that do not impact or create a safe environment.

Or I might share my concerns about the aging infrastructure in many of our hospitals today, which is what I am choosing to discuss today.

In 1946, two Senators, Harold Burton and Lister Hill, sponsored the Hospital Survey and Construction Act under President Truman. This Act was re-branded as the Hill-Burton Act, and its intent was to create 4 ½ beds per 1,000 people. This resulted in disbursing \$3.7 billion dollars to hospitals, creating over 10,000 construction projects and nearly half a million new hospital beds. By 2000, the Hill-Burton Act had dispersed more than \$4.6 billion to more than 6,800 healthcare facilities in over 4,000 communities. When this Act ended, many new, small rural hospitals had been built. Following the Hill-Burton Act, many of these hospitals began to add wings and new technologies and grew in size and complexity.

Many of the original Hill-Burton Act funded buildings are still actively treating patients. Unfortunately, these same hospitals have typically struggled financially to compete. This results in reduced funds, making it difficult to maintain their building infrastructure. Hospital buildings prior to 1991 were not required to be fully sprinklered, so many were built with design criteria to shelter patients in place through building construction by creating compartments. These original compartments were required to be intact from the floor to the underside of the deck above to resist the passage of smoke or products of combustion. A government agency, the Health Care Finance Administration (HCFA), adopted the 1981 - and later the 1985 - edition of the Life Safety Code® (NFPA 101-1985), both of which supported this concept of building compartmentation.



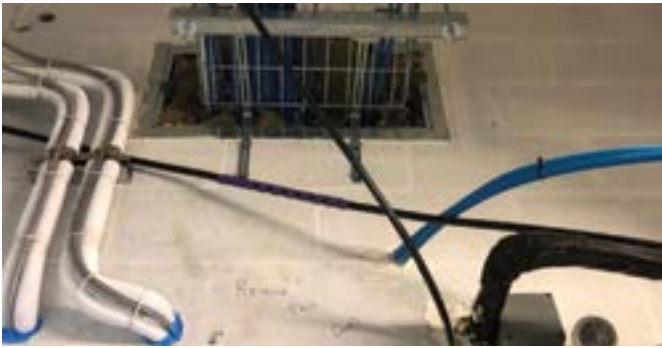
*Required compartmentation breached by cabling, pipes, not protected properly. K. Heckler Photo*

In 1993, the Joint Commission adopted the 1991 edition of NFPA 101, the Life Safety Code. This was the first edition of the Life Safety Code to require approved, supervised sprinkler systems for all new construction and renovation of healthcare occupancies.

The Joint Commission also later adopted the 1997 edition of the Life Safety Code, which continued to promote a sprinkler protected building. NFPA had evidence that a fully sprinkler protected building was a safer building, better protected from products of combustion than a building built with compartmentation as its primary protection. This resulted in some building reductions. For example, in a compartmentalized building, it is important to provide physical separation to protect the patient in their room from the corridor. However, in a building protected with an approved, supervised sprinkler system, the corridor walls are not required to extend from the floor to the underside of the deck above, as the approved supervised sprinkler system provides a level of safety to the patient.

Although HCFA (renamed in 2001 to the Centers for Medicare & Medicaid Services, also known as CMS) did not move from the 1985 edition of the Life Safety Code to the 2000 edition until 2003, the Joint Commission's proactive decision is responsible for the saving of hundreds of lives from fire-related deaths or injury. It has been proven that a building fully protected by an approved sprinkler system is, in fact, a safer building, providing more protection for its occupants. In 2016, CMS adopted the 2012 edition of the Life Safety Code, even though the 2015 was in circulation at the time.

An important feature to remember is that even as we have introduced sprinkler protection to our buildings, the Life Safety Code also continues to rely on compartmentation to ensure patient safety and to ensure that egress is maintained. The introduction of suites and smoke compartments create a series of barriers that must be maintained.



*New breaches need repair to maintain barrier fire-resistance-ratings and smoke-resistant properties. Fire dampers, fire doors, fire-rated glazing, and blank holes have requirements for maintenance in the International Fire Code, NFPA 1, NFPA 101, NFPA 80, and more. Even wall patches need to be fire-resistance-rated. The top image shows an improperly firestopped penetration. The bottom image appears to show a proper firestop installation, though it would have to be verified against the installed tested and listed system specs to confirm proper installation. Affinity Firestop Photos*

So, over our cup of coffee, I would be explaining the importance of the decision to adopt the right editions of the various codes, including the Life Safety Code, and the continued need to implement Barrier Management. With the advent of the sprinklered building in 1993, many sprinkler installations involved creating holes in walls that were required to be maintained as either smoke-resistant or fire-resistance-rated barriers. Over the past thirty years, many of these breaches have been repaired. And, as we get closer to facility-wide wireless systems in many buildings, the cycle of cabling our buildings also appears to be declining and nearing its end.



*Breaches in fire- and smoke-resistant assemblies are to be protected, continuously. Maintaining protection is mandated by fire codes. J. Sharpe Photos*

But our aging buildings continue to need upgrades and repairs. Original building systems are undersized to meet our current and future patient and building needs. Once again, the system of barriers will be challenged. It is extremely important that those responsible for maintaining our building compartmentation be included in early discussions so they can plan and execute repairs when access is available. As new systems are planned and installed, they will inevitably breach installed barriers. In many cases, this occurs late in the construction process, sometimes even after patient care services begin. This increases the need for close oversight of barrier management and interim mitigation activities.

Ventilation is now being recognized as a significant component in reducing the Hospital Acquired Infections mentioned earlier. In some situations, room wall breaches and cracks must be sealed for the ventilation system to perform to new specifications.

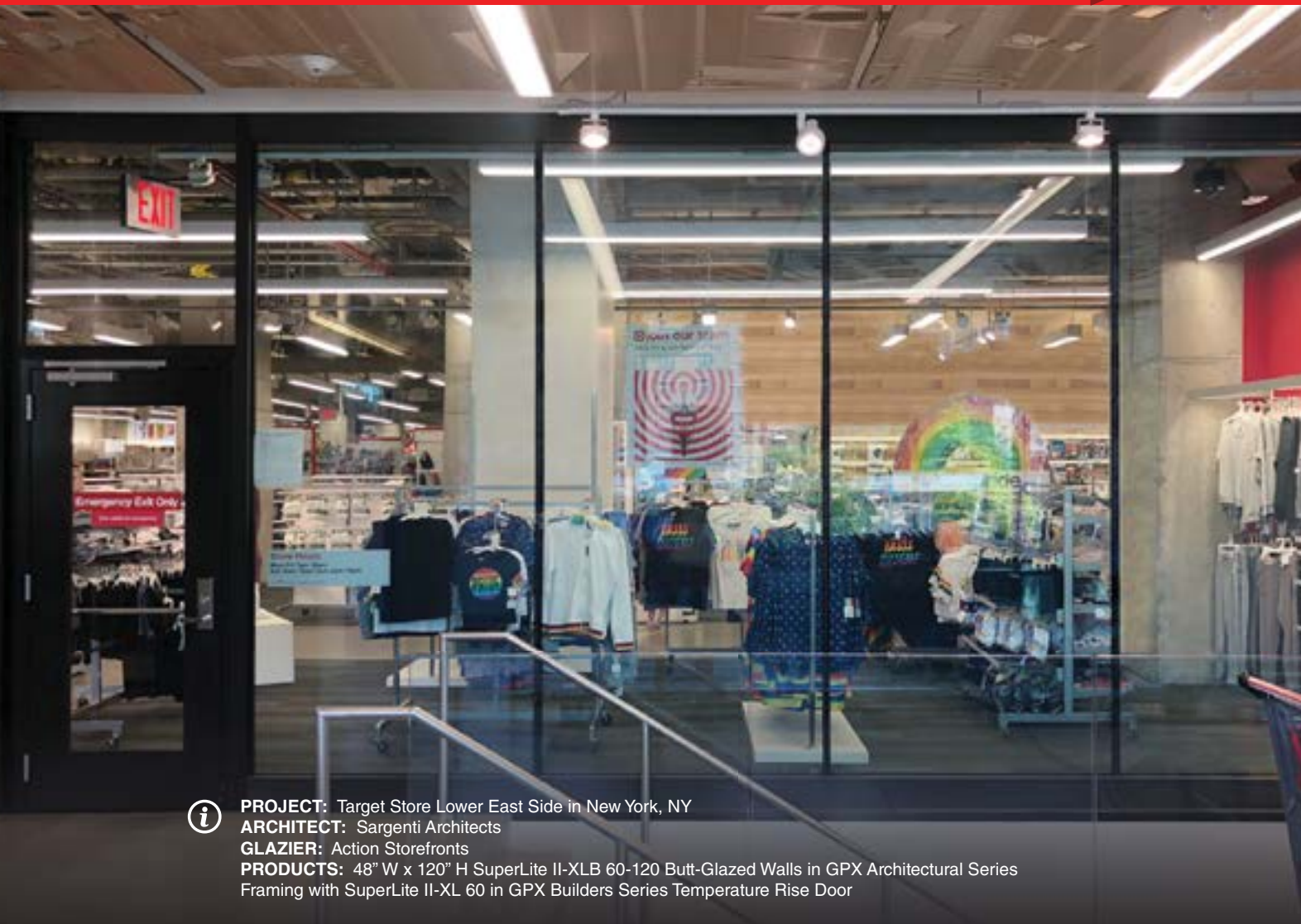
In addition to ventilation, other utility systems are being upgraded. Water management may require new piping runs. In some building locations, there is a need for additional electrical distribution. Telemetry and other computer-based equipment may also create breaches in the installed barrier system.

Plus, there is also a requirement to remove items improperly installed. For example, the wires on sprinkler piping mentioned earlier is a non-compliant condition. When these wires are removed, there will be holes in barriers that will need to be repaired.

It is clear that we need to be a team, coordinating our activities to ensure access to the barriers as the breaches occur and providing corrective actions as penetrations are identified. Compartmentation continues to be important, serving as areas of refuge for those that may be unable to protect themselves because of their medical or behavioral conditions. While adding approved, supervised sprinkler systems has been credited with saving lives by shortening the fire event, we must remember what can quickly hurt the occupant. Fire destroys the property, but smoke kills. Improper barrier management may result in loss of life because of the products of combustion. Our management of barriers is an incredibly important part of patient safety and building maintenance. As we strive to repair aging infrastructure and buildings to improve the patient care environment, we must be diligent in barrier management. Correctly designed, installed, and inspected barriers will create effective compartmentation. Proper maintenance of these barrier systems will ensure ongoing reliability for the life cycle of the building. 🔥

*George Mills is CEO, ATG and Director of Operations for JLL Healthcare. He can be reached at [George.mills@aj.jll.com](mailto:George.mills@aj.jll.com)*

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## THE IMPORTANCE OF LIFE SAFETY AND INFECTION CONTROL RISK MITIGATION STRATEGIES DURING CONSTRUCTION

**C**onstruction activities are a constant in healthcare facilities today. Construction projects are occurring throughout these facilities, including in patient care areas, main circulation spaces, and in areas to accommodate building expansions.

New projects can provide much needed additional space to deliver critical services, the opportunity to upgrade existing systems with newer technology and equipment, and a refresh for older spaces that no longer function in the most efficient ways possible. These project sites are a common source of deficiencies that the facility must address. Active construction projects are reviewed by Fire Marshals, Building Inspectors, and Accreditation Surveyors. Managing life safety and infection control issues created by these projects is vital in healthcare facilities.

### PLANNING, DESIGN, AND CONSTRUCTION AND FACILITIES MANAGEMENT

The CDC estimates that 1 in 25 patients are diagnosed with a Healthcare-Associated Infection each year. Ensuring that the physical environment is safe for staff, patients, and visitors should be at the forefront of all work that is done in healthcare settings. Healthcare organization Planning, Design, and Construction (PDC) and Facilities Management (FM) teams use several processes to properly assess the needed safeguards during construction projects. Maintaining compliance with building and life safety codes is required at all stages of project work. In addition to Code compliance, infection control practices must also be assessed and implemented throughout all stages of healthcare construction projects.

PDC and FM teams need to work closely with the healthcare facility's Infection Control (IC) team to ensure that the risks for infection are properly assessed and mitigated from project start to project end. The IC team should be involved from the first conceptual project planning meeting to the final walk-through before opening. The IC team provides unique insight to the specialized needs of the patient population served and can help to identify mitigation strategies that are needed for the specific construction project.

### THE INFECTION CONTROL RISK ASSESSMENT

An Infection Control Risk Assessment (ICRA) should be completed for every construction project in the healthcare environment.

The first step in the ICRA process is identifying the type of construction project activity that will take place. There are typically four categories of construction activity (Type A-D) that range from simple ceiling tile removal for inspection to full demolition and new construction.

The second step is to identify the patient risk group that will be affected by the project. This ranges from low-risk (office-type areas) to highest-risk (ORs, ICUs, Central Sterile Supply).

Step three matches the project type with the patient risk type to determine the project classification. IC control precautions, both during and upon completion of construction projects, are identified by project classification. This gives the construction team and contractors specific activities that must be implemented to minimize the spread of infection as a result of the construction work being performed.

Depending on the specific healthcare facility policy and ICRA, there are several additional steps to identify other considerations, like water mitigation, work hours (for disruption to patient care delivery), and HVAC strategy, including the use of HEPA filtration. Having an ICRA in place and following the mitigation strategies required by the assessment can have a significant impact in reducing the infection risk to patients. Activities that may seem minimal, like firestopping individual penetrations after a small IT project, can have a significant impact on the patient care environment.

### INTERIM LIFE SAFETY MEASURE ASSESSMENTS

Construction project work requires assessment to determine the impact it will have on Building and Life Safety Code compliance. The assessment process can have different names, but it is most commonly referred to as an Interim Life Safety Measure (ILSM) assessment, as required by accrediting organizations like The Joint Commission. Other names for these mitigation strategies include Alternative Life Safety Measures (ALSM), Substitute Life Safety Measures (SLSM), and Temporary Life Safety Measures (TLSM).

No matter what it is called, the goal of the Life Safety Risk Assessment is to determine what features of life safety the construction project will impact and the appropriate ways to mitigate those compromised features until the project is completed. ILSMs can include temporary construction partitions, additional fire-fighting equipment, fire watches, staff education and training, and signage for alternate exit routes where primary exit routes are no longer available. Ensuring the integrity of required fire and smoke barriers impacted by construction activities is key in maintaining the required building compartmentation afforded by the building's design.

It is important for contractors to be educated in the required life safety and infection prevention mitigation strategies that have been risk assessed by the Project Team. The Project Team has a responsibility to ensure that construction barriers are properly installed and maintained, that entrances and exits to the construction area are properly secured, and that

construction areas are kept clean and contain minimal debris. Contractors need to be educated on the mitigation strategies that are to be used and the expectations the facility has for contractor compliance. It is also important for contractors to be aware of the designated traffic flow, debris removal routes, and construction staff circulation routes. The ability to reduce the impact of the construction process on the adjacent patient care spaces is critical in maintaining the life safety and infection prevention mitigation strategies.

## INFECTION CONTROL DEFICIENCIES

The number of observations scored by accrediting organizations has been increasing over the last few years. Recently, it has been estimated that the number of infection control deficiencies scored due to construction projects has more than doubled over previous survey years. This is due in part to new focus being placed on construction activities and the need to ensure life safety and limit the spread of infection in the healthcare physical environment.

But, it can also be attributed to the speed in which construction projects are being completed. Construction timelines have shortened significantly in recent years. The demand for healthcare delivery space is great. In order to turn over projects quicker, project teams bring in more contractors, with a wide variety of construction workers from various disciplines present concurrently and increased project staging needs. These all create prime conditions for deficiencies to occur. Project teams need to be aware of the mitigation strategies that have been put in place and need to work together to ensure these strategies are being implemented.

Hospitals are most often cited for not maintaining construction barriers, unprotected and improperly protected penetrations in fire-resistance-rated and smoke-resistant barriers, improper pressure differentials in the construction site, and not following the ICRA and ILSM policies and risk assessments.

Proper containment of construction areas reduces the amount of dirt, dust, mold spores, and airborne contaminants that are released into adjacent spaces, thus reducing the IC risk. Project teams should be performing daily rounding activities to ensure that sites are safe and properly maintained. Contractors should pay attention to their surroundings, including areas beyond the construction work area. All entrances to the construction area should be tightly sealed when entering and exiting. If the Project Team requires daily rounding be completed by the contractor, documentation should be thorough, consistent, and communicated to the Project Team. Contractors



*Common deficiencies include wires not permitted to be attached to sprinkler piping and excessive door gap allowing particulate to leave the construction area. Credit: CCI*



*Typical plastic barrier installed for infection control purposes not properly secured and not closed after entry by contractor staff. Credit: CCI Photo.*

should be clear about the site conditions. If staff are not adhering to the required IC mitigation strategies, action should be taken to address the deficiencies. One of the purposes of daily rounding is to make sure each person is accountable for the safety of the project site and, ultimately, the patients being served.

## CONCLUSION

In light of the recent pandemic, infection prevention in the patient care environment has taken on a whole new focus. Many hospitals are implementing daily temperature monitoring of those working in the facility. Social distancing policies are being used to limit contact amongst those in the hospital, which can have implications on how contractors are performing their job functions. Adjustments to daily activities are going to be required. It is important to find out before work starts what the new expectations are for the environment work is being performed in. Contractors need to understand what the IC mitigation strategies are and how to comply. Every person working on an active construction site in a healthcare facility has a responsibility to ensure the facility policies and procedures are followed. If there is a question about IC and ILSM requirements, ask the Project Management Team. The healthcare facility teams are more than willing to provide training and education to contractors and their staff to ensure a safe construction site and safe patient care environment. 🔥

*Anne is a project manager at CCI with more than 20 years of Fire Protection/Life Safety Consulting Experience. Her healthcare experience includes design, construction, insurance, consulting and regulatory compliance.*

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# SAVING LIVES THROUGH ITM DEFERRAL

**A**s people with medical needs are cared for in increasingly diverse settings, disaster preparedness is not only a responsibility of hospitals, but of many other providers and suppliers of health care services. Whether it's trauma care or long-term nursing care or a home-health service, patients' needs for health care don't stop when disasters strike; in fact their needs often increase [during] a disaster," says Nicole Lurie, M.D., Department of Health & Human Services Assistant Secretary for Preparedness and Response. "All parts of the health care system must be able to keep providing care through a disaster, both to save lives and to ensure that people can continue to function in their usual setting. Disasters tend to stress the entire health care system, and that's not good for anyone."<sup>1</sup>

When it comes to emergency preparedness, Mark E. Etheridge, P.E., LEED AP, says "it's smart to sweat the small stuff". Etheridge is convinced that failing to pay attention to details and to analyze the potential impact of "what if" situations before an emergency occurs will cause unnecessary problems. As senior electrical engineer and a member of the health care leadership team at the engineering firm AKF Group LLC, New York City, Etheridge knows from experience that it takes more than following required guidelines to keep a hospital functioning during an emergency. Etheridge emphasized that point during his presentation "The Last Hospital Standing: Beth Israel in the Aftermath of Hurricane Sandy" at the American Society for Health Care Engineering's (ASHE's) International Summit & Exhibition on Health Facility Planning, Design & Construction (PDC) in 2013.<sup>2</sup>

While these two quotes seem to contradict each other, in reality they are the true compliment of what emergency management really is - an amalgamation of providing the safety and protection as noted by Dr. Lurie, while properly preparing for and responding outside of the required guidelines and standards when it is necessary to save lives. Never has this been more apparent than in the last several months while our nation has been responding to the spread of the SARS CoV-2 virus and the COVID-19 pandemic.

2020 has seen an unprecedented impact globally to many health care systems, from the near collapse of Italy's National Healthcare Service<sup>3</sup> to the profound shock to the United Kingdom's National Health Service (NHS<sup>4</sup>) to the huge influx of patients flooding the New York health care system.<sup>5</sup> The impact of this pandemic has been like no other emergency before.

Up to this point, most emergency responses have been based on a local response, as most disasters are local events (e.g., local surge, hurricane, earthquake, fire, or blizzard). Some disasters may impact significantly large geographical areas, but until now, none have impacted the entire nation and the world at large.

The large-scale response to this pandemic has invited a broader scope of perspective to emergency management. While surge response specifically is focused on local health care coalitions, the procurement and distribution of personal protective equipment (PPE) is happening on facility, coalition, state, regional, and federal levels. This multilevel approach has created confusion and frustration for many involved, especially for those in need of PPE.

The COVID-19 pandemic is impacting the health care physical environment in ways we never imagined. Facilities have been reimaged, renovated, expanded, enlarged, and underutilized simultaneously. The pandemic's significant impact on the physical environment has offered challenges and learning experiences. Our reaction to this emergency has required agile assessments, multiple mitigations, perpetual preparation, and rapid responses, and it will require a resolute recovery.<sup>6</sup>

So how does one strike an appropriate balance of safety and response to be able to properly protect those who are not only impacted by an emergency but are also responding to assist those in need of saving, protection, and care? Fortunately, this is something that health care facility managers are pretty familiar with and, in fact, is the basis of the National Fire Protection Association's Health Care Facilities Code, NFPA 99, which is a risk-based code. By focusing on the risk at hand through a risk assessment, the proper response can be implemented, while providing the needed safety for those involved.

With the 2012 edition of NFPA 99, the document went through a major overhaul. The premise of an occupancy document was modified to become a risk-based document. As explained in NFPA 99 the risk to a patient does not change...if the procedure is performed in a doctor's office versus a hospital.<sup>7</sup>

NFPA 99 is based on 4 categories of risk.

- Category 1 - Systems that, if they fail, would cause major injury or death;
- Category 2 - Systems that, if they fail, would cause minor injury;
- Category 3 - Systems that, if they fail, would not likely cause injury;
- Category 4 - Systems that, if they fail, would have no impact.<sup>8</sup>

While this is a fairly broad risk-base it provides significant guidance for the management of systems within the context of the health care physical environment.

In addition to the aforementioned risk categories NFPA 99, Chapter 12, Emergency Management, provides another key tool for risk assessment preparation which is known as the Hazard Vulnerability Analysis (HVA). The HVA is a process for identifying the hospital's highest vulnerabilities to natural and man-made hazards and the direct and indirect effect these hazards may have on the hospital and community.<sup>9</sup> While there are a variety of formats for HVA's used by health care organizations, all of these use a risk probability versus a risk impact or consequence to determine the priority of hazards for an organization to consider.

While this may appear to be a simple mechanism by defining the level of probability versus the potential consequences a risk assessment matrix provides a basis to assist in management decision making which in turn allocates the limited resources to the most probable and impactful issues. This allows for the organization to properly prepare for and mitigate the impact prior to an emergency event.

So, what would a risk assessment matrix look like for determining which physical environment codes or standards should be modified or deferred during an emergency? This matrix would need to be able to do a multivariate assessment with a comparison of the probability of and the impact from an event that the code or standard is established to avoid compared to the probability of the implementation of the code or standard on the ability to protect life and provide essential services during the emergency. This analysis would provide a comparison for the continued enforcement of the code or standard to the impact it would have on the ability to protect patients and staff and their ability to provide the necessary services for the patient's well-being.

A great example of this is the code requirement for the testing of fire/smoke dampers. While this is an extremely important test to verify that these devices properly function and fulfill their purpose of limiting the spread of fire and smoke, one can readily understand that initiating this test and the impact it would have on a ventilation system during the COVID-19 pandemic. This could cause a serious negative outcome for staff and non-COVID-19 patients at a hospital. Understanding the probability of and the possible extent of spread of smoke and fire in a fire event within a patient care area of a hospital is a very important part of this comparison.



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### Loss Measures for Hospitals and All Other Medical Facility Fires (Three-Year Average, 2012-2014)

Loss Measure	Hospital Fires	All Other Medical Facility Fires
<b>Average Loss:</b>		
Fatalities/1,000 Fires	0.4	0.6
Injuries/1,000 Fires	17.3	19.6
Dollar Loss/Fire	\$6,030	\$11,290

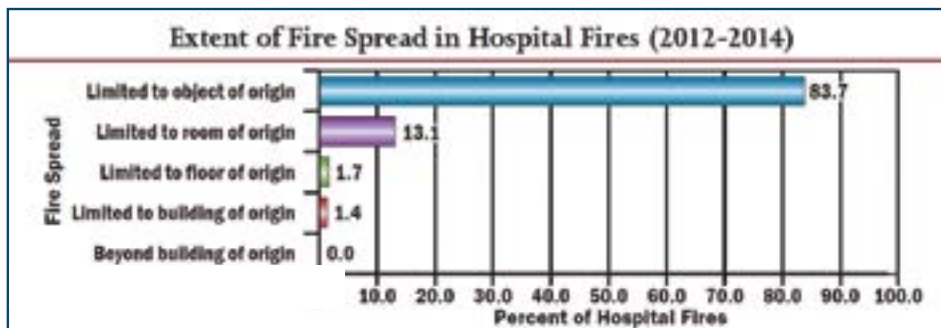
Source: National Fire Incident Reporting System (NFIRS) 5.0.

The average number of fatalities per 1,000 hospital fires was lower than the same measure for all other medical facility fires. In addition, the number of injuries was also lower than that of other medical facilities.<sup>2</sup>

According to the Federal Emergency Management Agency (FEMA) National Fire Incident Reporting System (NFIRS) Data Snapshot during 2012-2014 approximately 1,100 hospital fires happened annually with an average fatality/1,000 fires of 0.4 and injuries/1,000 fires of 17.3. Even more important to understand is that 68% of these fires were cooking fires and 83.7% were limited to the object of origin.<sup>10</sup> These compelling facts clearly indicate that if there was a fire during the pandemic the probability of the fire or smoke spreading throughout the hospital and causing harm is fairly unlikely. While the consideration of the impact of shutting down the ventilation system by testing the damper or the impact to the lives of the COVID-19 patients to close down the patient care area to avoid the impact during the pandemic would be significant and could even cost several lives for any given facility.

While previous to the COVID-19 pandemic ITM requirements have not been waived, the practicality of doing so at this time has undeniably saved lives and helped to avoid the exposure of potentially thousands of individuals to the SARS-CoV-2 virus. By allowing the deferment of fire alarm testing alone has helped to keep those third party contractors from being potentially exposed to the virus while performing ITM in hospitals.

While this is an unprecedented initiative it should be noted that ASHE encouraged that the ITM efforts be deferred for the duration of the pandemic and that a specified window of time be considered for completion after the state of emergency is over. This was important to be able to allow for proper completion of the ITM requirements after the pandemic without impacting patient care.



Source: NFIRS 5.0 Note: Total percentages do not add up to 100 percent due to rounding

It can also be reasonably considered that future large scale or long duration events could also warrant similar actions. ASHE stands ready to assist in these efforts and to engage stakeholders in the creation of health care environments that are optimal for healing. By deferring ITM, an important effort required to provide patients, staff and visitors an acceptable level of safety and quality of protection, CMS has allowed for patient care requirements and the protection of hospital and ITM providers to also receive an acceptable level of safety and protection at this time. 🔥

It was assessments of this nature that encouraged ASHE to recommend its members request waivers under Section 1135 of the Social Security Act in relation to the delay of inspection, testing, maintenance and certain drills required by the Centers for Medicare & Medicaid Services (CMS) during the pandemic.

Fortunately, CMS has also seen the wisdom in these requests and has issued a blanket waiver for certain physical environment requirements for hospitals to reduce disruption of patient care and potential exposure/transmission of COVID-19.<sup>11</sup> While this waiver allowed for the adjustment of scheduling of ITM frequencies and activities it can be seen that a risk based assessment was used in its consideration since CMS did not waive fire pump, portable fire extinguisher, elevator firefighter recall, monthly emergency generator testing nor the daily inspection of the means of egress within construction areas due to the consideration that these ITM items are considered critical.

*As the Senior Associate Director of Advocacy, ASHE, Jonathan manages ASHE's advocacy relations to federal agencies, code development organizations, and national professional associations that affect healthcare facility design, construction, and operation. Jonathan provides testimony, engages in deliberation, and develops public comments on proposed regulations to the benefit of ASHE and AHA members. Jonathan has over 30 years of health care experience including more than 20 years as a facility health care engineer.*

FOOTNOTES:

- <sup>1</sup> CMS finalizes emergency preparedness rule, Morgan, Jamie, Health Facilities Management, 9 Sept 2019, accessed 6 May 2020 at: <https://www.hfmmagazine.com/articles/2440-cms-finalizes-emergency-preparedness-rule>
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- <sup>3</sup> How COVID-19 is pushing the Italian healthcare system to the brink of collapse, Parkinson, Gary; Carbonaro, Giulia, CGTN, accessed 6 May 2020 at: <https://newseu.cgtn.com/news/2020-03-20/How-COVID-19-is-pushing-the-Italian-healthcare-system-towards-collapse-OZQOf0fgT6/index.html>
- <sup>4</sup> COVID-19: Five dimensions of impact, Thorlby, Ruth, Tinson, Adam, Kraindler, Joshua, The Health Foundation, accessed 6 May 2020 at: <https://www.health.org.uk/news-and-comment/blogs/covid-19-five-dimensions-of-impact>
- <sup>5</sup> New York is the epicenter of the COVID-19 pandemic + 21 other updates from the 6 hardest-hit states, Concon, Alan; Vaidya, Anuja, Paavola, Alia, Becker's Hospital Review accessed 6 May 2020 at: <https://www.beckershospitalreview.com/public-health/new-york-is-the-epicenter-of-the-covid-19-pandemic-21-other-updates-from-the-6-hardest-hit-states.html>
- <sup>6</sup> COVID-19 Recovery, Introduction, American Society for Health Care Engineering, accessed 6 May 2020 at: <https://www.ashe.org/covid-19-recovery>
- <sup>7</sup> NFPA 99 2012 Edition, Health Care Facilities Code, Origin and Development of NFPA 99, Page 99-3, Copyright 2011, National Fire Protection Association
- <sup>8</sup> NFPA 99 2012 Edition, Health Care Facilities Code, Origin and Development of NFPA 99, Chapter 4 Fundamentals, Page 99-25, Copyright 2011, National Fire Protection Association
- <sup>9</sup> What is a Hazard Vulnerability Analysis (HVA)?, California Hospital Association, accessed 6 May 2020 at: <https://www.calhospitalprepare.org/post/what-hazard-vulnerability-analysis-hva>
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- <sup>11</sup> CMS COVID-19 Emergency Declaration Blanket Waivers for Health Care Providers, accessed 6 May 2020 at: <https://www.cms.gov/files/document/summary-covid-19-emergency-declaration-waivers.pdf>

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# FCIA ANNOUNCES NEW CALL-TO-ACTION INITIATIVE

**A**t this spring's Virtual ECA '20 Conference, FCIA leadership launched a new initiative to get fire and life safety improvements using the FCIA's 'DIIM' for Existing Buildings.

Ben Urcavich, 2020 FCIA Board President, stated, "The world pays attention to sprinklers and alarms, what about effective compartmentation and its many benefits? How many ceiling tiles have we all moved and found breaches in important fire and smoke barriers that are there to protect people from fire, smoke and air migration?"

"FCIA Members provide the services needed - with knowledge enough to be responsible individuals in firestopping and effective compartmentation - helping keep buildings safe for all."

He continued, "We need the whole firestop industry - Specialty Firestop Installation Contractors, Manufacturers, Special Inspection Agencies, Distributors, Manufacturers' Representatives, and Friends of FCIA to help in this challenge. We already see FCIA Members taking action and delivering new webinars to educate about the importance of our industry."

"If everyone at FCIA educates someone about what firestopping and effective compartmentation is - and the importance of our industry - we'll make a difference in the demand for safe buildings delivered by FCIA Members," said Ben.

FCIA has already started to help its members with this initiative to help make existing buildings safe. FCIA's Committees developed and are refining educational content to help FCIA Members protect breaches - all of them - in existing buildings. FCIA Member Specialty Firestop Installation Contractors understand the concept that fire-resistance-rated and smoke-resistant assemblies are different from "regular" non-rated walls. They need to be repaired so that listed systems are not compromised. Fire doors need to be inspected annually. Fire dampers need to be checked every 6 years in hospitals, every 4 years in all other occupancies. Firestopping needs to protect breaches made for new services in buildings. And, L-Rated firestopping - and the smoke and sound sealants - might be a way to protect non-rated assemblies that need to stop air movement from room to room.

FCIA's call-to-action for FCIA Members - and *Life Safety Digest* readers - is to get ready now before buildings are opened again.

"Get ready now by building lists of potential buildings where people and property need to be protected," stated Urcavich. And, this list of buildings is bigger now than it used to be. Be ready to contact these facility directors in ways you might not have before - social media, email lists from associations, and more.

Then, contact ALL types of existing buildings, not just hospitals, with an important question - have you visually inspected your fire-resistance-rated and smoke-resistant assemblies?

Then, talk about the greater protection firestopping and effective compartmentation provides against air movement and the things air can carry. Do it as soon as possible to get lined up prior to the COVID-19 crisis ending and before people start to occupy public spaces. Keep in mind, these conversations might involve non-fire-resistance-rated operations as well.

FCIA is here to help you get ready to protect existing buildings. We have the new Barrier Management Services section of [FCIA.org](http://FCIA.org) where Barrier Management Services providers can be found. We have a lot of educational material already in the Barrier Management Symposium at [FCIA.org](http://FCIA.org), and watch for even more in the near future. 🔥

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## ASTM E2307

### What It's For & How to Meet It

All buildings need measures to prevent the spread of any fire, but the nature of a high-rise building requires additional considerations due to the greater height. For instance, all buildings move due to thermal expansion and contraction, seismic activity or changes in dynamic loading as people, vehicles and equipment move throughout. High rises are subject to all of these plus another factor for movement – the curtain wall is pushed and pulled by wind forces. While these curtain wall joints, or perimeter joints, have certain gaps designed to allow for this movement, the gaps must be firestopped against the spread of fire and smoke. The governing standard for materials used in perimeter joint applications is **ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus.**

ASTM E2307 describes methods and criteria to measure the fire resistance of materials used as perimeter joint protection (perimeter fire barriers) and determine their ability to prevent the spread of fire from floor to floor within the building. Since curtain walls are typically not tested in accordance to ASTM E119 (Standard Test Methods for Fire Tests of Building Construction and Materials), there is an added component of severe deflection and deformation of the exterior

wall or even flame propagating through to the exterior side of the wall assembly. The test method accounts for this by also subjecting the assembly to fire exposure from an exterior flame plume. By subjecting the perimeter fire barrier and adjacent assemblies to both interior fire exposure from the floor below and the exterior flame plume, the intent is to simulate possible real-life fire exposure conditions.

### Resisting Both Fire & Separation

In order to meet the standard set by ASTM E2307 not only must the gap be filled with a fire resistive system, but the material filling the gap must be flexible enough to move with the building without cracking, peeling away from the substrate or leaving any other gaps through which fire and smoke might spread. There are many types of caulks and sprays that are rated to perform this function. Another option is firestop tape such as 3M™ Fire and Water Barrier Tape, which in essence is a pre-cured version of a firestop sealant or spray. Not only does it have excellent flexibility and movement capabilities, it also features an aggressive adhesive that bonds to a wide variety of common construction substrates.

When contractors install firestop caulk or spray, they apply it in accordance with a very prescribed UL, Intertek or other third-party system. For example, one particular system may require a 1/8-inch

thick caulk or spray depth, so the installer has to be very precise in installation to achieve that exact thickness. In this scenario, if the 1/8-inch thickness is not achieved, then a true firestop system has not been installed. There is a possibility that the application could fail in the event of a building fire with disastrous results, and at a minimum it would fail inspection by an AHJ-approved Special Inspector. On the other hand, if the installer accidentally over-applies, then the result is a waste of materials. This outcome is much less severe, but still not ideal: just like anyone in any industry, contractors have to consider the cost of materials, so waste has an unfavorable impact on profitability.



3M Image

## Build Smarter With Fire-Resistant Tape

Tapes have not traditionally been used in fire protection, but when you examine the benefits, it's hard to see why someone wouldn't use a tape in place of a caulk or spray. It is a revolutionary concept that something as simple as a piece of tape could provide a barrier against fire, smoke, sound or water, but sometimes simple things can be the most effective. The reasons to use 3M™ Fire and Water Barrier Tape as an alternative to caulks or sprays are abundant.



**Consistent.** Maybe most importantly, tapes provide a consistent installation throughout the entire application. The installer never has to worry about whether tape is over-applied or under-applied: the thickness is predetermined so installers can select the exact size for their specific projects. Not only does this aid in installation, it also makes for easier inspection. Even when a section of the joint must be cut out to inspect the mineral wool, repair is as simple as just placing a new piece of tape over the affected area.



**Cost Effective.** By using a tape, installers minimize the risk of over application so they can purchase exactly the amount of material they need. One 8" x 75' roll of tape is approximately equivalent to a five-gallon pail of spray installed at 1/8" thickness (assuming no spray waste), which can allow installers to reduce the intensity of the labor associated with firestop installation. Tapes are also portable and require less installation equipment such as spray rigs and pails of spray. This allows installers to move more quickly from floor to floor and even within the same floor to get more done in a day.



**Efficient.** In addition to less equipment to cart around, installers get additional time back in their days because there is no set-up time and hardly any cleanup or waste disposal required. Construction is an industry where time is of the essence so getting rid of tedious steps like preparation and cleanup can be extremely helpful in moving on to the next project quickly without sacrificing the quality of the work. Tapes can also handle hot or cold weather installations: 3M™ Fire and Water Barrier Tape and 3M™ Smoke and Sound Tape can be installed from 0°F all the way up to 150°F. This means that work can continue even during extremely cold conditions with no need to halt the job because it's too cold or to provide costly heat to continue work.



**Sustainable.** As the world grows more and more environmentally aware, installers have to consider regulations that could affect the products they are using. Tapes have no VOCs and very low emissions, unlike some standard wet sprays. When using a tape, no noxious chemicals are released into the environment, making it a clean application all around.

## One More Reason to Tape

In addition to being an excellent way to meet ASTM standard E2307 for the spread of fire, tape can also prevent the movement of water. A recurring problem in the construction industry is rogue water exposure during construction, which washes out water-soluble firestop caulks and sealants and migrates through floor penetrations or joints to lower levels. This is addressed by sealing certain floors with watertight firestopping materials. Silicone firestop products can be used for these watertight levels, but they can be messy to apply and if they're sprayed the greater viscosity can be hard on the pump. Since they are not water-soluble they also require solvents for cleanup. An alternative solution is 3M™ Fire and Water Barrier Tape, which is immediately watertight and wash-out resistant, and is also easy to apply with no need for pumps or the associated cleanup.

To recap, ASTM standard E2307 describes methods and criteria for measuring the fire resistance of perimeter fire barriers and provides for testing against both interior fire exposure from the floor below and an exterior flame plume. Because these perimeter walls are designed with gaps to allow for normal building movement, those gaps must be filled with materials that are both fire resistant and able to move with the building without cracking or peeling away to create an opening for flames or smoke. 3M™ Fire and Water Barrier Tape is an excellent solution, providing fire resistance in a format that is flexible and capable of moving with the building. This tape is also immediately watertight and has an aggressive adhesive that sticks to most common construction substrates.

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## **HILTI'S *Through Penetration Firestop Systems Tested to Withstand Movement***

### **Hilti becomes firestop manufacturer to market with UL certified systems with M-ratings**

Testing standards are continuously evolving and published to accommodate the expanding needs of the commercial construction industry and ultimately, improve life safety. One of the more recent industry concerns is the movement that can occur over the lifecycle of a building beyond the normal rigid support of penetrants through a rated assembly, which may impact the performance of firestopping. In November 2016, the ASTM E3037 Standard Test Method for Measuring Movement Capability of Through-Penetration Firestop Systems was issued. The intent of the standard is to provide a standardized method to assess the ability of firestop systems to experience movement and continue to be relied upon to perform their firestopping function.

Hilti understands the importance of having a method to consider movement and the impact on firestopping. The company does things differently – Hilti creates technologies, software and services that clearly stand out. Hilti runs their own research and design labs, working with top technical universities and partners all over the world. Products are manufactured in Hilti factories and with external partners, ensuring that all products match the same high quality and standards. Hilti conducts their own firestop testing in their in-house labs, following the most stringent standards and approvals. A privately-owned group of companies, Hilti was founded in 1941 by Martin Hilti and still held by the Hilti family today. Partnering with a handful of other manufacturers and collaborating with UL to create a certification program based on the ASTM E3037 Movement penetration standard was important to Hilti.

The intent of the certification program is to assess the movement capability of through penetrations such as pipes and cables passing through rated assemblies. In December 2019, the certification criteria were published, which include M-ratings to quantify the amount of movement that penetration firestop systems have been tested to achieve.



*Movement test in parallel. Hilti Image*



*Movement test in perpendicular. Hilti Image*



*View UL certified systems Hilti Image*

In order to certify to these criteria, firestop systems go through a two-direction cycling test, where through-penetrations are tested in both perpendicular and parallel direction to represent movement that can be experienced over the lifetime of a building. This is followed by a standard fire test. The results quantify the amount of movement firestop systems can accommodate while still performing as intended in the event of a fire.

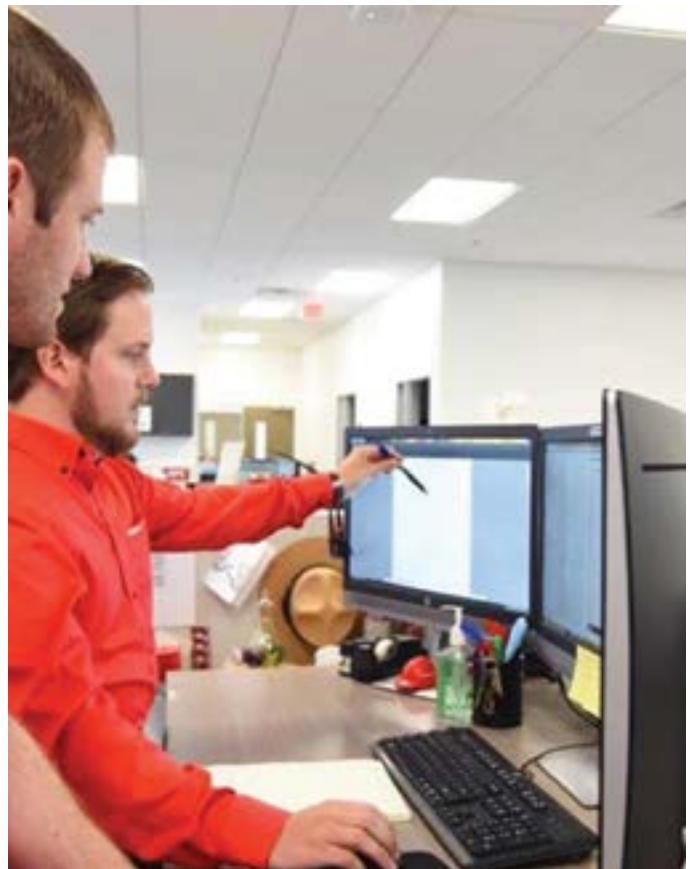
In-house testing for international approvals Hilti conducts thorough firestop tests in their in-house lab, following the most stringent international ASTM test standards, UL certification programs and much more.

Hilti understands the significance of this new criteria and used their in-house testing lab to help provide assurance that certain firestop systems perform as intended over the lifecycle of a building, even after taking movement into account. Hilti has tested and certified a variety of its systems for movement, from those that use sealants, such as FS-ONE Max, to those that use preformed devices, such as the speed sleeve CP 653 or firestop blocks CFS-BL.

Whatever the project and firestopping needs, Hilti's network of experts can help deliver solutions. Three decades of firestop experience working with local codes and guidelines have equipped Hilti to help provide solutions on virtually any project, anywhere. [Visit Hilti for more information.](#)



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*Firestop experience and expertise Hilti Image*

## Case Study Provided by [RECTORSEAL](#) and [BALCO](#)

Medical Center of Trinity - Observation Unit  
Trinity, FL, USA

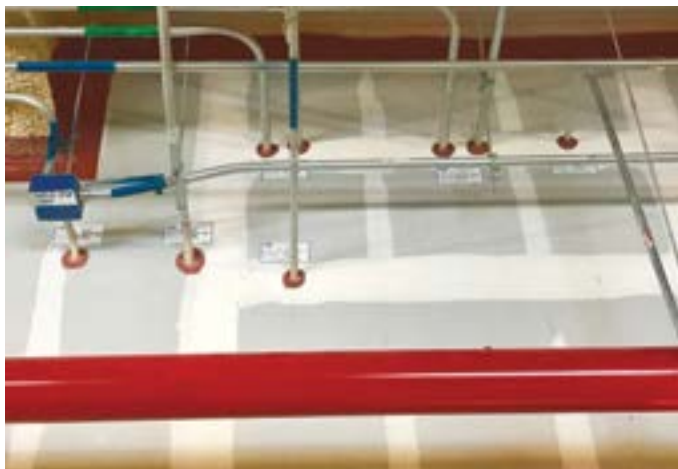
After a little over a year, construction work on the new addition to the Medical Center of Trinity in Trinity, Florida has wrapped up. Contracted through the Wal-Mark Contracting Group, this project was the completion of a fifth floor with shell space of an additional floor for future hospital expansion. The job required several crucial, life-safety components, such as firestopping of penetrations, fire-rated expansion joint systems and photoluminescent egress markings. All components were able to be supplied by leading manufacturers Balco and RectorSeal. From product selection and material supply, to technical support and engineering judgments, Balco and RectorSeal were heavily involved with every aspect of the process to ensure the best solutions.

Several RectorSeal firestopping products were supplied to meet the unique challenges on this project. From head-of-wall spray firestop to metallic and non-metallic pipes, HVAC ducting, and electrical cabling, different products with individual UL listings were supplied. In addition there were several shared openings used by the various trades that required UL listings and engineered judgments to satisfy. With RectorSeal's wide range of chemically compatible firestopping



Photocredit: RectorSeal Photo

products (which are UL listed & classified and FM approved) and decades of technical experience, RectorSeal was able to develop and issue design recommendations which met with the approval of both the Project Designers and local building approval authorities. The products used on this job were the Metacaulk® 1200, Metacaulk 1000, and Metacaulk 150+.



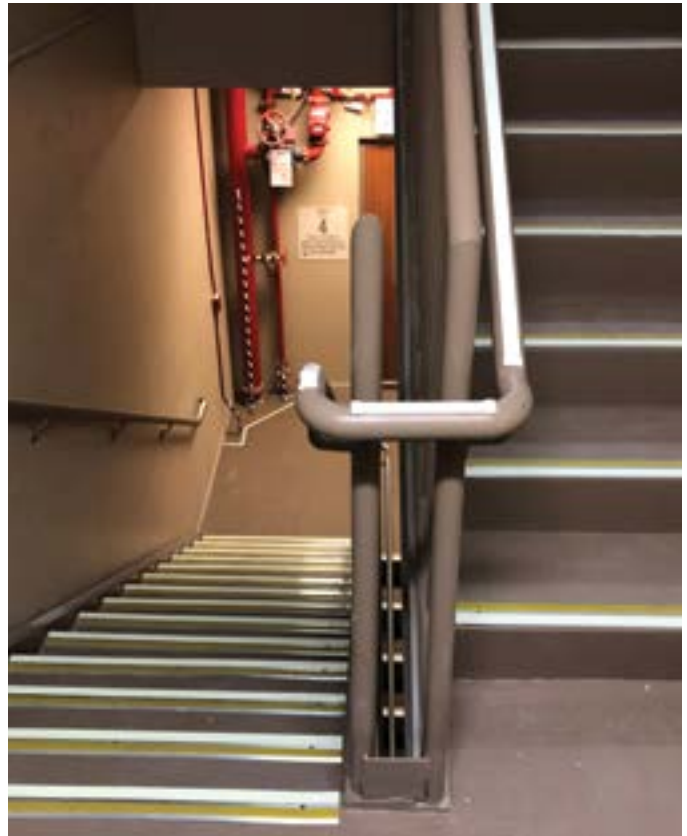
Photocredit: RectorSeal Photo

Balco provided the BHS/BHSL expansion joint system with the 3-hour MetaBlock fire barrier to meet the Florida state 3-hour fire rating requirement for all hospital floor expansion joints. For the wall joints, Balco's WD expansion joint system with 2-hour MetaBlock wall fire barrier were used to meet the two hour rating requirement. MetaBlock provides ease of installation for the contractor, including at the transitions from the floor to the wall where the fire rating must be maintained. Balco also provided a solution for the vertical expansion joints of the exterior walls on this project: the high-performing, pre-compressed foam seal, BCSW.



*Expansion Joint System Photo Credit RectorSeal*

Additional safety solutions were provided by Balco's IllumiTread™ line for egress stairwells. The photoluminescent exit path markings applied included the markings for handrail, landing and doorway demarcation, stair nosings, directional signage, and floor identification signage. Collectively they comply with International Building Code requirements by promoting intuitive, safe egress of occupants (and navigation for first-responders) in the event of a loss of power in an emergency.



*Photoluminescent Egress. Photo Credit RectorSeal*



*Expansion Joint System Photo Credit RectorSeal*

As the project of the Medical Center of Trinity showcases, both Balco and RectorSeal were essential linchpins in ensuring a safe, code-compliant addition to the hospital. These solution-based companies offer the most comprehensive life-safety products to meet specific needs, regardless of the customer.



## BUILDING A COMPANY WITH A SOUL

FEATURING **CHARBEL TAGHER**  
Co-Founder & President, Specified Technologies Inc.

*Entrepreneurship is part of the American Dream. But even in a stable economy, most start-ups don't survive. In these fluid times, established companies too are experimenting to find greater resilience and flexibility. The co-founder and CEO of Specified Technologies, Inc., Charbel Tagher, shares some of what he has learned over 30 years nurturing a start-up in the construction industry to its thriving maturity today.*

### WHAT IN YOUR MIND ACCOUNTS FOR STI'S RISE FROM A 2-PERSON START-UP 30 YEARS AGO TO ONE OF THE MAIN PLAYERS IN THE FIRESTOPPING INDUSTRY TODAY?

*In a few words: We always cared more. And we still do.*

Jim Stahl Sr. and I started STI intent to make a difference. Thirty years ago, firestopping was an emerging sector of the construction industry. It aimed to save lives, but the practice itself was a bit of an enigma, with little technical clarity, almost no enforcement, few knowledgeable contractors, and products that were solvent-based. You had to wear a mask and gloves to use them, and a five-gallon pail of firestop sealant would sell for about \$450.



*STI's first office in Pennington, NJ - where Jim Stahl Sr. invented the intumescent two-stage water based technology in 1990.*

We knew we could do better, and we launched in 1990. Jim was a brilliant engineer who by then had been dabbling with water-based products for close to 20 years and had a good understanding of the nascent firestopping industry. And I brought some relevant management experience: after many years at McKinsey advising companies what to do, I ran a division of a mid-sized company (T&B) that included a microscopic firestopping line. That's where Jim and I met.

Together, we had a clear goal: to build a company that would make a difference and be different. We envisioned a premier technology company, a thought leader who would help advance

the science and art of firestopping. A company that would in time become the preferred choice of the people in our industry: That's where the check mark in our logo and the words Specified Technologies come from.

We realized that customers would first have to give our tiny start up a shot in the shadow of the giants of the time (3M, GE, Dow Corning, Hilti). And that's when our caring transformed into committed policy: to make innovative and better products, add value the giants couldn't or wouldn't, make it enjoyable for our customers to interact with us, and most important, to continuously improve safety while helping our customers succeed at what they do. We also decided that we would make our products in the USA (I feel a special debt to this country), which we have for 30 years now, even though we export to around 50 countries, including China.

To start with, we patented and introduced a new, safe, and superior technology: the water-based two-stage controlled expansion. It allowed simpler and better solutions that covered a wider range of applications. And we did our best to provide outstanding sales and technical support so that end users had their questions answered very quickly and would get Engineering Judgments by highly qualified personnel. Over the years, to make sure we provided safe and excellent solutions, we tested extensively. We started with 12 UL Systems and if I remember well, 3M, the market leader, had 48 UL Systems. In fact, the whole industry had around 100 UL Systems! I'm proud to say that STI today has around 1,650 UL Systems—more than anyone else by a long shot. We've also made it very easy for our customers to pick the right UL systems on our website. And we put powerful search engines in place that allow our engineers to search our databases very efficiently. So, when we provide an Engineering Judgment, we know what we're talking about. And when we refuse to provide one, it's for the same reason.

A few years ago, we had an opportunity to hire some wonderful and very talented engineers who wanted to remain in Tulsa and were forced to resign their positions. We had not expected to have such an opportunity and had not budgeted for it. But we did not hesitate to hire them, opened an office in Tulsa, and seamlessly integrated them into our team. Their presence has helped propel our engineering support from great to elite while fulfilling their personal needs.

Another strategic policy choice flowed out of our commitment to caring: To prioritize solutions over sales. We saw that often firestopping problems were just a symptom and that customers needed help addressing problems in a lasting, holistic manner. STI products that were integrated within a practical framework made it easier for them and other industry players to solve their problems with a solution, not just tubes of caulk. The industry's performance, as well as STI's, went up with our policy choice. It gave our business a huge head-start with programs such as the Barrier Management Program, EZ-Path, Firestop Locator, and Submittal Builder.

Most importantly, we hired smart people with the right attitude, and invested in them. We did our best to make sure internal and





*"We envisioned a premier technology company, a thought leader who would help advance the science and art of firestopping."*

external communications were open, honest, fast, and respectful. Colleagues (and customers!) who feel empowered and valued stay a long time and contribute out sized value to the company and the industry. More than half our people have been with us over 10 years. Most of the senior people have been around more than 15 years. Longevity and continuity have allowed us to develop a strong middle management bench in all disciplines and deeper relationships with customers.

That's how we could continuously fulfill our purpose to advance the state of the art; create new firestopping segments and products, as we did in Curtain Wall and data cable management; and provide a whole new approach for the healthcare industry. We also realized the importance of sharing our knowledge with the industry, and within a decade or so STI became the "Firestop University," with programs such as the FIT 1 and 2, which have become the standard of our industry.

But we also did not hesitate to turn to other experts as needed. For example, in 1997, we realized that hospitals needed a holistic approach to solving their firestopping issues. But we were unfamiliar with their nuanced requirements and needed help. So, we turned to top-notch consultants that included Doug Erickson, George Mills and Mike Kuechenmeister. For two years, they taught us the challenges that facility managers confront in hospitals and helped us develop the Barrier Management Program. What started as a thick binder is now a very powerful, cloud-based set of tools extensively used by hospitals.

I would also be remiss not to mention the important contributions of the FCIA and IFC to the firestopping industry. As proud members of both associations, we have worked hand in hand to learn from each other, advance our common interests, and raise the level of firestopping education in the industry.

## **WHAT DO YOU THINK ARE SOME OF THE KEY DIFFERENTIATING FACTORS WITH YOUR COMPETITORS?**

The most important one, which has always sustained everything, is commitment. That's a very hard one to copy. I think STI stands out in our industry for its continuity of vision and people. Customers and business partners let us know how valuable those relationships are to them and their success. In contrast, big companies change focus and people all the time. That puts the burden back on the customer.

The second most important one is our in-depth knowledge of all aspects of firestopping and ability to turn it into added value. Customers and other industry members rely on us to keep their own performance ahead of the curve in terms of value, fire safety, and productivity. Again, our customers tell us this is a

huge differentiating factor. We are careful to continuously build on years of in-house technical research, testing, gleaning insights from the tens of thousands of interactions we have with end-users every year, sharing our knowledge with the industry, and learning by working hand in hand with contractors, designers and facility owners. You can't build this body of knowledge when you turn over your workforce all the time.

*Commitment and continuity—all the rest derives from there.*

## **STI IS OFTEN REFERRED TO AS A "COMPANY WITH A SOUL". WHAT DO PEOPLE MEAN BY THIS?**

Indeed, I've heard that from many of our customers, employees and business partners. It is a compliment that's music to my ears because that's exactly what Jim Sr. and I wanted to create, and our people live those values to ensure it is so. Basically, we do business by practicing the right attitude and values. We care about people and about safety, and we show it in our consistent actions.

The bottom line is that we do not see our relationship with our employees and business partners (contractors, distributors, suppliers, A&E's, and AHJ's) as merely transactional, but as one that includes a spiritual component. People do not live to work, but work to live, and we want our daily interactions to enrich the mind, the pocket...and the soul. That's why we invest in all our relationships. We want our people to feel happy (and stretched) in what they do, proud to be with a company that upholds their principles, and empowered to do their bit to contribute to society. We have always believed that if we do well by our employees, they too will do well by our customers and partners.

This comes at a cost of course, but it's very much worth it. For example, in 2008, as companies were laying off people during the financial crisis, we made a commitment to our employees that we would move heaven and earth before we let go of anyone doing their job properly. Jim and I took a cut, but no one else had to. By 2012, not only had we not laid off anyone, we had hired 50% more people! We reminded our colleagues in March, when the Covid-19 crisis started, that this commitment continues and that we wanted them to focus on three things: staying safe, keeping their families safe, and taking good care of our customers.

I also want to add that I personally have a particular debt of gratitude to all those who took a risk on us in the early days and helped us become successful. They cared. And they will always have a special place in my heart.

I hope the folks reading this find it useful. And I welcome the opportunity to hear their reflections about the industry we share and care so much about. I can be reached at [ctagher@stifirestop.com](mailto:ctagher@stifirestop.com).

## SCIENCE AND TESTING INFORM THE ENGINEERING JUDGMENT 4 QUESTIONS WITH ANGIE OGINO



Engineering judgments (EJ) help bridge the gap when it comes to a building's non-fire-rated exterior curtain wall intersecting with a fire-rated floor assembly. This perimeter fire containment (PFC) joint in the building code presents a concern for professionals in the life safety community. We caught up with Angela Ogino, Technical Services Leader for Owens Corning® Thermafiber® to discuss how EJs can support PFC assembly

decisions, what factors EJs should address, and resources to support life safety professionals responsible for specifying and installing assemblies.

### 1. In a vigorous design and code environment, what role do EJs play?

The nature of commercial architecture is to integrate creativity into the building design. However, such innovation may pose a challenge when it comes to finding a tested, third-party PFC assembly matching every detail of the curtain wall construction; for example, the hourly fire-resistance of the rated floor intersecting with the non-rated curtain wall and ancillary components.

But the confusion surrounding codes specific to perimeter areas is a critical concern. Neglecting to consider how variances in design might affect an assembly's performance could create a tragic outcome in the event of a fire. That's where EJs can support a decision. In situations where there are minor variances between an assembly and a tested system, the comprehensive evaluations and customized solutions in an EJ can support specifiers of passive life safety systems.

Over the past half-century, Thermafiber® has compiled a vast library of tested perimeter fire containment conditions. This test data is a great resource to help architects evaluate PFC assemblies. If a listed assembly doesn't exist to meet the needs of an architect's design, Thermafiber® can draw on experience to propose a system that meets testing criteria. Even with so many assemblies, we occasionally find situations where a tested assembly is missing. In those cases, Thermafiber/Owens Corning conducts third-party testing to assure the highest level of safety is accounted for in our PFC systems.

### 2. What do you do when a listed assembly does not exist to meet a building's design?

First, we make certain there is a tested and listed assembly that closely represents the project conditions. Then we address any differences between the tested system and the project design details. Finally, we base our project specific solution on internal test evaluations and best engineering principles.

Park Tower at Transbay in San Francisco is an example of our collaborative approach. The 43-floor building's design featured a back pan assembly installed on the inside surface of the spandrel façade. Back pans are not as prevalent in the Western U.S., but this feature was important to the façade's aesthetic design.

The Thermafiber Insolutions® team collaborated with the curtain wall manufacturer to evaluate options. We found only a few back pan assemblies listed and none met the construction details required for the facade.

Teams designed an alternative assembly, conducted a UL ASTM E 2307 full scale test and got it approved in time to meet the project deadline. The collaboration resulted in a new system (CW-D-1037).

### 3. What should every EJ include?

The International Firestop Council's (IFC) "Recommended IFC Guidelines for Evaluating Firestop Systems in Engineering Judgments" is an excellent resource. The Insolutions team has curated a library of assemblies spanning more than 50 years. As far as EJ best practices go, Thermafiber® Insulation specifies that an EJ must be project specific. At least one third-party tested system evaluated to ASTM E2307, must be referenced as the basis of design in order to properly evaluate the hourly F-rating. The EJ must include a full description of the system components, including the design criteria required for the system's operation. Additionally, the EJ must be based on interpolation of previously tested systems installed in similar conditions. It is important to note that an EJ is not a substitute for fire testing. Any new fire containment assembly should be tested for design and operation performance.

### 4. Beyond testing, what other best practices exist to help manage risk and liability with PFC systems?

In 2017, the U.S. Department of Homeland Security created the "Safety Act" designation. This designation provides protection against liability related to acts of terrorism, including parties involved in installing PFC assemblies, such as firestop contractors. Owens Corning is honored to be the first insulation manufacturer to receive this designation.

The SAFETY Act designation provides architects with protection against liability related to acts of terrorism.



Angela Ogino is the Technical Services Leader at Owens Corning® Thermafiber® Insulation. She can be reached at [Angela.Ogino@owenscorning.com](mailto:Angela.Ogino@owenscorning.com).

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# CONSTRUCTION SPECIALTIES

At Construction Specialties (CS), we are the industry experts when it comes to expansion joint covers (EJC). Each year we host our EJC Certified Installer Workshop where installers get the opportunity to learn firsthand from industry experts. This beneficial two-day, intensive, onsite session is hands-on. It allows installers to learn those valuable details they won't be able to get out of a manual. This will enable them to gain a whole new perspective on how the process is safely and correctly done. We go over troubleshooting tips and tricks that can reduce callbacks and labor times, lower job site risks, and much more.

The workshop takes place in Williamsport, Pa, just miles from where our expansion joint cover products are manufactured. Not only do the attendees get to learn from the industry leaders who pioneered new expansion joint cover technologies, but they also get a personal tour of our manufacturing facility.



*Photo Credit:  
Construction Specialties photo*

We typically have anywhere from 20-30 attendees each year. This allows us to keep an ideal staff-to-installer ratio so we can provide an instructional setting and give immediate individual feedback and attention. The expansion joint cover installations that we go over during these sessions are what installers will most likely run into on their job sites. If an installer has a request to learn about a specific model, we will do our best to accommodate them at the workshop as long as we are notified in advance.

Most expansion joint cover models are designed for a one-time, permanent installation and cannot be uninstalled without possible damage to various system components or building substrates. It's important to make sure the installation is done correctly the first time. If not, it could result in a loss of revenue and time due to repurchasing the product and reinstalling it. By attending our workshop, installers get the convenience of learning and practicing before they go out into the field.

All workshop graduates receive CS-preferred installer certification and can earn their registration fees back upon booking a \$10,000+ job - a short-term investment for a lifetime of knowledge. After the event is over, we encourage our attendees to contact us for questions or assistance with issues they may run into in the field. We want to be viewed as a resource of knowledge they can utilize at their disposal.

To register for our installer workshop, visit [installer.csgroup.com](http://installer.csgroup.com)

## ROCKWOOL

### Superior Protection and Performance in a Curtain Wall System

- ✓ Fire Resistant
- ✓ Long-Term Stable R-Value
- ✓ Sound Absorbent
- ✓ Water Repellent
- ✓ Environmentally Sustainable

**ROCKWOOL™ ROXUL SAFE™** is a lightweight, semi-rigid stone wool insulation board designed for fire-stopping and acoustical properties. It is designed to fill perimeter gaps between concrete floor slabs and exterior wall systems, between firewalls and ceiling slabs, and around conduit pipes and duct openings through walls and floor slabs. It is non-combustible and fire resistant, and will not develop toxic smoke or promote flame spread, even when exposed directly to a fire. When ROXUL SAFE™ is used with CURTAINROCK® 40/80, it provides a comprehensive fire-stopping system that has been UL/ULC/Intertek tested and approved for perimeter fire containment systems. ROXUL SAFE™ is always used in conjunction with a fire sealant to prevent passage of fire and smoke from one floor to the next.

**ROCKWOOL™ CURTAINROCK®** is a lightweight, semi-rigid stone wool insulation board designed for curtain wall systems. ROCKWOOL offers CURTAINROCK®, CURTAINROCK® 40, and CURTAINROCK® 80 to meet a wide variety of curtain wall specifications.



*Components: Concrete Floor Slab, ROXUL SAFE™, Fire sealant, Mullion cover - CURTAINROCK®, Transom, Stiffeners, Spandrel panel. ROCKWOOL IMAGE*

# MANUFACTURER SPOTLIGHT

## INPRO CORPORATION

Fireline® Fire Barriers are the only products of their kind that took on the challenge to improve fire barriers and succeeded. When it comes to protecting your building and the people inside, we make it as easy as possible with patented technologies that allow for consistent and efficient installation.



- A. Our Fireline® 140 features patented pre-attached flanges that utilize adjustable compression springs for consistent outward pressure within the joint.
- B. Similar to our Fireline® 520 system, sections of the 140 come with factory made male to female ends, eliminating the need for complex field manipulation at the seams. The days of layering fire blanket in the field are OVER! Not to mention, the 140 system does not require mechanical fastening or fire caulks for installation - no complicated tools or messy adhesives required. Insert Install Order Image Photo credit: Inpro Image
- C. However, the simple installation of the Fireline® 140 system certainly does not take away from its protective qualities. Within the tough outer walls of the 140 that are used for transportation and installation protection, there are layers of intumescents and high temperature insulation to resist toxic smoke and fire.
- D. The 140 system mounts against the inside face of the expansion joint. This not only eases installation of the 140 system, but also of any coverplate or chase wall system installed above. This allows for a more consistent finish throughout your design and more flexibility in your coverplate selection.

Want to reach those companies of importance to your business?

### Advertise in Life Safety Digest

and reach the roughly 15,000 • Building Code Officials • Firemarshals • Specifiers • Building Owners & Managers • Specialty Contractors and • Generals Contractors who read our magazine 4 times a year! Not to mention our presence at Industry Trade Shows and online in perpetuity at [fcia.org](http://fcia.org)

You find Life Safety Digest interesting and informative - so do these other 15,000 readers - shouldn't they be reading a bit more about your company as well?

Contact Cathy at [cathy@fcia.org](mailto:cathy@fcia.org) to discuss opportunities to grow your business through advertising

**Life Safety**  
DIGEST

# CODES AND STANDARDS NEWS

## UL STANDARDS TECHNICAL PANELS

UL's Standards Development Process follows a standard ANSI consensus process. UL has Standards Technical Panels (STP's) for UL 1479, UL 2079, and other UL Standards. Currently, the UL 1479/2079 are going through their 5-year review process,

with changes submitted and voted on by STP Members. FCIA's Standards Committee participates in this activity. Watch for more as the process continues.

## ASTM STANDARDS

The ASTM Standards Development Process is also a consensus process where industry experts and others come together to update standards. FCIA's Standards Committee leaders Jay McGuire, Tyler Ferguson, Tracy Smith, and Eric Keeton participate in this process,

along with FCIA's Executive Director, Bill McHugh. We are working on a new ASTM Labeling Standard for firestopping, the ASTM E2174/2393 Inspection Standards, Inspector Standard, the ASTM Firestopping Guide, Exposure, Movement, and much more.

## NEW CHICAGO BUILDING CODE COMING

There are very few cities left with their own building codes. Chicago prided itself on its Chicago Municipal Building Code – dating back to 1875, just after the Great Chicago Fire of 1871. In 1893, around the time when Chicago hosted a World's Fair, the code was updated. Then, 1949 was the last major update to the code. Memorandums were issued to keep the code up to date as buildings changed. A Task Group gathered by the City of Chicago

'Chicagoized' several of the ICC Family of Codes – Building, Energy, Administrative, Existing Buildings, Electrical – which will go into effect August 2020.

There are several 'Chicago-isms' inserted to the International Building Code from a fire-safety perspective, including 1-hour fire-resistance-rated corridors in schools, less reduction in fire-resistance, and more. Visit [www.ICCSafe.org](http://www.ICCSafe.org) to buy the new codes.

## ICC'S 2024 CODE DEVELOPMENT PROCESS

The International Code Council will start developing its 2024 Family of Codes NOW. The Code Action Committees (CAC's) have been working for a while and are developing concepts into code proposals over the next several months. The actual process

starts in January 2021 with code development submissions. Watch [www.CDPAccess.com](http://www.CDPAccess.com) for info. FCIA's Code Committee is already exchanging emails, talking about code proposals for the next cycle.

## NFPA'S 2024 CODE DEVELOPMENT

The NFPA starts its code development cycle for NFPA 101, The Life Safety Code, and NFPA 5000, Building Construction Safety Code, in June 2021 with code development proposals due. The

final meeting for development of the 2021 codes will not take place since the Expo and Annual Meeting were cancelled. Look for a virtual meeting in its place.



# Confidence in every installation

## UL Qualified SFRM Contractor Program

Fire-resistant designs featuring Spray-resistive Fire Resistive Material (SFRM) products remain important to the built environment. These designs serve as critical safeguards, insulating steel elements from fire damage and enabling the safer operation of floor, ceiling and wall assemblies, beams and columns.

The UL Qualified SFRM Contractor Program allows contractors to show their commitment to the proper installation of fireproofing materials. These contractors have implemented a stringent quality management system that includes a review of project design and construction document requirements; installation, training, application and field quality; documentation and record keeping.

**Learn more today at [UL.com/firebarriers](https://www.ul.com/firebarriers) or email [fire.inspection@UL.com](mailto:fire.inspection@ul.com).**

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# INDUSTRY NEWS

## FCIA'S EDUCATION AND COMMITTEE ACTION CONFERENCE

**FCIA's Virtual Education & Committee Action Conference** In addition to the big new initiative announcement, FCIA Members and non-members experienced a great program, great content, and a great way to catch up virtually - while hearing from industry-leading FCIA Manufacturer Member Partners:

**Leadership - FCIA's 2020 President Ben Urcavich** opened the program with a report that FCIA is financially sound through the novel coronavirus COVID-19. His comments also looked to the future and the question of where FCIA Members will find opportunities after the pandemic.

**Economics** - Anirban Basu (Sage Policy Group), economic consultant to various construction associations, gave insight into what to possibly expect for the 3rd and 4th quarters of 2020. He also highlighted building types that will likely get funding from various sources, key building types for FCIA Members to focus on for business during and after the pandemic. These building types included hospitals, airports, universities, and more. FCIA Members should plan now, so that when funding is released, they can capitalize on the opportunity to help protect people in these buildings through Firestopping and Barrier Management Services.

**Air and Smoke Movement** - Chris Kusel of HILTI, an FCIA Platinum Manufacturer Partner, presented about air and smoke movement in buildings, specifically highlighting how L-Rated Firestop Systems help keep buildings safe.

**Fire-Resistance and Existing Buildings** - FCIA's Bill McHugh and Rich Walke, Consultant to FCIA, presented on the opportunity to provide safety in existing buildings. Health care occupancies, specifically hospitals, seem to be where the most attention is given for effective compartmentation. But, what about other

occupancies, like high-rise buildings, multi-family buildings, nursing homes, hotels, educational facilities, universities, and more? People live, work, and stay in these facilities, making fire and life safety an integral need. The FCIA Member knowledge is best to maintain the effective compartmentation at its original level of fire- and smoke-resistance.

**Expansion Joints** - Platinum Manufacturer Partner CSW-Balco/Rectorseal's Steve Cooper presented on expansion joints, both fire-resistance-rated and non-rated, providing education on an additional business opportunity for FCIA Members to pursue.

**Barrier Management Symposium: Test Standards** - FCIA's Rich Walke presented the standards portion of FCIA/ASHE/TJC/UL's Barrier Management Symposium. He covered the many fire-test standards used for all the features of fire-resistance. An FCIA Member who is knowledgeable on all the fire-resistance details, in addition to firestopping knowledge, adds to the company's value proposition.

**Endothermic Technology** - Samantha Peterson of 3M, FCIA Platinum Manufacturer Partner, presented a program on endothermic wraps being used to optimize protection of critical electrical and communications circuits and structural steel. Her presentation brought the technology and educated members on this subject.

**Barrier Management Symposium: Codes** - FCIA Code Consultant Bill Koffel presented the code portion of FCIA/ASHE/TJC/UL's Barrier Management Symposium, defining fire and smoke barriers, fire walls, fire partitions, and smoke partitions, how they are defined, and what they do to protect people in buildings. FCIA Members get how to protect these barriers in all types of facilities.

**Firestopping Health Care Facilities** - FCIA Platinum Manufacturer Partner Specified Technologies, Inc.'s Kelly Mason and Consultant Doug Erickson covered the importance of firestopping in hospital facilities and how barrier management fits into a hospital's safety plan. Doug's experience with the Facility Guideline Institute provided insight into how FCIA Members can serve these facilities.

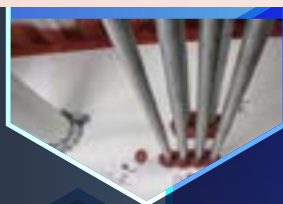
**New Initiative** - FCIA's 2020 President then requested that those on the virtual conference be ambassadors for firestopping, fire-resistance in existing buildings, and FCIA. He encouraged everyone to speak about the importance of ALL pieces of fire-resistance to everyone you know. Together, we can make a difference. Together, we can change the current

culture that lets fire-resistance-rated assemblies become breached everywhere to a culture focused on having the Specialty Firestop Installation Contractor and Barrier Management Services Contractor fix these barriers. Sprinklers and alarms are maintained and repaired. Firestopping and fire/smoke or other barriers need to be maintained and repaired too.

FCIA Members, the recordings are in the Members Only section at [www.FCIA.org](http://www.FCIA.org). Not a member? Join now. Do you know someone who should be a member? Email [info@fcia.org](mailto:info@fcia.org) and we'll help you now.



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## FCIA COMMITTEES MEET

With the FCIA ECA Conference that was to take place in May cancelled, FCIA's leadership decided to hold Virtual Committee Meetings. Using videoconferencing, 12 FCIA Committee Meetings were scheduled with participation from Committee

members and guests. Great things happen when FCIA Committee members put their heads together for the advancement of the firestopping and effective compartmentation industry.

## WEBINARS, WEBINARS, WEBINARS

FCIA's Webinars have been very well attended with many great speakers, topics, and CEU credits provided since March. FCIA's Webinars will continue to provide opportunities for great technical content. We applaud

FCIA's Manufacturer, distributor and other partners for scheduling and conducting webinars. Many have been very well received and are a great education resource.

## EMAIL SCAMMERS STRIKE AGAIN

FCIA's office has received notice from members that email addresses are getting stolen or spoofed, then used to scam people for money, and other stuff. Luckily, FCIA Members are smart enough to check who really sent the email, alert us, and contact their friends

to be sure the emails are fake. Email spammers show more and more finesse in their scam, often disguising themselves as people you know. Don't let them get you. Be sure emails are legitimate before responding or opening attachments.

## FCIA WEBINAR ARCHIVES

Want to educate your staff and others? Want to review a past webinar? FCIA publicly posts the presentation PDF's to the FCIA Webinar Archives Page. FCIA Members get the benefit of listening to

the recording of the presentations. We've had a lot of webinars recently. Use the archived programs for key firestopping and effective compartmentation education. Not a member? Join FCIA.

## FCIA'S BARRIER MANAGEMENT SERVICES PAGES

[FCIA.org](https://www.fcia.org)'s new Barrier Management Services section is where Firestop and Barrier Management Specialists are found. Check out the experts listed there. They know and respect the listings needed

to get firestopping and effective compartmentation components surveyed, repaired, and operating as they were intended to be.

## CANCELLATIONS

We are amazed at the amount of cancellations that have taken place for various events throughout the world. One thing is certain, the COVID-19 novel coronavirus has changed a lot of things worldwide. While many industry events were cancelled or transitioned to virtual platforms, including the NFPA Conference & Expo, the NASFM Annual

Conference, the ICC Conference & Expo, Construction Specifications Canada Conference, AIA Conference on Architecture, IFMA Facility Fusion, BOMA International Annual Conference & Expo, and more, FCIA's Firestop Industry Conference & Trade Show is still scheduled to open as planned this November.

## NEW NORMAL

Contractors, Inspection Agencies, Manufacturers, Distributors, Code Officials, Building Owners and Managers, Facility Directors, and Fire Marshals have all had to alter the way they do business during this pandemic. Remote working, webcam meetings using many types of software, social distancing, and personal

hygiene rules have all changed. Many organizations were ready for this and are doing ok, albeit differently and with much more effort to coordinate the workforce and materials. FCIA Member Contractors are adjusting and report that they are still busy.

## ICC & BUILDING SAFETY MONTH

While May usually brings many face-to-face events for the International Code Council's Building Safety Month, ICC is holding webinars in the face of the pandemic. Week 1 was Disaster Preparedness; Week 2, Water Safety; Week 3, Resilience and Sustainability;

and Week 4, Training the Next Generation. These are timely topics at any time, but even more so now that we're in a pandemic. Visit [www.iccsafe.org/advocacy/building-safety-month/2020-building-safety-month/](http://www.iccsafe.org/advocacy/building-safety-month/2020-building-safety-month/) for archived material on Building Safety month.

## VIRTUAL INSPECTIONS

The International Code Council published a detailed article on remote inspections from the Building/Code Official and Contractor perspectives. It's got detailed

info on what is needed. Check it out at [www.iccsafe.org/building-safety-journal/bsj-technical/considerations-for-virtual-and-remote-inspections/](http://www.iccsafe.org/building-safety-journal/bsj-technical/considerations-for-virtual-and-remote-inspections/).

## NFPA PROVIDES CORONAVIRUS RESOURCES

NFPA offers a variety of resources that emergency managers, businesses, schools, health care providers, and others can use to help prepare for, develop, or update continuity plans and protect those who may

be vulnerable or exposed to this infectious disease. Check it out at [www.nfpa.org/Codes-and-Standards/Resources/Standards-in-action/NFPA-responds-to-the-coronavirus](http://www.nfpa.org/Codes-and-Standards/Resources/Standards-in-action/NFPA-responds-to-the-coronavirus).

## CORONAVIRUS RESOURCES

In all the posting we've seen over the past 8 weeks, the most cited sources are the US Center for Disease Control - [www.cdc.gov/](http://www.cdc.gov/) - Canada's Public Health Services Website - [www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/latest-travel-health-advice.html](http://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/latest-travel-health-advice.html) - and the USA OSHA's Guidance for Preparing Workplaces for COVID-19 - [www.osh.gov/Publications/OSHA3990.pdf](http://www.osh.gov/Publications/OSHA3990.pdf), plus the World Health Organization's Coronavirus site - [www.who.int/emergencies/diseases/novel-coronavirus-2019](http://www.who.int/emergencies/diseases/novel-coronavirus-2019). Our friends in the Middle Eastern Countries all have great website resources as well. Use them as this novel coronavirus shelter in place starts to end.

## NEW ROCKWOOL PLANT

The construction of Rockwool's second USA factory in Ranson, WV is well underway. Starting early 2021, this 460,000 square foot facility will help ROCKWOOL grow its share in the United States marketplace and continue to serve demand. Strategically located to service the growing Eastern and Central USA markets,

the Jefferson County production facility will add to the ROCKWOOL Group's already strong presence in North America. The company has existing manufacturing sites in Marshall County, Mississippi as well as Milton, Ontario and Grand Forks, British Columbia.

## AMERICAN PERMALIGHT MOVES TO NEW HOME

American Permalight®, Inc. first opened its doors in March of 1988. Since then, the photoluminescent safety product manufacturer has continued to grow. This May, the company announced that they have moved

their headquarters into a new, larger space at 2570 W. 237th Street, Suite C, Torrance, CA 90505. All other contact information remains the same. To learn more, visit [www.americanpermalight.com](http://www.americanpermalight.com).

# FCIA INDUSTRY CALENDAR

## JUNE

### June 3-7-CANCELLED

RAIC 2020 Conference on Architecture  
Edmonton, AB  
[www.raic.org](http://www.raic.org)

### June 15-18-CANCELLED

NFPA Conference & Expo  
Orlando, FL  
[www.NFPA.org](http://www.NFPA.org)

## JULY

### July 7-9

BOMA International Conference & Expo  
VIRTUAL Conference  
[www.BOMA.org](http://www.BOMA.org)

### July 27-29-CANCELLED

NASFM Annual Conference -  
Stowe, VT  
[www.firemarshals.org](http://www.firemarshals.org)

## AUGUST

### August 1-3

APPA Annual Conference and  
Exhibition  
Boston, MA  
[www.appa.org](http://www.appa.org)

## SEPTEMBER

### September 20-22-CANCELLED

Canadian Healthcare Engineering  
Society (CHES) Annual Conference  
Halifax, NS  
[www.ches.org](http://www.ches.org)

### September 23-25-CANCELLED

FCIA 'DIIM' Symposium Canada  
Halifax, NS  
[www.fcia.org](http://www.fcia.org)

### September 30-October 2

CSI CONSTRUCT Expo  
Grapevine, TX  
[www.constructshow.com](http://www.constructshow.com)

### September 30-October 2

International Facility Managers  
Association (IFMA) World Workplace  
Chicago, IL  
[www.worldworkplace.ifma.org](http://www.worldworkplace.ifma.org)

## OCTOBER

### October 4-7

ASHE Annual Conference and Technical  
Exhibition  
Chicago, IL  
[www.ASHE.org](http://www.ASHE.org)

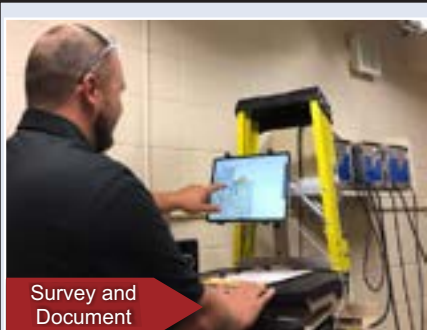
### October 11-12 - CANCELLED

ICC Annual Conference and Building  
Safety & Design Expo  
St. Louis, MO  
[www.ICCSAFE.org](http://www.ICCSAFE.org)

## NOVEMBER

### November 10-13

FCIA FIC '20 - Firestop Industry  
Conference & Trade Show  
San Diego, CA  
[www.fcia.org](http://www.fcia.org)



Survey and Document



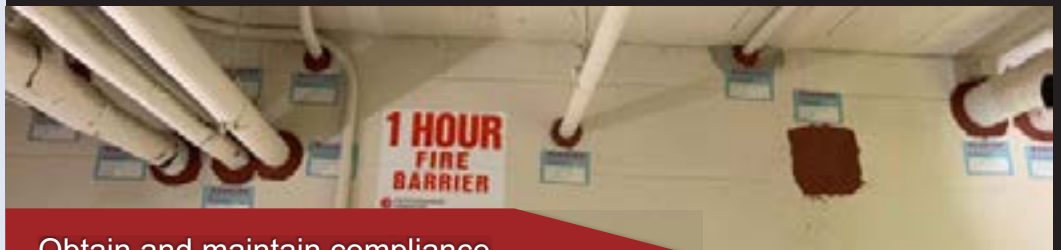
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