Specified Technologies Inc.

Barrier Management for Compliance in Healthcare Facilities

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Northwest Regional Healthcare Manager

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Technologies Inc.

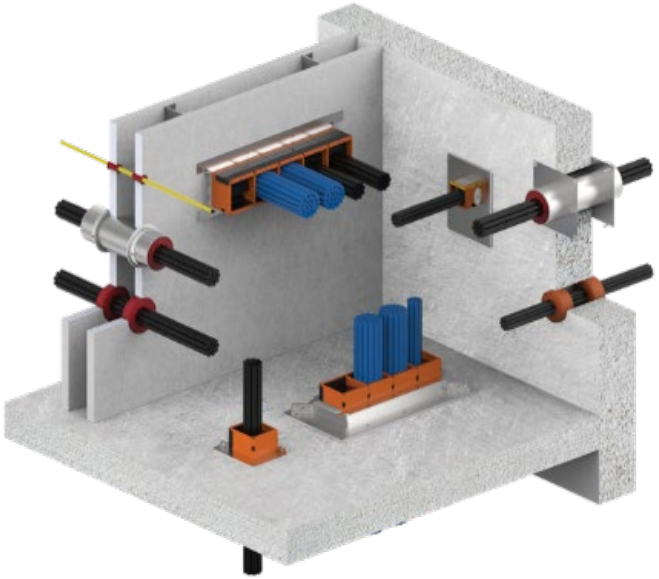
Learning Objectives

- Recognize the importance of a preconstruction risk assessment and the IBC special inspection for firestopping requirement prior to construction.
- Discuss the process used to ensure fire and smoke rated barrier compliance during safety inspection commissioning.
- Differentiate between common fire protection and life safety code sections in the IBC (Division 7) and NFPA 101.
- Discuss procedures that can be implemented to assist with fire and smoke barrier compliance during the preconstruction stage.

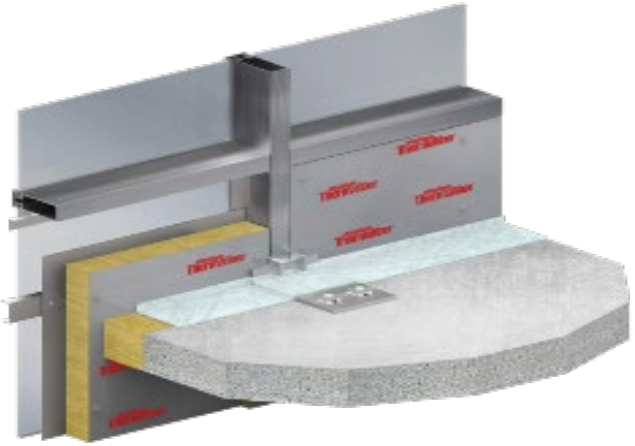
AIA Continuing Education

ICC INTERNATIONAL CODE COUNCIL®

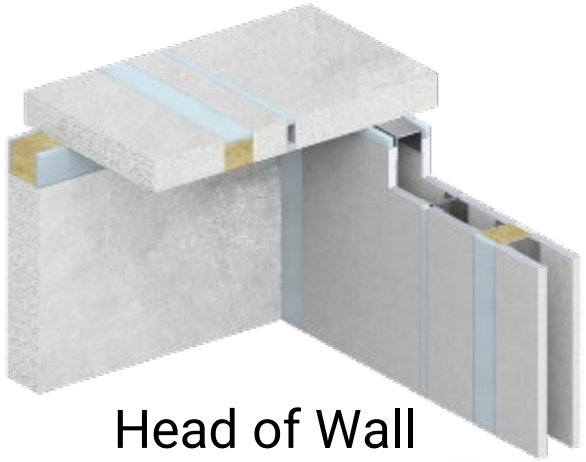
Many types of applications



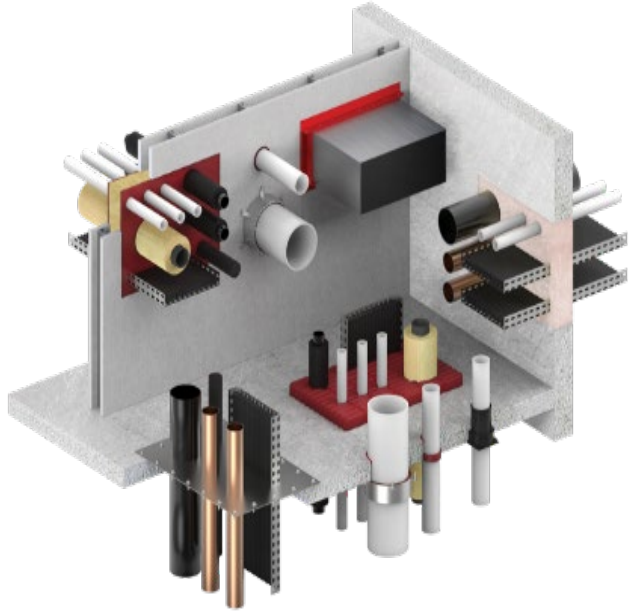
Cable Management



Curtain Wall

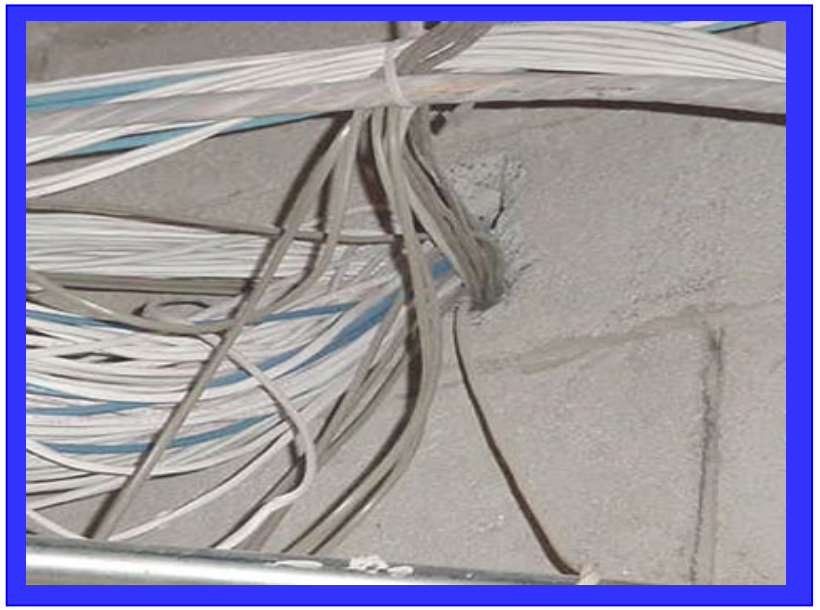


Head of Wall



Mechanical
Electrical
Plumbing

In the world above the ceiling tiles…



…out of sight can be out of mind!

There is NO tested system for this mess

Even in new construction

Even when we have made the effort

Openings that once were sealed may no longer be.

Giant red flag!

Drywall mud is NOT firestop!

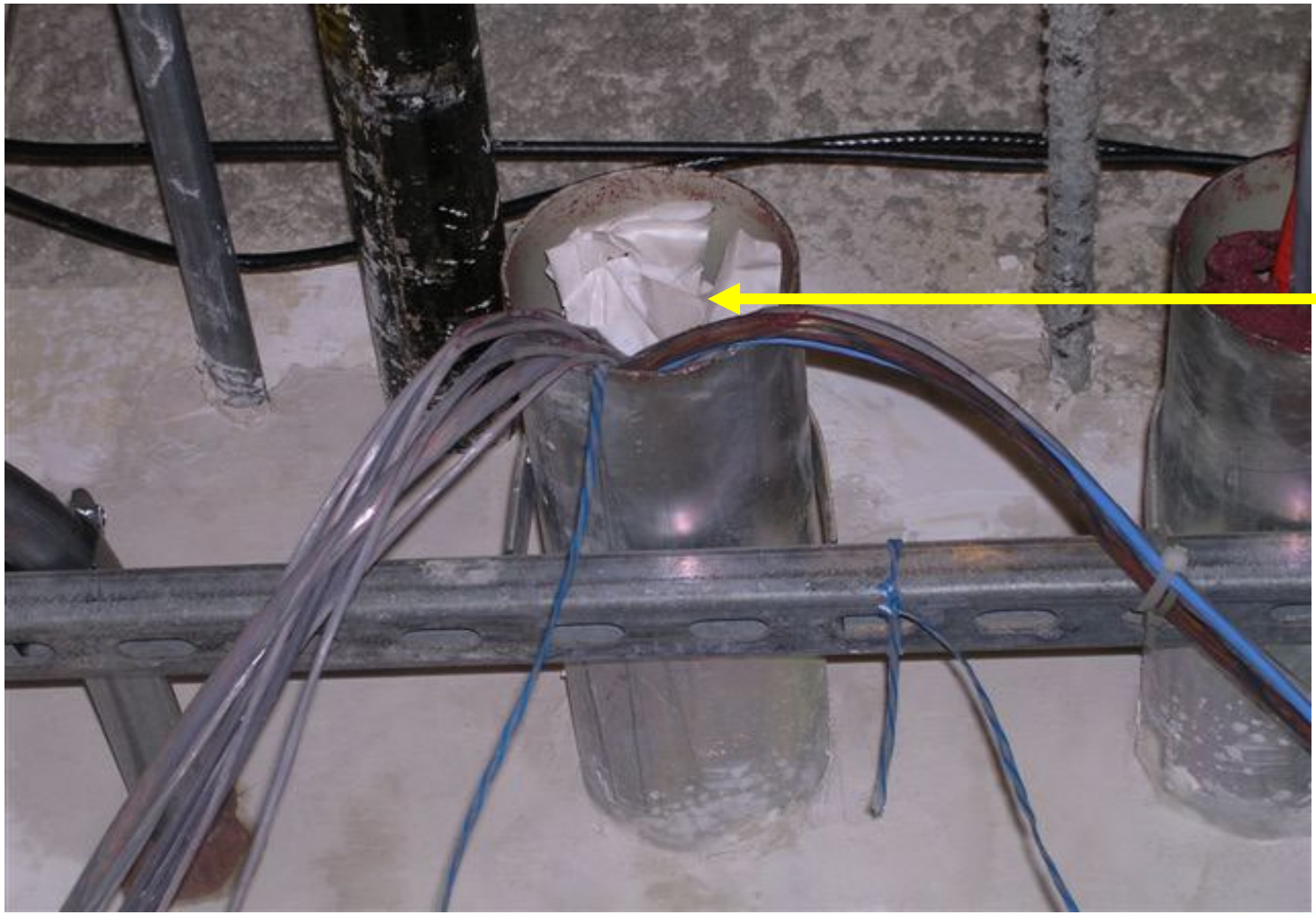
Are scab patches compliant?

A lot of time spent!

Compliance misinterpreted

Non-compliant

Paper as a firestop?



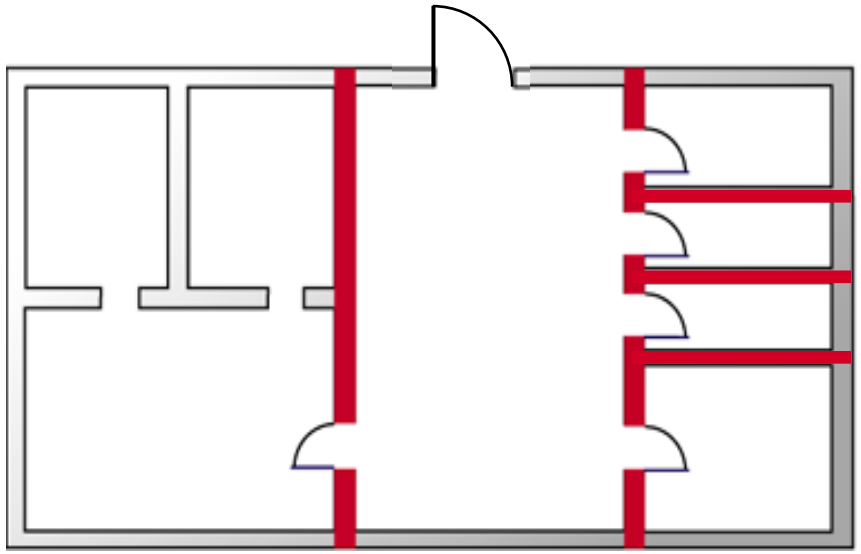
Make sure that any materials used are called out in the listed system.

Key Principles of Balanced Fire Protection

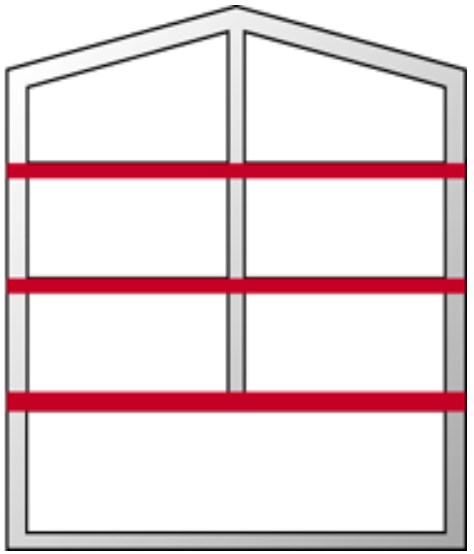
1. Early **Detection**
   - Smoke & Fire Alarms
   - Warning for Egress & Fighting Fire
2. Active **Suppression**
   - Extinguish Fire (Active)
   - Sprinkler Systems
   - Fire Fighting
3. Compartmentation or **Containment**
   - Contain fire to place of origin (Passive resistance)
   - Walls, floors, doors, windows, damper ducts, firestop, etc.

Compartmentation is Critical

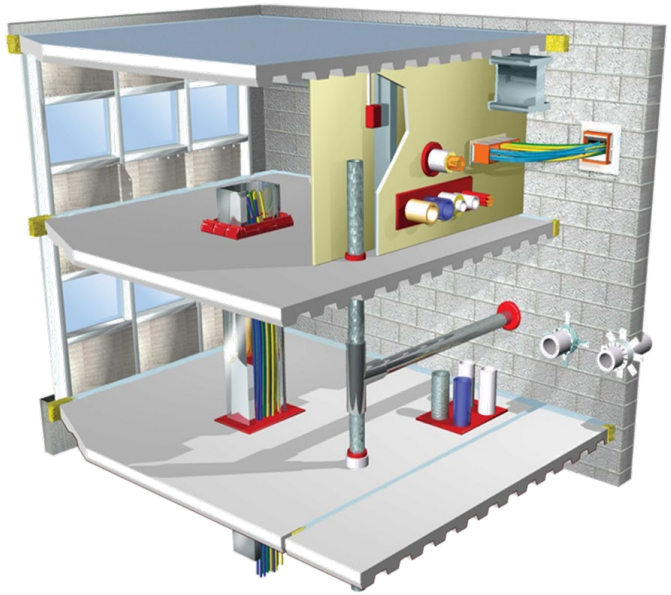
The spread of fire can be restricted by dividing a building into separate compartments with fire-resistive walls and floors—increasing the availability of escape routes for occupants.



Fire walls

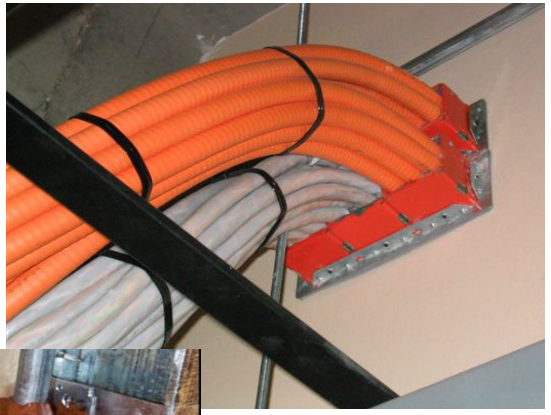


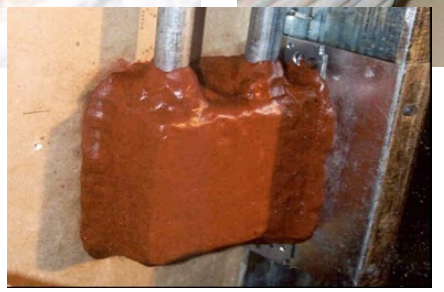
Fire floors



3 Main Types of Firestop Systems

1. Penetrations
    - Through-penetrations
    - High Traffic Openings (Cables)
    - Membrane penetrations
2. Construction joints
3. Perimeter fire containment systems

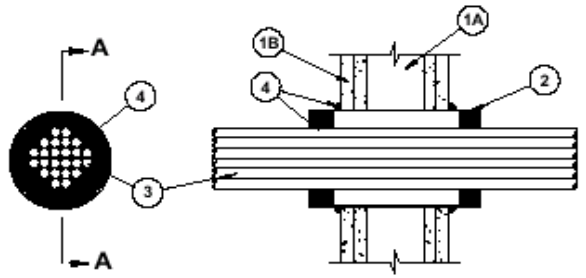




The third-party tested system MUST match the field conditions

1. Assembly Type & Rating
2. Hole Size/Annular Space
3. Penetrant Type
4. Firestop Material

More than just red caulk!!!



Section A-A

System No. W-L-3132
F Ratings — 1 and 2 Hr (See Item 1)
T Ratings — 0 Hr

UL systems are two things for an installer:

1) set of build-instructions

2) evidence of compliance

Series Designs in the UL Fire Resistance Directory. Max diam of opening is 4 in.

A. Max 200 pair No. 24 AWG (or smaller) copper conductor cable with polyvinyl chloride (PVC) jacketing and

E. Max RG59/U (or smaller) coaxial cable with fluorinated ethylene insulation and jacketing.
F. Max 62.5/48 fiber optic cable with PVC insulation and jacketing.
G. Max 4 pair No. 24 AWG (or smaller) copper conductor data cable with Hylar insulation and jacket.

4 **Fill, Void or Cavity Material*** — **Putty** — Min 1 in. thickness of fill material applied within annulus, flush with both ends of sleeve. A nom 1/4 in. diam continuous "rope" of putty shall be applied around the circumference of the steel sleeve at its egress from both sides of the wall.
Specified Technologies Inc. — SpecSeal Putty

5. **Fill, Void or Cavity Material*** — **Sealant** — As an option to the "rope" of putty, a min 1/4 in. diam bead of sealant may applied at the gypsum wallboard/steel sleeve interface on both sides of the wall.
Specified Technologies Inc. — SpecSeal Series 100 or Series LC Sealant

*Bearing the UL Classification Marking

Created or Revised: 01/01/00
Specified Technologies, Inc., Somerville, NJ (800) 992-1180
FOD-3256

Following a UL® System Approach

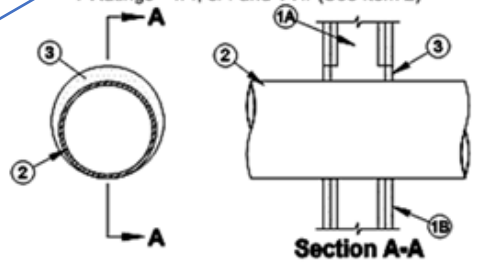
Every application has its own <u>system</u> which calls out:

- Hourly Fire Rating
- Type of Barrier
- Type of Penetrant
- Min/Max Annular Space*
- Firestop Materials

System No. W-L-1222

F Ratings - 1 and 2 Hr (See Item 1)

T Ratings - 1/4, 3/4 and 1 Hr (See Item 2)



1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.

   B. **Gypsum Board* -** Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Max diam of opening is 10-5/8 in. (270 mm).

   The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. **Through Penetrant -** One metallic pipe, conduit or tube to be installed eccentrically or concentrically within the firestop system. Pipe, conduit or tubing may be installed at an angle not greater than 45 degrees from perpendicular. The annular space between the pipe, conduit or tube and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). Pipe, conduit or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of metallic pipes, conduits and tubes may be used:

   A. **Steel Pipe -** Nom 8 in. (203 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.

   B. **Iron Pipe -** Nom 8 in. (203 mm) diam (or smaller) cast or ductile iron pipe.

   C. **Conduit -** Nom 6 in. (152 mm) diam (or smaller) rigid steel conduit, nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT) or nom 4 in. (102 mm) diam (or smaller) flexible steel conduit.

   D. **Copper Pipe -** Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.

   E. **Copper Tube -** Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tube.

Type of Penetrant	Max Diam	T Rating
Steel or iron pipe, steel conduit or EMT	2 in. (51 mm)	1 hr
Steel or iron pipe, steel conduit or EMT	8 in. (203 mm)	3/4 hr
Copper pipe or tube	4 in. (102 mm)	1/4 hr

2A. **Through Penetrating Product* - Flexible Metal Piping -** As an alternate to Item 2, one nom 1-1/4 in. (32 mm) diam (or smaller) steel flexible metal pipe to be installed either concentrically or eccentrically within the firestop system. The annular space between the pipe and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). Pipe to be rigidly supported on both sides of the wall assembly.

OMEGA FLEX INC

TITEFLEX CORP

A BUNDY CO

WARD MFG INC

3. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At point contact location, min 1/4 in. (6 mm) diam bead of fill material applied at metallic pipe/gypsum board interface on both surfaces of wall.

SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

*Bearing the UL Classification Mark

Recognized and accredited third-party test facilities (US)

Underwriters Laboratories Inc.

Intertek Total Quality Assurance

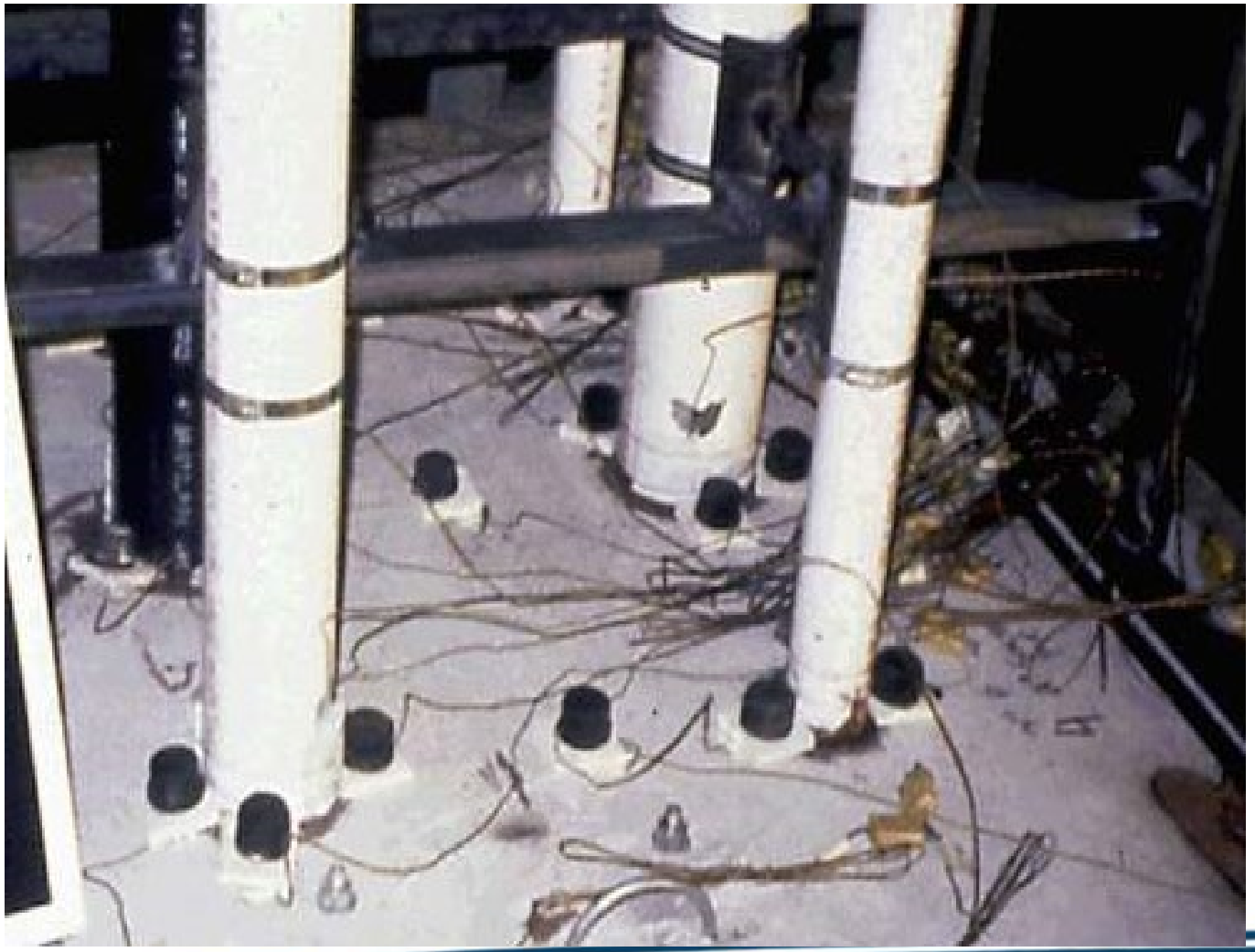
Factory Mutual Approvals

Tests conducted per code-required standards – ASTM and UL

All “nationally recognized test laboratories” are of equal status in regulations (code acceptance)

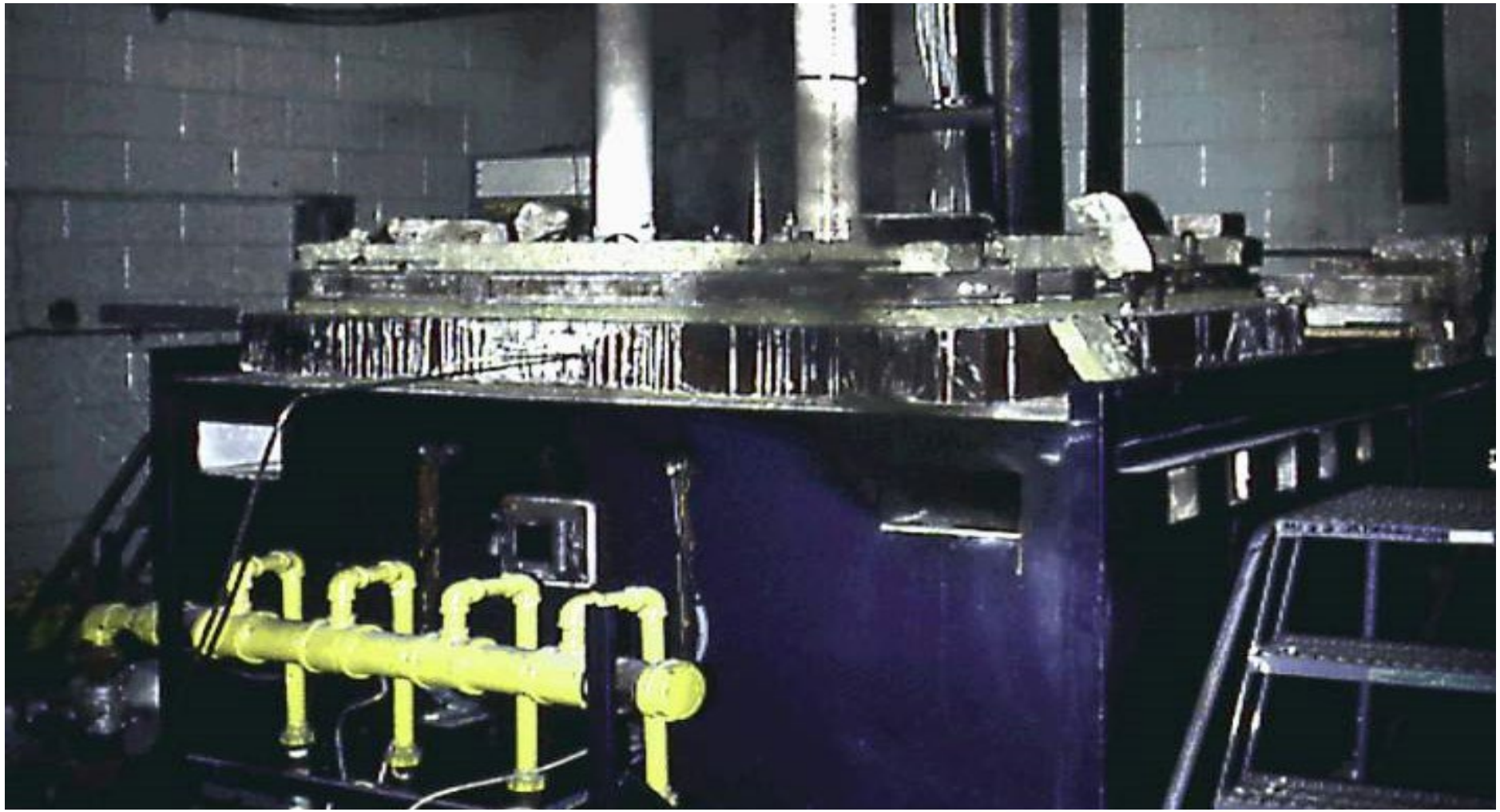
Each test lab publishes its own listing directory

Through-penetrations top view (before)

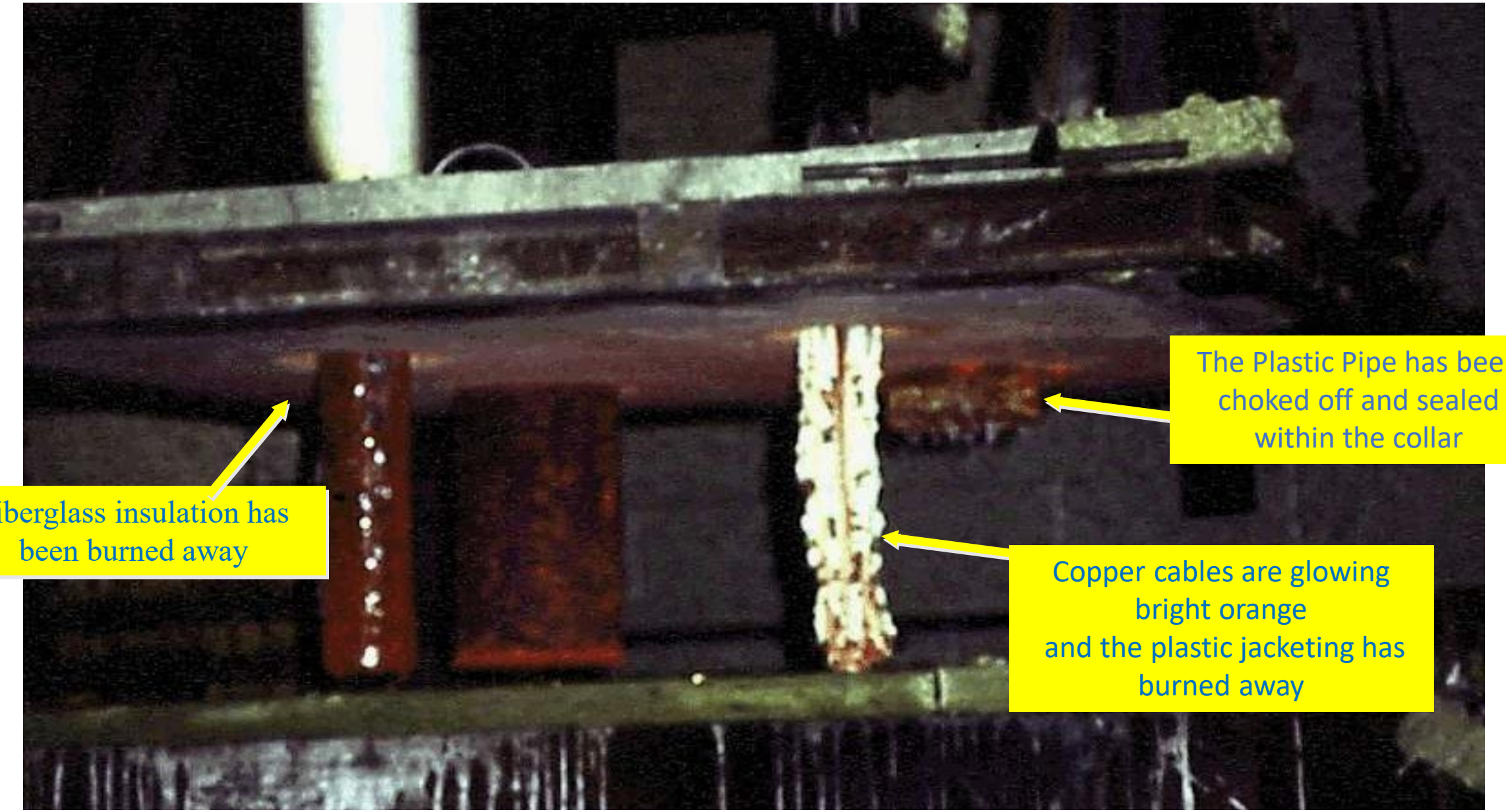


Through-penetrations bottom view (before)

Side view (during fire)



Slab bottom view (after)



The Hose-Stream Test

F Rating

The time period that the through-penetration firestop system limits the spread of fire through the penetration when tested in accordance with ASTM E 814 or UL1479.

What's a T Rating?

Temperature or Insulation Rating:

The time it takes for a single point on the non-fire side to reach 325ºF over the initial starting temperature

(e.g. 400 ºF where ambient temperature was 75ºF)

L Rating

714.4.4 Penetrations in **smoke barriers**.

Systems for penetrations in smoke barriers must be tested for air leakage per UL 1479.

L Rating shall not exceed:

1. 5 cfm/sf of opening for each firestop system
2. Total of 50 cfm for any 100 sf of wall or floor area

Source: 2015 IBC online

What's a W Rating?

Water-tight Rating (optional):

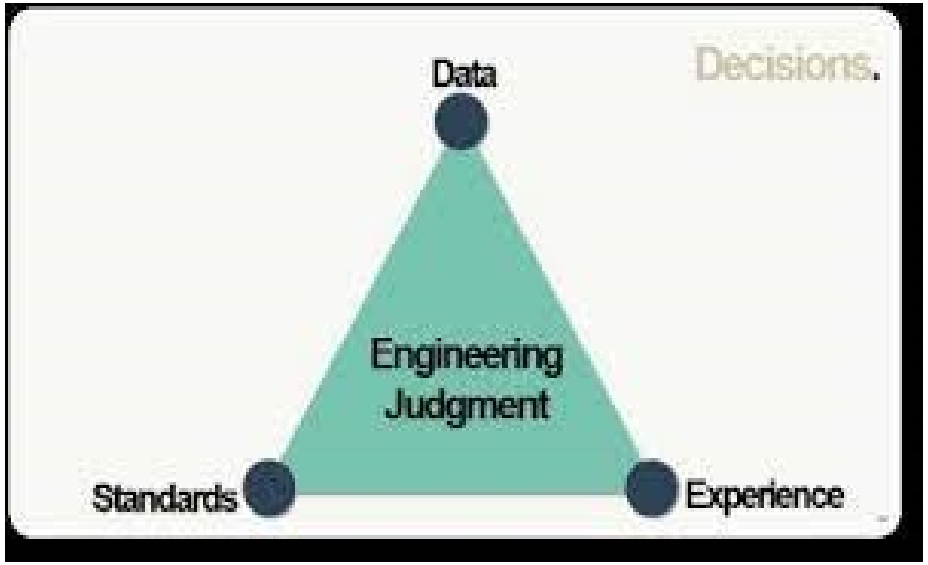
3 feet of head pressure is applied to the seal for 72 hours to determine if the seal is "water-tight"

NO

YES

Engineering Judgments

An Engineering Judgment (EJ) is a letter or report issued by some knowledgeable party which evaluates the construction of some site-specific application which deviates from a tested design, system or assembly and concludes with a judgment of the applicable rating of that assembly



Engineering Judgments

- EJs' are NOT tested systems
- EJs' are recommendations from the manufacturer for firestopping field conditions that deviate from tested designs
- EJs' should not be a substitute for upfront planning during preconstruction and coordination
- Prior to use, EJs' should be approved by the Architect, Engineer and the Authority Having Jurisdiction

Cost of maintaining barriers

- What is the true cost of sealing barriers that have been left non-compliant?

- What is the cost of generating work orders and implementing action to be taken for repair?

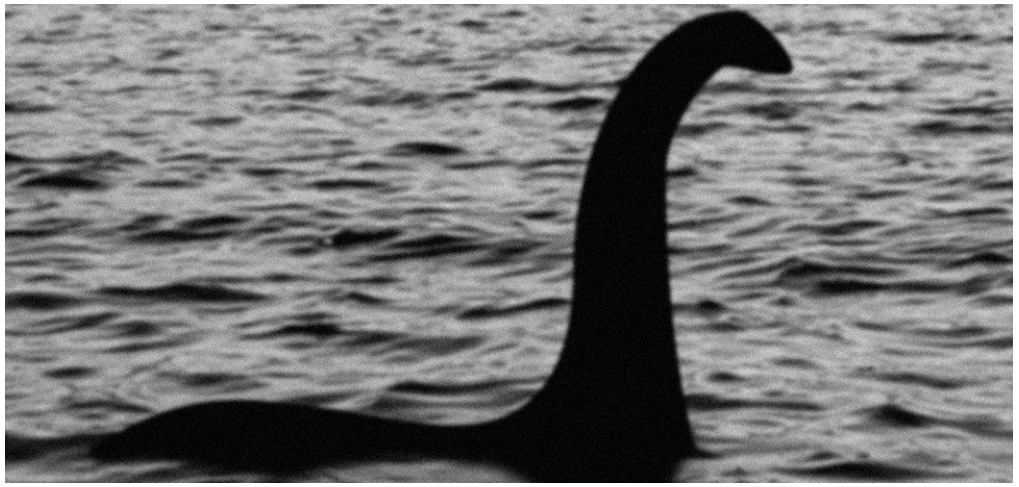
These things don't happen for free!

Cost of maintaining barriers

- What is the added cost to insure IC is being adhered to in vulnerable areas?
- What are the cost for empty beds due to remediation efforts?
- What cost are associated with performing a LSC risk assessment?
- What if it is determined that ILSM's will need to be implemented?

What's the big mystery?

- Misunderstanding of Products
- Misunderstanding of Applications
- Misunderstanding of Ratings
- No UL System Approach



These problems can be rectified with a solid technical training process as part of a **Barrier Management Program.**

Barrier management programs

Proper installations require understanding:

1. The Role of Barriers/Compartmentation
2. How Barriers Are Compromised
3. Following a UL System Approach
4. Understanding Basic Product Installation

Barrier management programs

- Managerial approach to firestop
- Support systems:
  - Specialized support
  - Technical support
  - Training
- Proper UL System selection & inspection
  - Utilize products engineered for the specific application
    - Re-enterable cable penetrations
    - Joint movement capabilities
    - Acoustics

Best Practices!

Why a barrier management program?

- Meet regulatory compliance
- Promote proper installations (per code)
- Stop annual outlay of capital
- Exhibit a proactive approach to inspectors
- Prevent property loss
- Life safety
- SOP

What does a (SOP) Standard Operating Procedure look like?

- A full overview of Policies and Procedures
- A part of the bid documents
- PCRA
- Permitting of personnel and work
- Submittal requirements
- Installation requirements
- Architectural specifications

Failure to meet the SOC will result in contract termination!

Get It Right The First Time - PCRA

- Typically, not performed
- Minimize schedule delays
- Minimize cost overruns
- No surprises at inspection time
- Ensure construction elements are correct
- Ensure the correct assemblies have been selected
- Everyone on the same page
- A Specialty Firestop Contractor can be an important part of this process

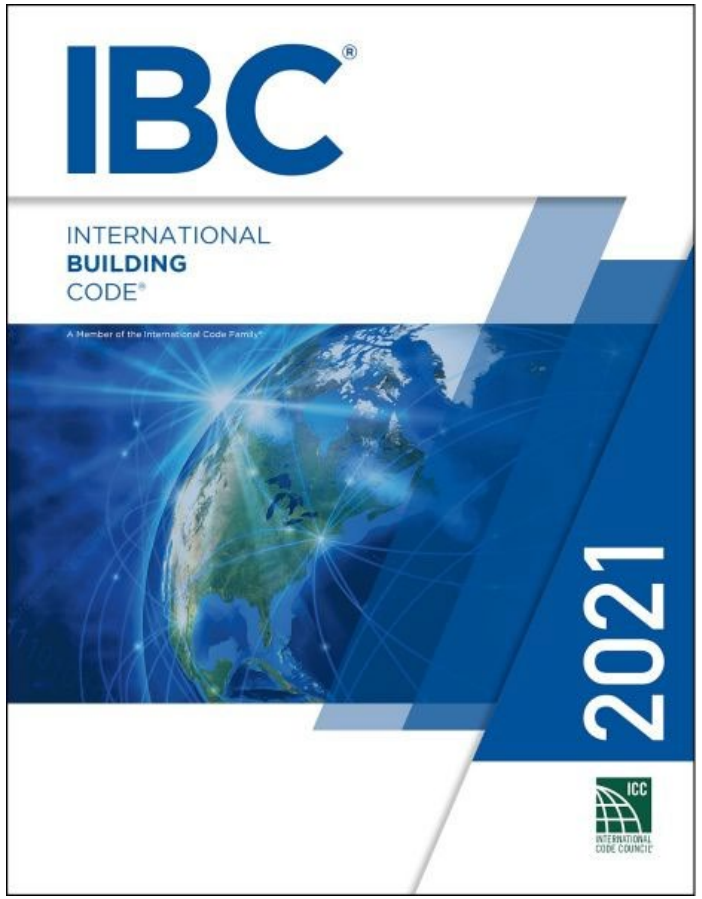
What to consider in the design

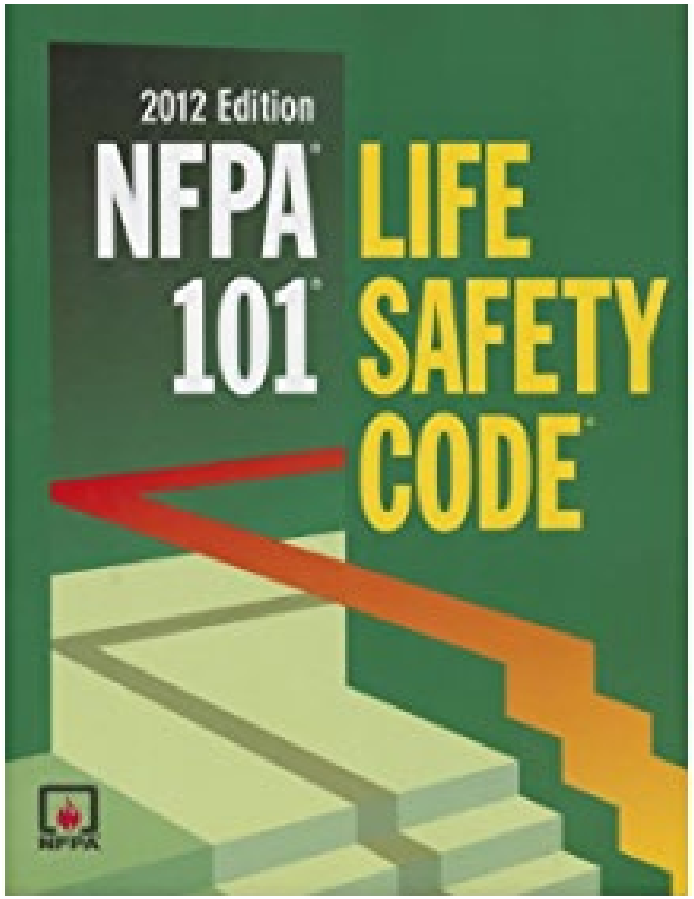
Specifications

- Division 7 General Firestopping
  - Joint Systems
  - Perimeter Firestopping
  - Through Penetration
- Division 22 Firestopping for Plumbing
- Division 23 Firestopping for Heating Ventilation and Air Conditioning
- Division 26 Firestopping for Electrical Systems
- Division 27 Firestopping for Telecommunications and Data Cabling

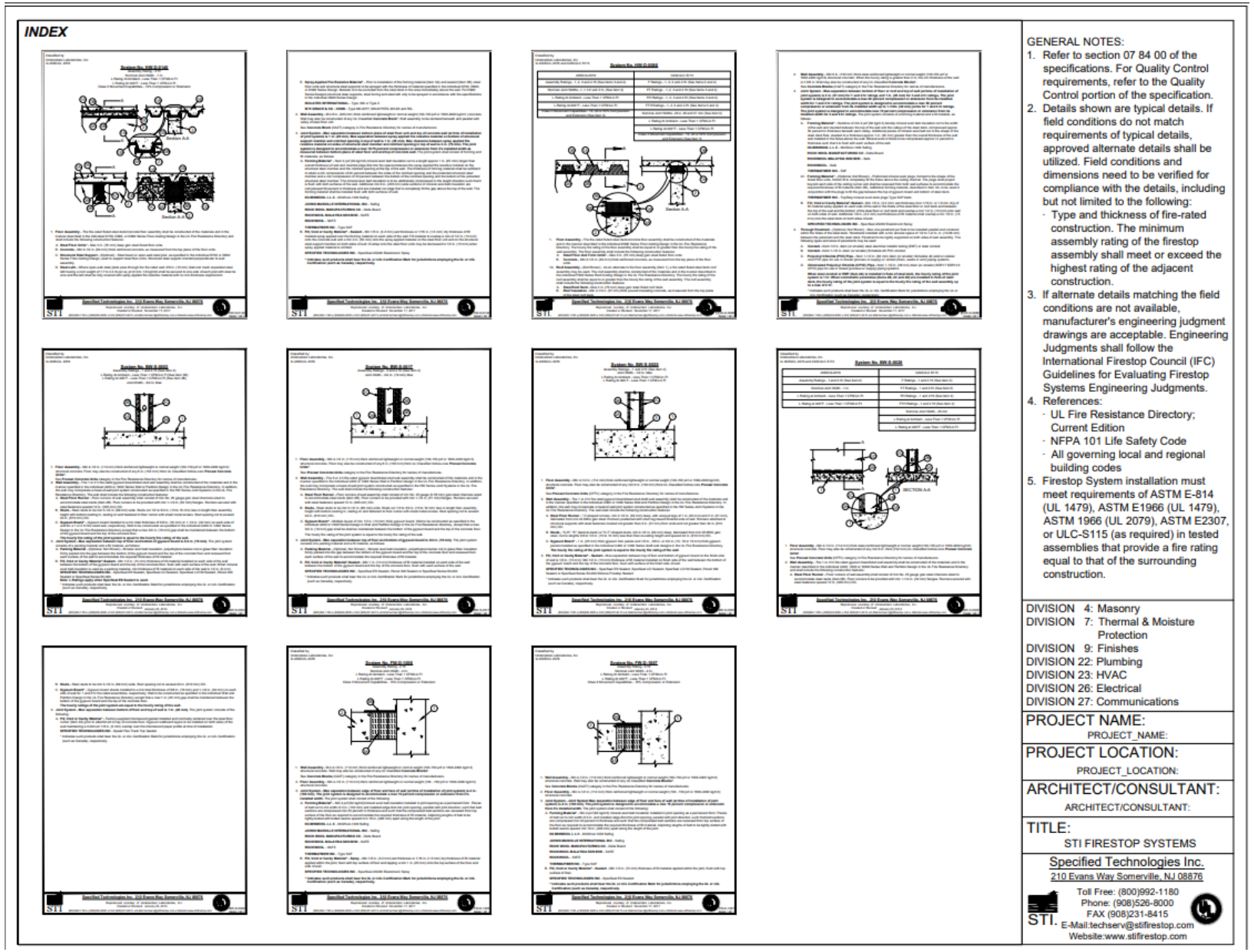
What to consider in the design

Know your code





System details on the drawings



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GENERAL NOTES:

1. Refer to section 07 84 00 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
   - Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Engineering Judgments shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
4. References:
   - UL Fire Resistance Directory; Current Edition
   - NFPA 101 Life Safety Code
   - All governing local and regional building codes
5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479), ASTM E1966 (UL 1479), ASTM 1966 (UL 2079), ASTM E2307, or ULC-S115 (as required) in tested assemblies that provide a fire rating equal to that of the surrounding construction.

DIVISION 4: Masonry
DIVISION 7: Thermal & Moisture Protection
DIVISION 9: Finishes
DIVISION 22: Plumbing
DIVISION 23: HVAC
DIVISION 26: Electrical
DIVISION 27: Communications

PROJECT NAME:
PROJECT_NAME:

PROJECT LOCATION:
PROJECT_LOCATION:

ARCHITECT/CONSULTANT:
ARCHITECT/CONSULTANT:

TITLE:
STI FIRESTOP SYSTEMS

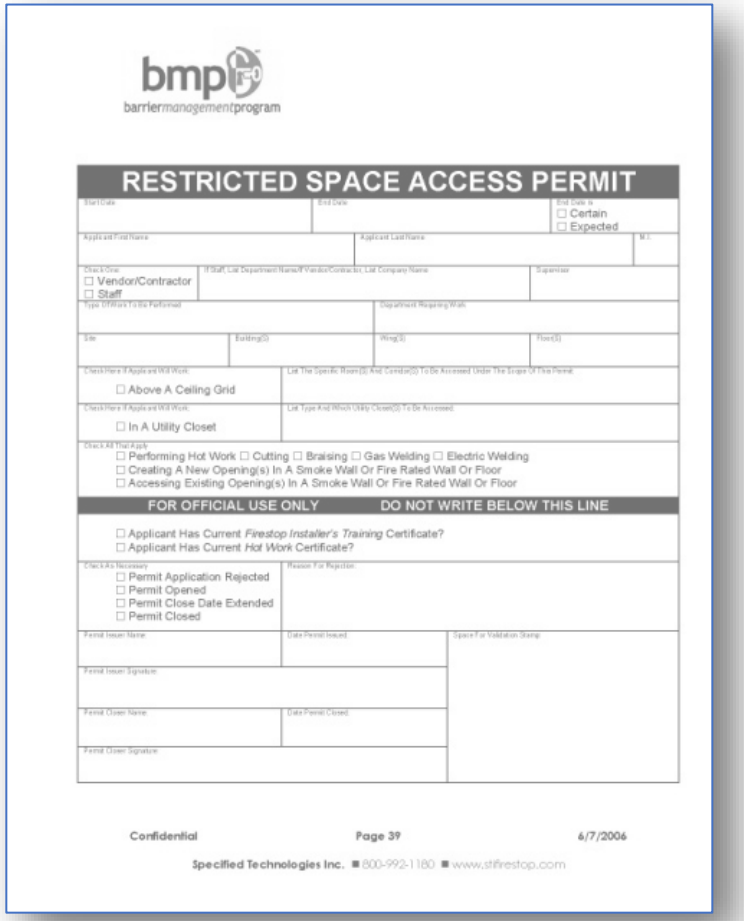
Specified Technologies Inc.
210 Evans Way Somerville, NJ 08876
Toll Free: (800)992-1180
Phone: (908)526-8000
FAX (908)231-8415
STI. E-Mail:techserv@stifirestop.com
Website:www.stifirestop.com

Trade specific submittals

Penetration permit form

- This permit will be given with a designated start.
- Determined by the facility.
- Will allow access above the ceiling.
- Could be displayed at all times.

NOT CONSIDERED A CLOSEOUT!



bmp barriermanagementprogram

RESTRICTED SPACE ACCESS PERMIT

Start Date | End Date | End Date is ☐ Certain ☐ Expected

Applicant First Name | Applicant Last Name | M.I.

Check One: ☐ Vendor/Contractor ☐ Staff | If Staff, List Department Name/If Vendor/Contractor, List Company Name | Supervisor

Type Of Work To Be Performed | Department Requiring Work

Site | Building(s) | Wing(s) | Floor(s)

Check Here If Applicable And Work: ☐ Above A Ceiling Grid | List The Specific Room(s) And Corridor(s) To Be Accessed Under The Scope Of This Permit

Check Here If Applicable And Work: ☐ In A Utility Closet | List Type And Which Utility Closet(s) To Be Accessed

Check All That Apply:
☐ Performing Hot Work ☐ Cutting ☐ Brazing ☐ Gas Welding ☐ Electric Welding
☐ Creating A New Opening(s) In A Smoke Wall Or Fire Rated Wall Or Floor
☐ Accessing Existing Opening(s) In A Smoke Wall Or Fire Rated Wall Or Floor

FOR OFFICIAL USE ONLY — DO NOT WRITE BELOW THIS LINE

☐ Applicant Has Current *Firestop Installer's Training* Certificate?
☐ Applicant Has Current *Hot Work* Certificate?

Check As Necessary:
☐ Permit Application Rejected
☐ Permit Opened
☐ Permit Close Date Extended
☐ Permit Closed

Reason For Rejection

Permit Issuer Name | Date Permit Issued | Space For Validation Stamp

Permit Issuer Signature

Permit Closer Name | Date Permit Closed

Permit Closer Signature

Confidential — Page 39 — 6/7/2006

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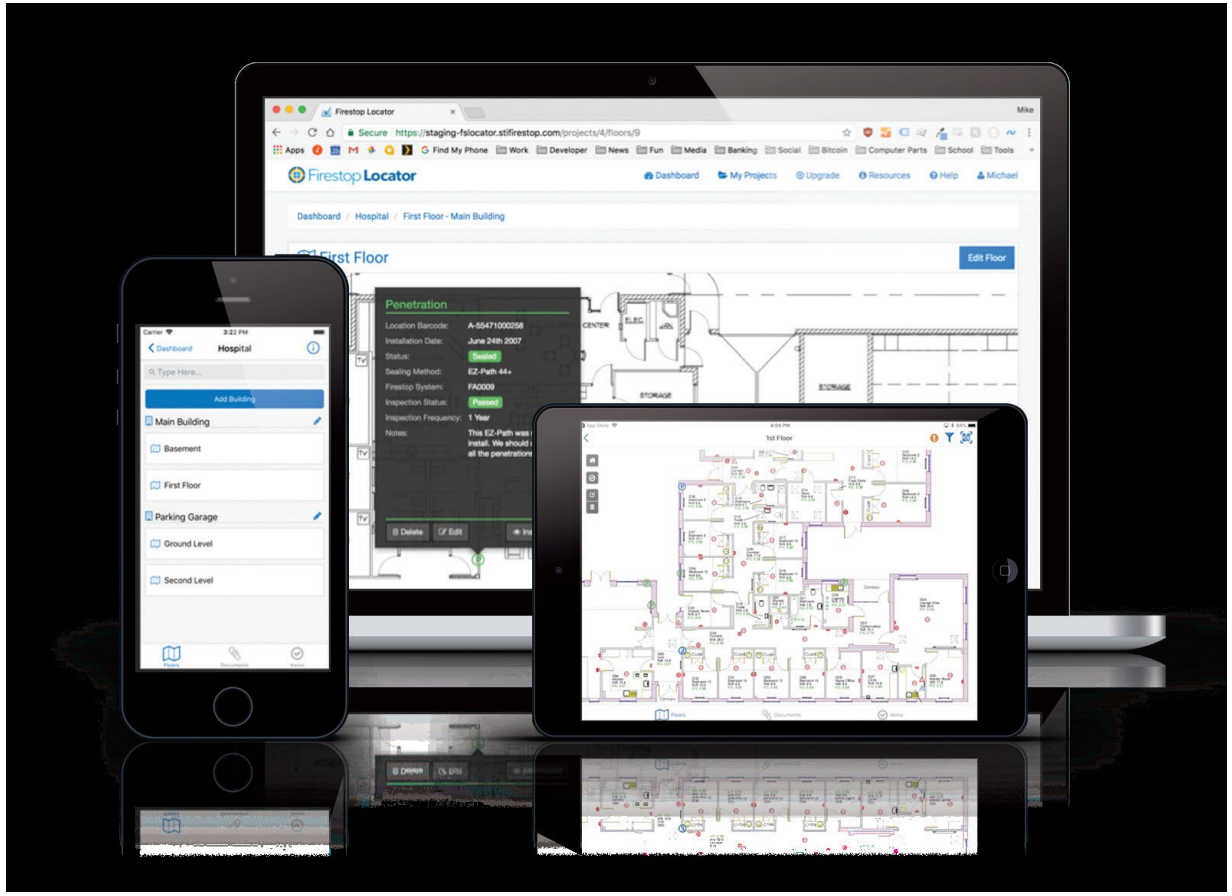
Proof of work performed!

- Knowledge
- Product Used
- Date Of Installation
- Contractor Information
- UL System#

Digital firestop locator programs can help

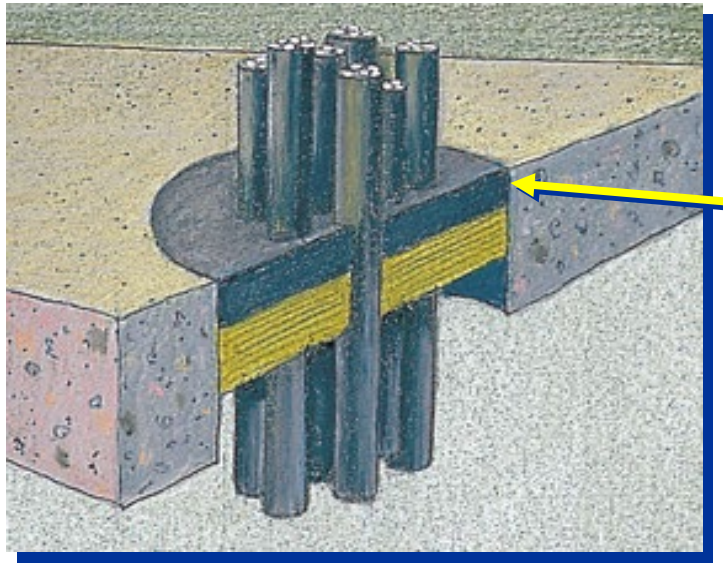
- Use mobile tools (phone, tablet, web)
- Platforms include both iOS and Android
- All functions can be done on either app or web
- **Interactive with underlying floor drawings**
- Streamline the Firestop tracking process
- Turn-key solution with pre-printed QR labels



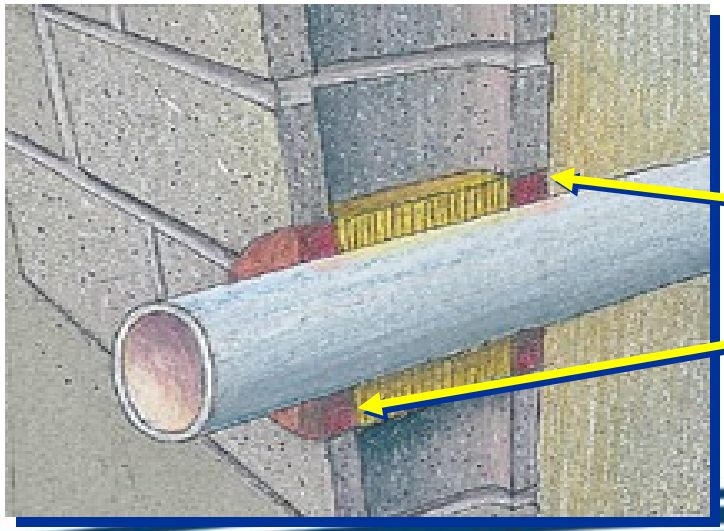
Training programs can help

- Firestop fundamentals
- Containment in construction
- Fire-rated barriers
- UL® Firestop System parameters and testing
- Firestop Penetrations
- High Traffic/Re-Enterable Applications
- Construction Joints
- Proper installations
- Proper products selection
- Myths about firestop

Fundamentals – Always refer to the tested system



Floor penetrations generally require only a seal from one side.



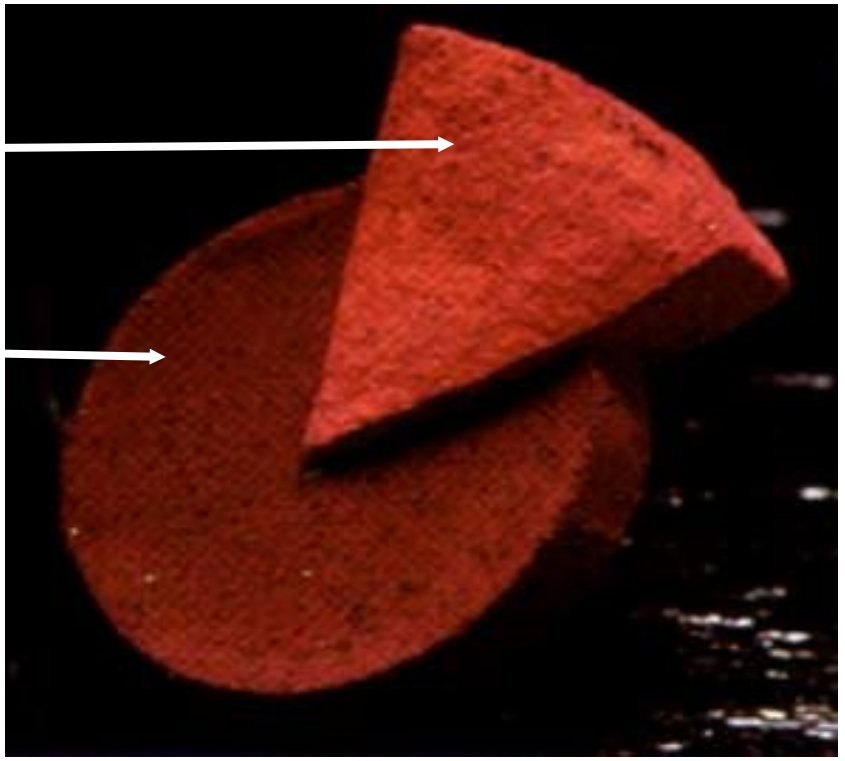
Wall penetrations , by contrast, almost always require a symmetrical installation, sealing both sides of the wall.

What is the principal of firestop materials?

Intumescence = Expansion With Heat

Expansion With Heat

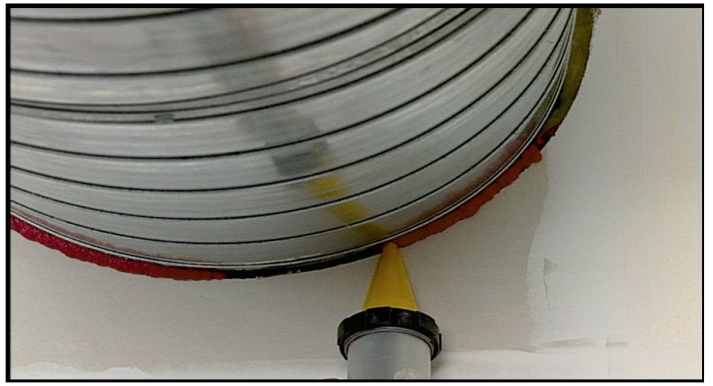
Before Heat Applied



Intumescent technology

Through-Penetrations

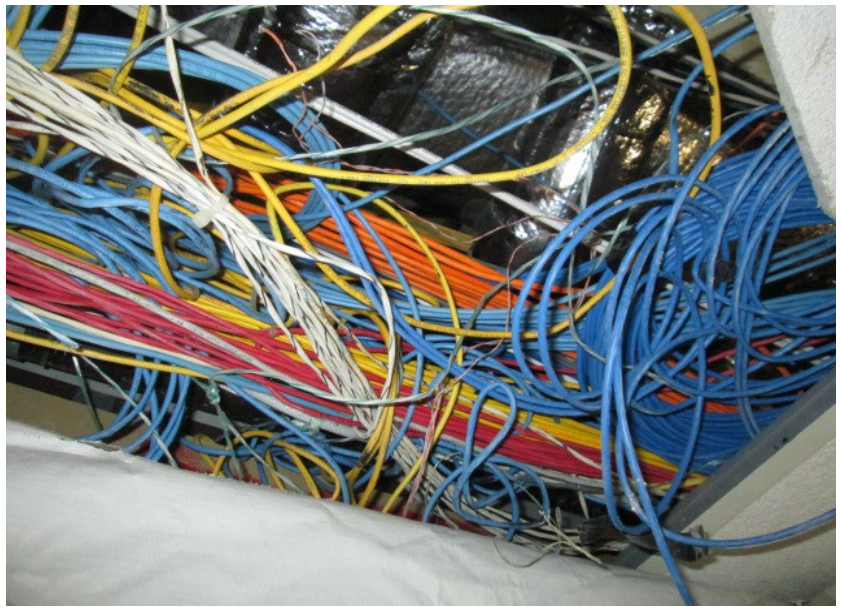
- Are there combustibles?
- Is there need for movement?

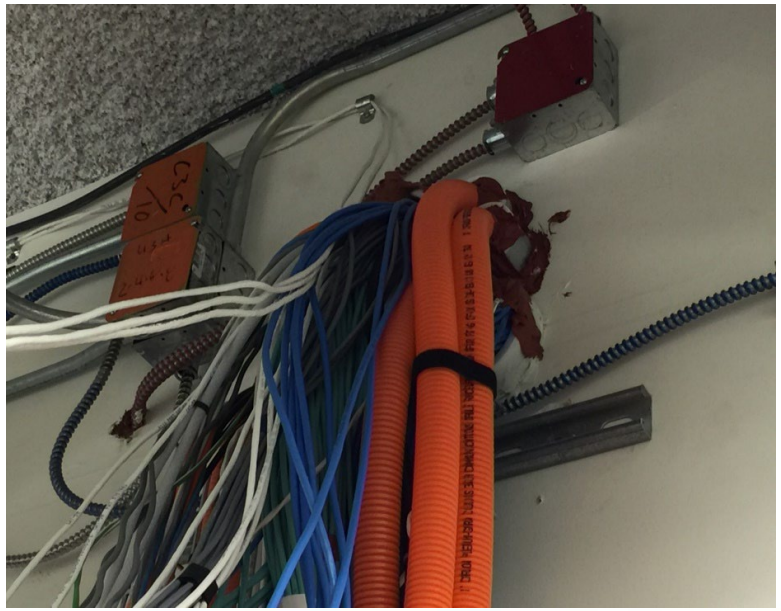


Healthcare Specific Issues

Key Firestop Compliance Issues

- Cable penetrations are large percentage% of findings.
- Infection Control, Acoustics
- Fire Barrier Management over time is a significant challenge for HC facilities.

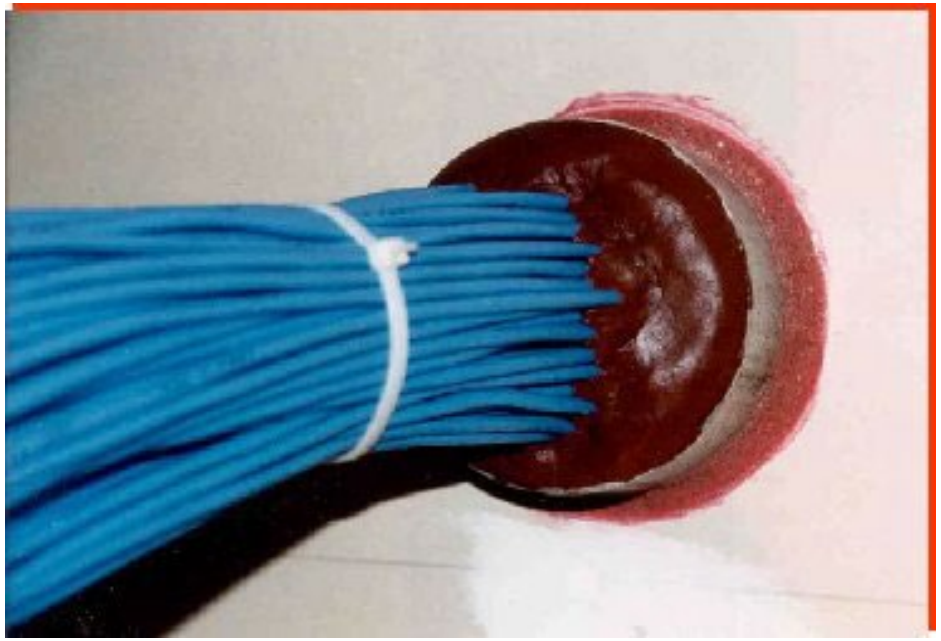




Traditional options for HTO's

Small Opening:

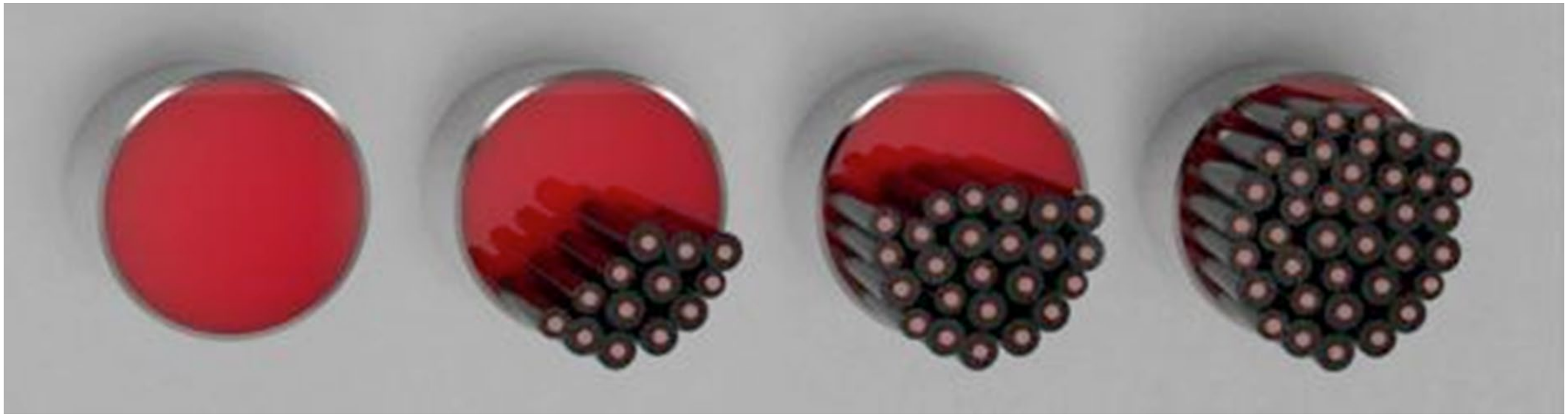
- Run sleeves through the wall or floor
- Firestop using sealant or putty

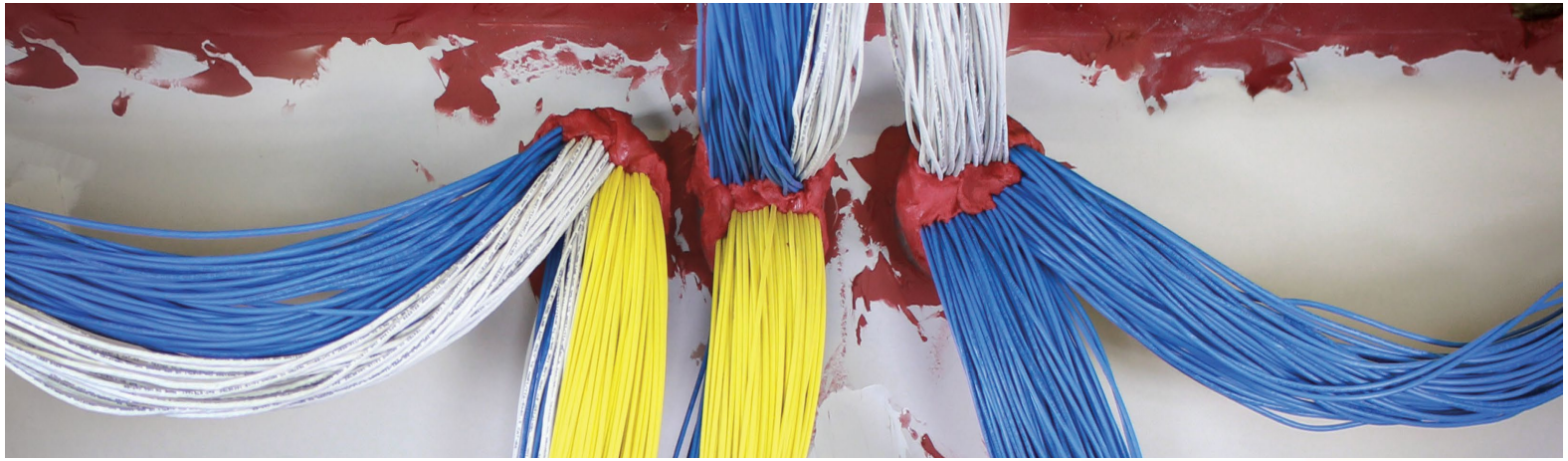


Medium to Large Openings:

- Stop tray before wall and run multiple sleeves
- Run tray through opening and use pillows

The life-cycle of the average datacom penetration



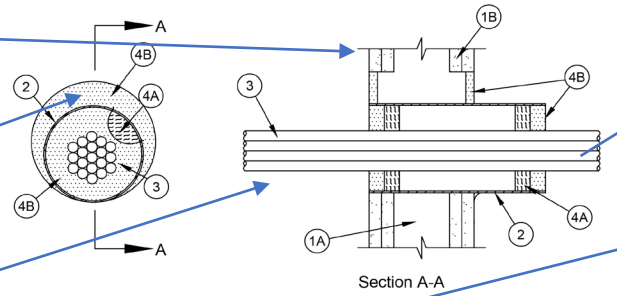


Datacom penetration example

- Rating
- Barrier
- Annular Space
- Penetrating item
- Firestop Material

System No. W-L-3210

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 3/4 Hr	FT Rating - 3/4 Hr
	FH Ratings - 1 and 2 Hr (See Item 1)
	FTH Rating - 3/4 Hr



Section A-A

1. **Wall Assembly** - The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs** - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (76 mm) wide and spaced max 24 in. (610 mm) OC.
   B. **Gypsum Board* -** Thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300, V300, U400 , V400 or W400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 6-1/2 in. (165 mm) when sleeve (Item 2) is installed. Max diam of opening is 4 in. (102 mm) when sleeve is not used.

   The hourly F rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Steel Sleeve - (Optional)** - Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT), steel conduit, Schedule 5 (or heavier) steel pipe sleeve or min 0.016 in. thick (0.41 mm, No. 28 ga) galv steel sleeve installed flush with wall surfaces. The annular space between the steel sleeve and periphery of opening shall be min 0 in. (continuous point contact) to max 2 in. (51 mm). When Schedule 5 steel pipe or EMT is used, sleeve may be installed flush with or extend up to 18 in. (46 cm) beyond one or both wall surfaces. Steel sleeve may be installed at an angle not greater than 45 degrees from perpendicular. Schedule 5 steel pipe or EMT sleeves may extend continuously beyond one wall surface. Sleeve to be rigidly supported when extending from the wall surfaces.

48%

3. **Cables** - Aggregate cross-sectional area of cables in steel sleeve to be max 48 percent of the aggregate cross-sectional area of the opening or sleeve. Cables to be bundled and rigidly supported on both sides of wall assembly. When the sleeve (Item 2) is installed, the annular space between the cables and the sleeve shall be min 0 in. (point contact) to max 1-1/2 in. (38 mm). When the sleeve (Item 2) is not used, the annular space between the cables and the opening shall be a min 0 in. (point contact) to a max 1/2 in. (13 mm). Cable bundle, using cables described below, may penetrate the wall at an angle not greater than 45 degrees. Any combination of the following types and sizes of copper conductor cable may be used:
   A. Max 200 pair No. AWG (or smaller) copper conductor cable with polyvinyl chloride (PVC) or plenum-rated jacketing and insulation.
   B. Max 3/C No. 2/0 AWG (or smaller) aluminum or copper conductor service entrance cable with PVC insulation and jacket.
   C. Max 3/C No. 8 AWG (or smaller) nonmetallic sheathed (Romex) cable with copper conductors, PVC insulation and jacket.
   D. Max 7/C No. 2/0 AWG (or smaller) multiconductor power and control cables with XLPE or PVC insulation and XLPE or PVC jacket.
   E. Max RG/U (or smaller) coaxial cable with fluorinated ethylene or plenum-rated insulation and jacketing.
   F. Max 62.5/48 fiber optic cable with PVC or plenum-rated insulation and jacketing.
   G. Max 4 pair No. 24 AWG (or smaller) copper conductor data cable with PVC or plenum-rated insulation and jacket.
   H. Max 4/C No. 2/0 aluminum or copper conductor aluminum or steel Metal-Clad# or Armored-Clad# cable.
   I. Max ¾-in. (19 mm) copper ground cable with or without a PVC jacket.
4. **Firestop System** - The firestop system shall consist of the following:
   A. **Packing Material** - When required (See table in Item 4B), min 1 in. (25 mm) thickness of min 4.0 pcf (64 kg/m3) mineral wool batt insulation firmly packed into each end of sleeve as a permanent form. Packing material to be recessed from each end of sleeve as required to accommodate the required thickness of fill material.
   B. **Fill, Void or Cavity Material* - Sealant or Putty -** Fill material applied to appropriate thickness within steel sleeve, flush with edges of steel sleeve on both surfaces of wall. Min 1/2 in. (13 mm) thickness of fill material installed into annular space between sleeve and wall flush with both surfaces of the wall. Min 1/2 in. (13 mm) diam bead of sealant or "rope" of putty shall be applied around the perimeter of the sleeve on each side of the wall when sleeve extends beyond surface of wall and is installed at continuous point contact. See table below for fill material thickness requirements around cables.

Sealant or Putty Type	Thickness, In. (mm)	Packing Material Required
SpecSeal Series SSS Sealant or LCI Sealant	1/2 in. (13)	Yes
SpecSeal Series SSS Sealant or LCI Sealant	1 in. (25)	No
SpecSeal Putty	1 in. (25)	No

SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LCI Sealant or SpecSeal Putty

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876
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Created or Revised: June 13, 2016
(800)992-1180 • (908)526-8000 • FAX (908)231-8415 • E-Mail:techserv@stifirestop.com • Website:www.stifirestop.com
W-L-3210

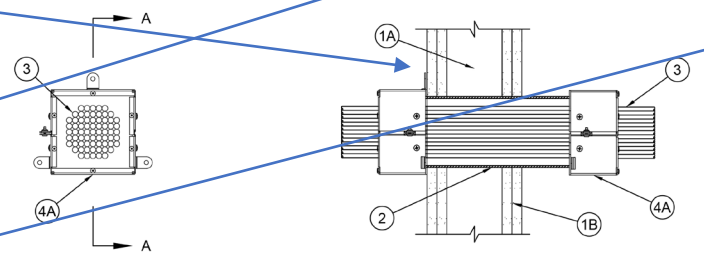
W-L-3210

Datacom penetration example

- Rating
- Barrier
- Annular Space
- Penetrating item
- Firestop Material

System No. W-L-3435

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 0 and 1/2 Hr (See Item 2)	FT Ratings - 0 and 1/2 Hr (See Item 2)
L Rating at Ambient - Less than 1 to 10.7 CFM/Device (See item 4C)	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating at 400 F - Less than 1 to 10.7 CFM/Device (See item 4C)	FTH Ratings - 0 and 1/2 Hr (See Item 2)
	L Rating at Ambient - Less than 0.47 to 5.05 L/s/Device (See item 4C)
	L Rating at 204 C- Less than 0.47 to 5.05 L/s/Device (See item 4C)



Section A-A

1. **Wall Assembly -** The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, V300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. **Gypsum Board*** - Thickness, type, number of layers, fastener type and sheet orientation shall be as specified in the individual U300, V300, U400 , V400 or W400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 5-1/2 in. (140 mm) when sleeve (Item 2) extends from wall surface. When sleeve is flush with wall surface, opening sized to outside diameter of sleeve. Max diam of opening is 4 in. (102 mm) when sleeve is not used.

   The F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall in which it is installed.

50-100% Fill

2. **Steel Sleeve -** (Optional) - Nom 1-1/2 in. (38 mm), 2 in. (51 mm), 3 in. (76 mm) or 4 in. (102 mm) diam steel electrical metallic tubing (EMT), steel conduit, Schedule 5 (or heavier) steel pipe sleeve or min 0.016 in. thick (0.41 mm, No. 28 ga) galv sheet steel sleeve installed flush with wall surfaces. The annular space between the steel sleeve and periphery of opening shall be min 0 in. (continuous point contact) to max 1 in. (25 mm). Sheet steel sleeve to be installed in continuous point contact only. When Schedule 5 steel pipe, steel conduit or EMT is used, sleeve may be installed flush with or extend up to 3 in. (76 mm) beyond one or both wall surfaces. When sleeve projects from wall surface, it may be provided with a metallic or nonmetallic conduit bushing. Steel sleeve may be installed at an angle not greater than 45 degrees from perpendicular. Schedule 5 steel pipe, steel conduit or EMT sleeves may extend continuously beyond one wall surface. Sleeve to be rigidly supported when extending from the wall surfaces.

   When sleeve is flush with wall surface in 2 Hr rated assemblies, the T, FT, and FTH Ratings are 1/2 Hr. Otherwise, the T, FT, and FTH Ratings are 0 Hr.
3. **Cables -** Cables may represent a min 50 to max 100 percent visual fill within the loading area for the sleeve, a nom 2 in. (51 mm) diam opening or a nom 4 in. (102 mm) diam opening. Cables to be rigidly supported on both sides of the wall assembly. Any combination of the following types and sizes of cables may be used:
   A. Max 400 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) or plenum-rated jacketing and insulation.
   B. Max 750 kcmil single copper conductor power cable with XLPE jacket and insulation.
   C. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
   D. Max 3/C No. 2/0 AWG metal clad or armored cable with steel or aluminum jacket.
   E. Max 3/C No. 8 AWG NM cable (Romex) with PVC insulation and jacket.
   F. Max four pair No. 22 AWG (or smaller) copper conductor data cable with PVC or plenum rated jacketing and insulation.
   G. Max four pair No. 22 AWG (or smaller) Cat 5, Cat 5E, Cat 6 or Cat 6A cable with PVC or plenum rated jacketing and insulation.
   H. Coaxial cable with fluorinated ethylene or PVC insulation and jacketing having a max diam of 5/8 in. (16 mm).
   I. Optical fiber cable with PVC or polyethylene (PE) jacket and insulation and having a max diam of 5/8 in. (16 mm).
   J. Max RG6/U coaxial cable with fluorinated ethylene, polyethylene (PE), PVC or plenum rated jacketing and insulation.
4. **Firestop System* -** The firestop system shall consist of the following:
   A. **Firestop Device -** A firestop device consisting of a rectangular galv steel housing with intumescent curtain sized to the specific diam of the sleeve or opening. Firestop device installed in accordance with the accompanying installation instructions on each side of the wall. Firestop device secured to end of sleeve when sleeve extends from wall surface. When sleeve extends continuously beyond one wall surface, firestop device shall be installed only on the side of the wall with a sleeve termination. When sleeve is flush with wall surface or when sleeve is not used, firestop device secured to assembly using provided anchor tabs by means of 1/8 in. (3.2 mm) diam by 1-3/4 in. (44 mm) long steel molly bolts or toggle bolts in conjunction with min 1-1/4 in. (32 mm) diam steel fender washers.

      SPECIFIED TECHNOLOGIES INC - EZ PATH Retrofit Device EZDR200 or EZDR400

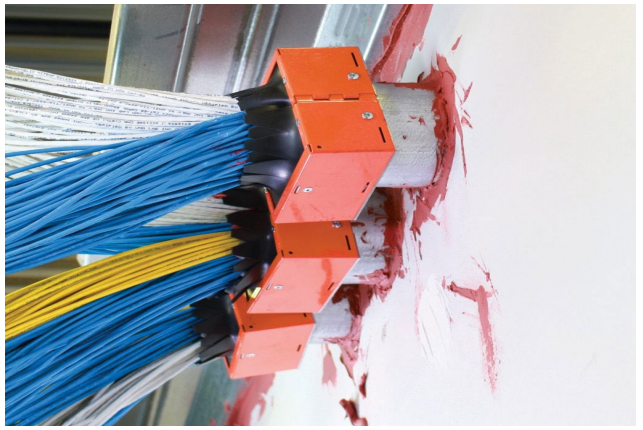
   A1. **Firestop Device* -** (Not Shown) - When nom 1-1/2 in. (38 mm) or nom 3 in. (76 mm) diam steel sleeve is used, an appropriately sized steel plate adaptor kit shall be used in conjunction with Item 4A. The steel plate shall be installed in accordance with the accompanying installation instructions.

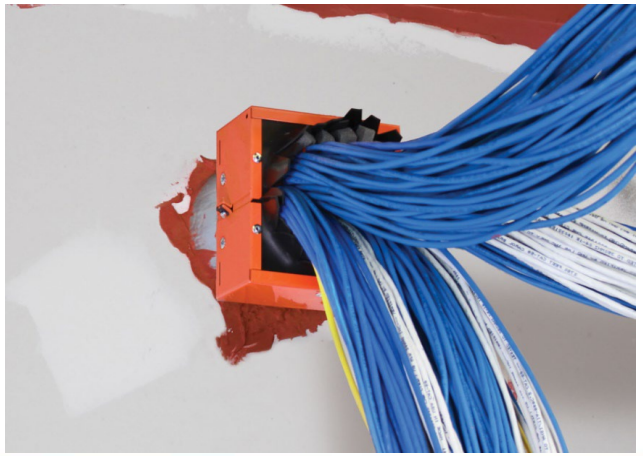
      SPECIFIED TECHNOLOGIES INC - EZ PATH Retrofit Device Plate Kit EZPR150 or EZPR300

   B. **Fill, Void or Cavity Material* - Sealant or Putty -** (Optional, Not Shown) Any existing XHHW sealant or putty either partially or fully installed into one or both ends of the steel sleeve. When annular space is present between the sleeve and the periphery of the opening, a min 5/8 in. (16 mm) thickness of any existing XHHW sealant or putty shall be applied within the annulus, flush with both surfaces of wall.
   C. **Fill, Void or Cavity Material* - Sealant or Putty -** (Optional, Not Shown) - Min 1/2 in. (13 mm) thickness of sealant or putty applied within annulus, flush with both ends of sleeve. When annular space is present between the sleeve and the periphery of the opening, a min 1/2 in. (13 mm) thickness of sealant or putty shall be applied within the annulus, flush with both surfaces of the wall.

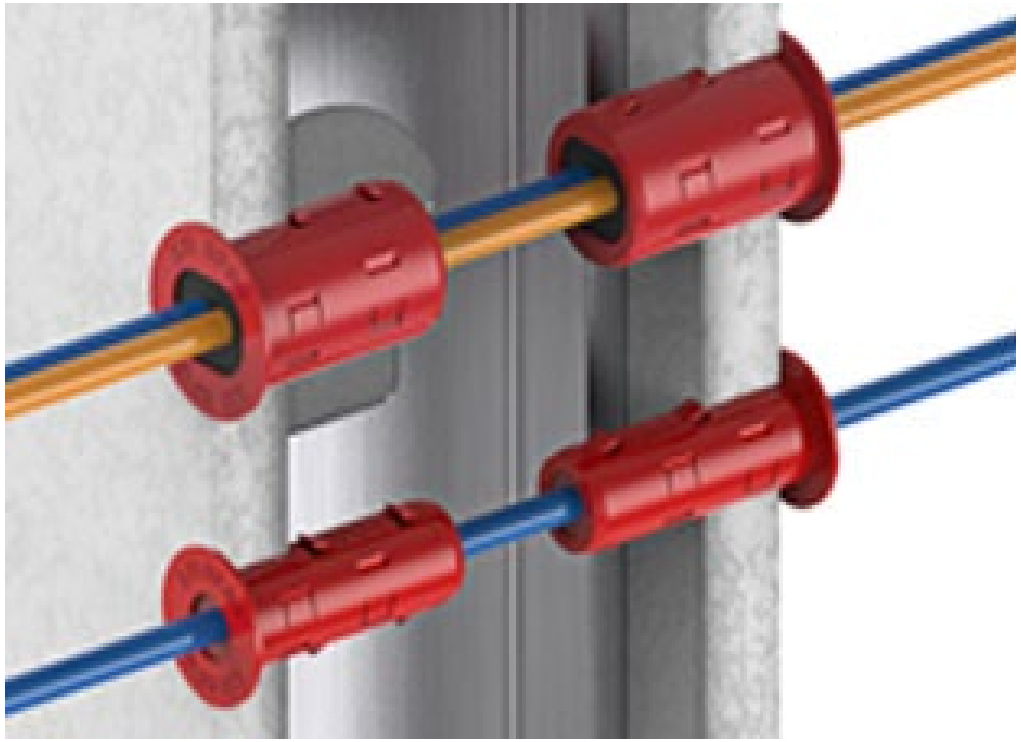
W-L-3435

Sleeves become overloaded over time which leads to non-compliance





Even small cable penetrations can be a problem…

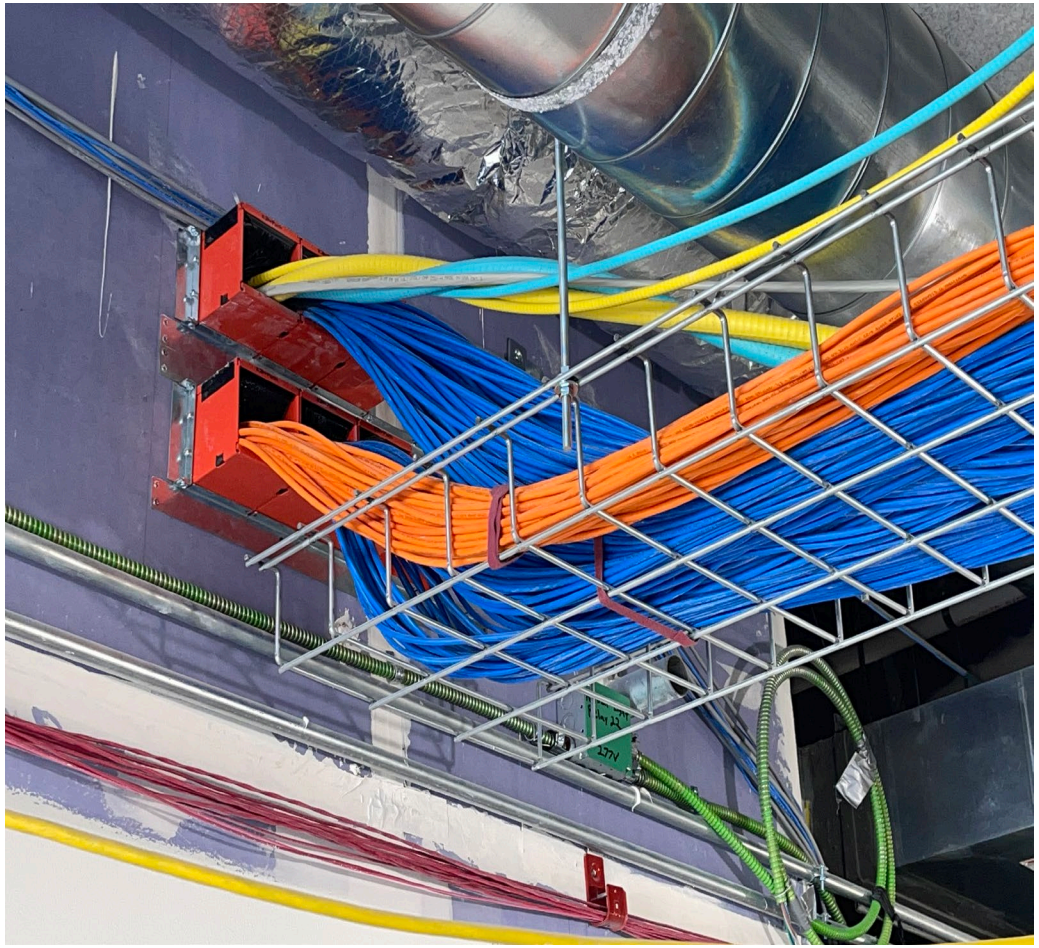


…without the right solution.

Self-Contained fire-rated pathways

Your Best Option!

Sustainable Solution



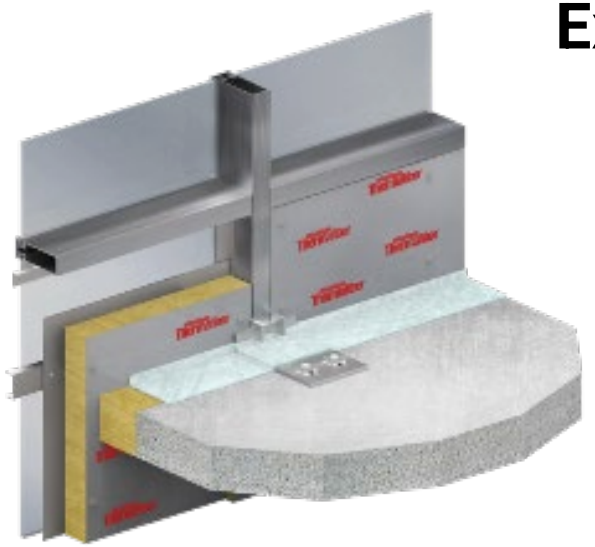
Unsealed or overloaded cable trays?

Containment in construction

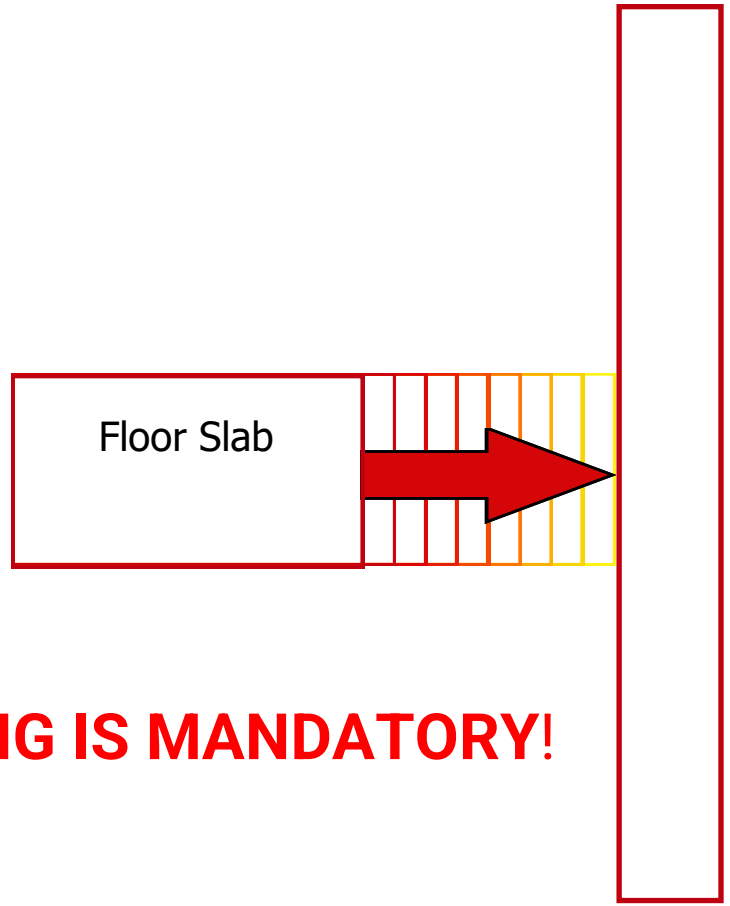
Construction Joints

Containment in construction

Curtain Wall Joints



Extending the rated floor to the exterior wall.

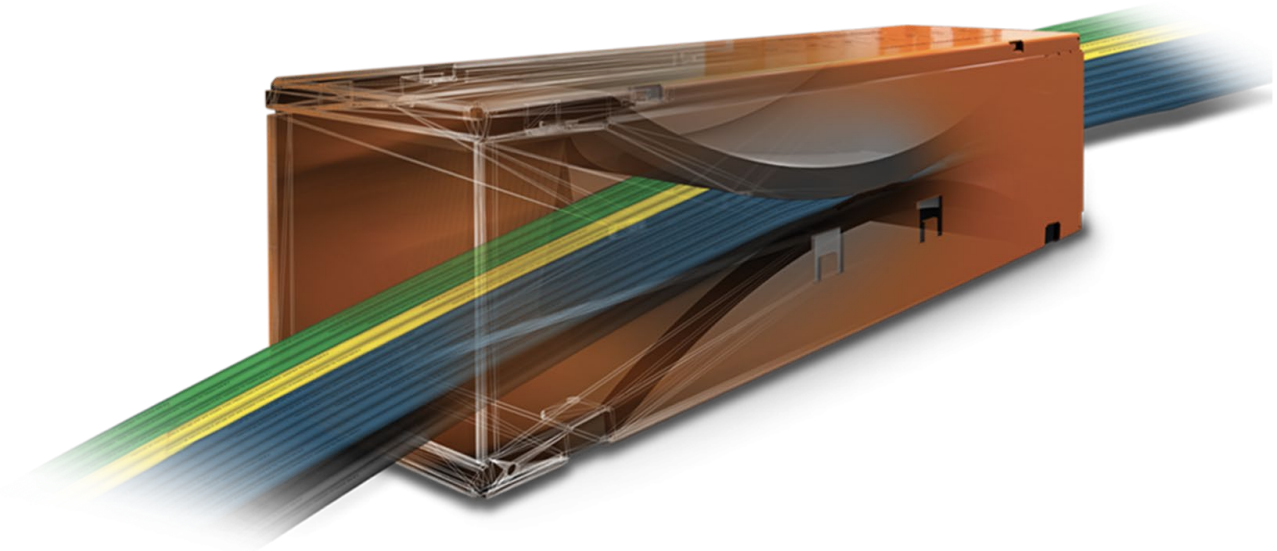


FIRESTOPPING IS MANDATORY!

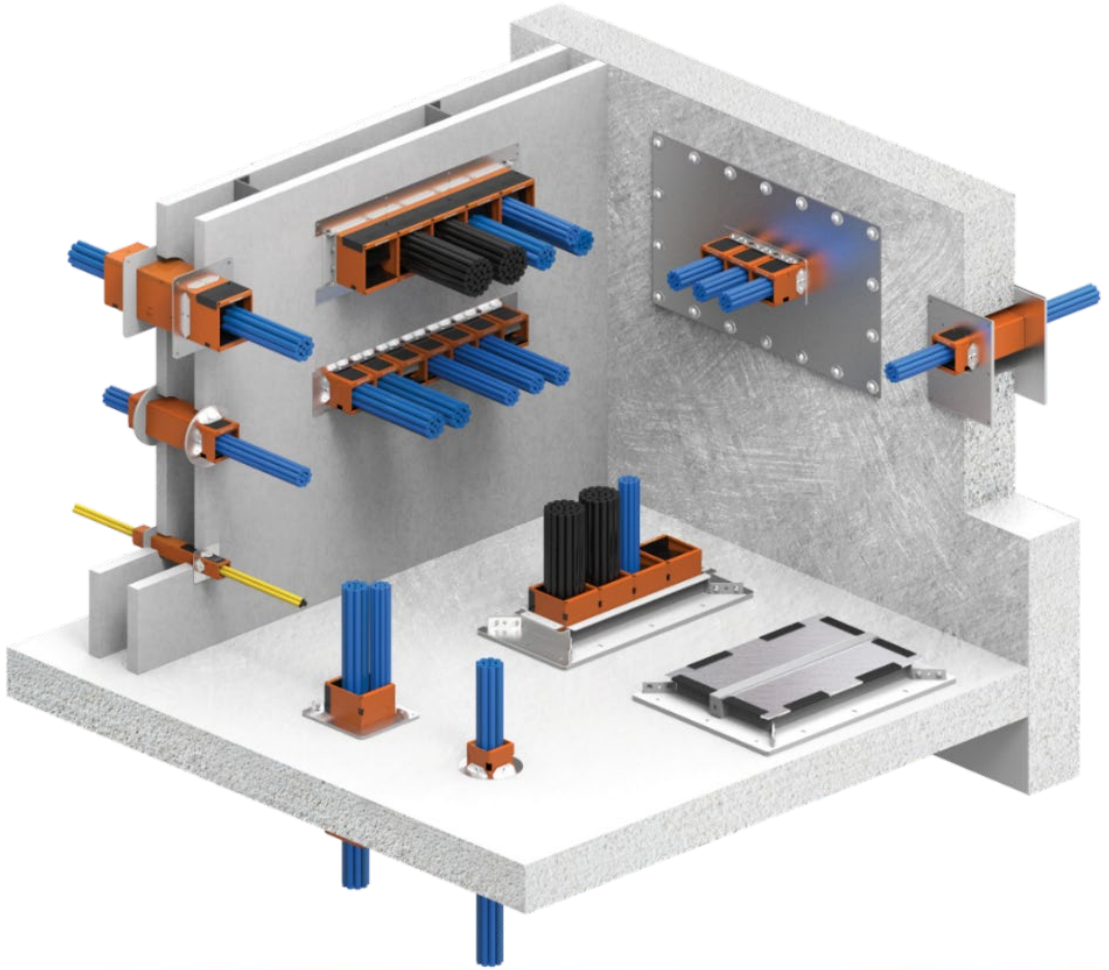
The safing slot must be sealed in a manner that extends this rating to the exterior wall surface. The Mineral Wool used to seal the gap must be installed vertically in the safing slot not horizontally!

This concludes the AIA educational portion

Product Selection – Electrical & DataComm



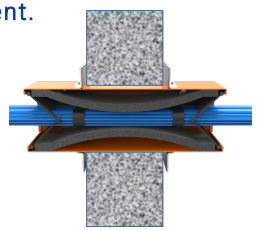
EZ-Path®
FIRE RATED PATHWAY

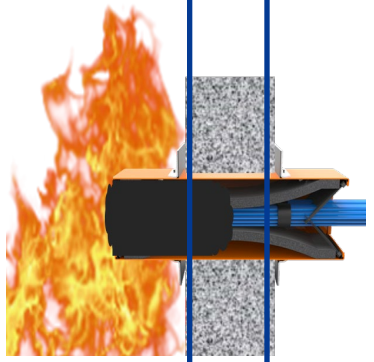


EZPath - Example of a 4-hour Fire Test

Before the Fire Test

For this system, EZ-Path are directly grouted in the concrete wall using mortar / cement.





Fire Side

Non-Fire Side

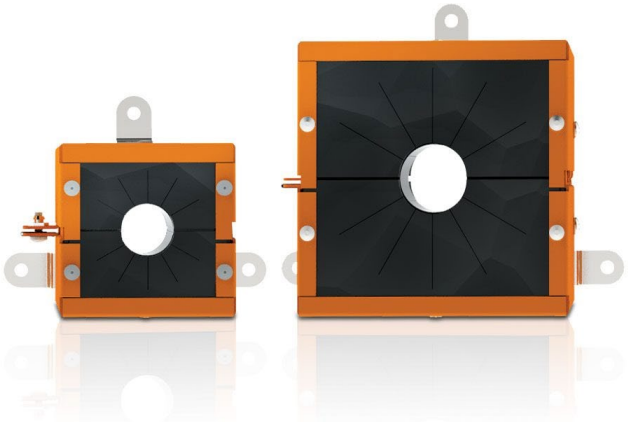
After 240 Minutes of Fire Exposure

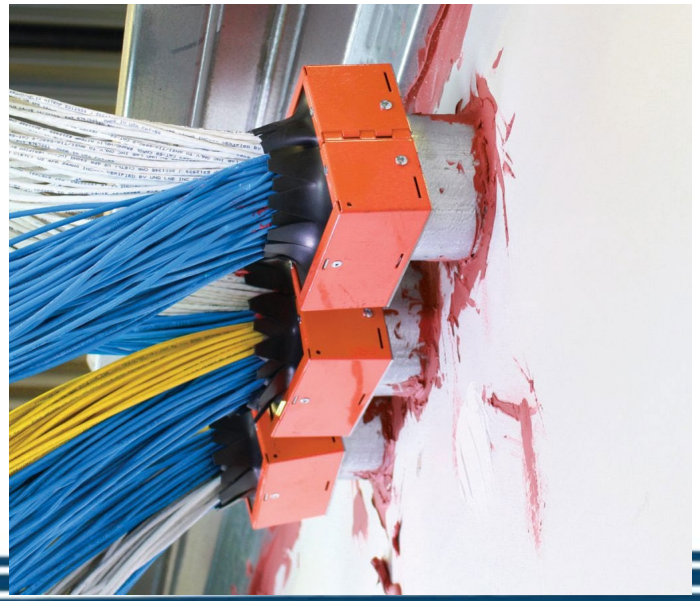
Intumescent Technology

Product Selection – Electrical & DataComm

EZ-Path Retrofit Device

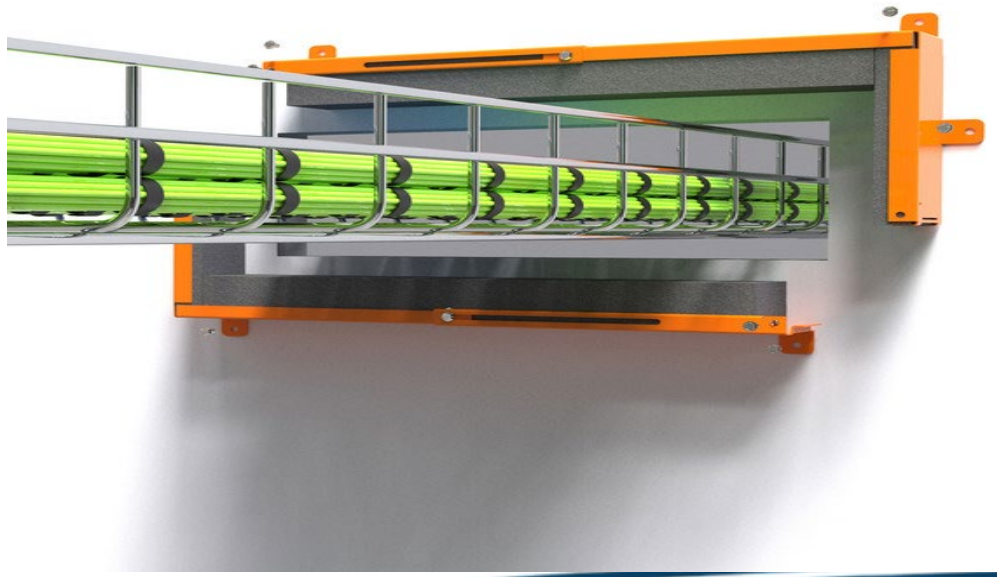
- Two-part clam shell design
- Installs around projecting sleeves & cable bundles
- Up to 100% visual fill
- 2” & 4” metallic sleeves
- Designed for cable sleeves and stubs
- Professional fit and finish
- Safety Orange for easy identification

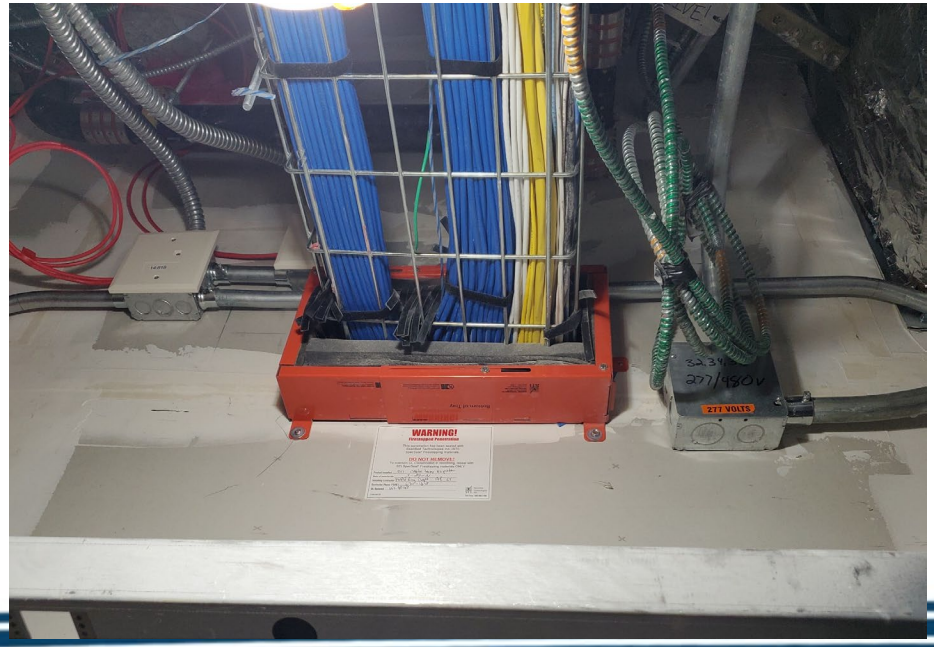




EZ Path Cable Tray Retrofit Device

1. The EZ Path Cable Tray Retrofit Device quickly and easily remediates existing cable trays of up to 100% visual fill, restoring the fire performance without the need for additional for additional firestop products
2. Its' two-part design installs around non-compliant cable tray penetrations, restoring fire and smoke leakage performance ratings
3. Sizes available for 12in. or 18in. Wide cable trays (304.8mm to 457.2mm)

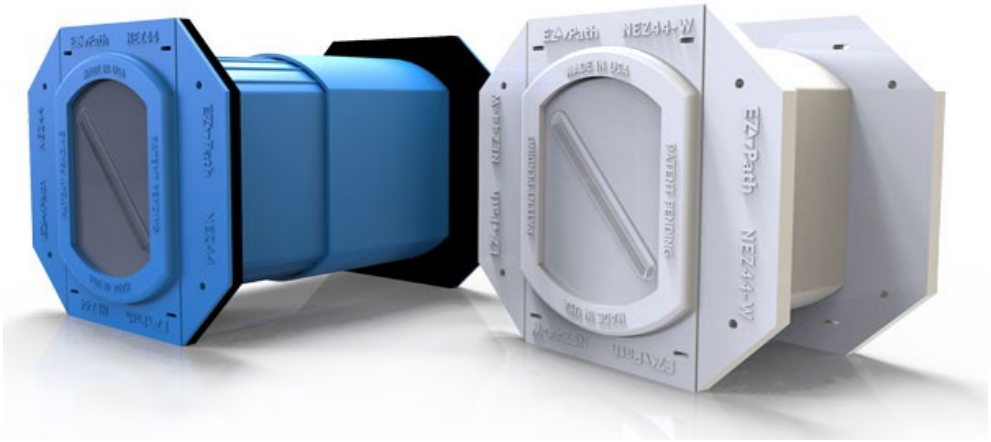




Non-Rated Cable Management

Smoke Partition Penetrations

- Non-rated floors and walls
- Sealing for other reasons
- Ease of entry
- 0 to 100% visual fill
- Clean cable management system



Non-Rated Cable Management

Other non-rated areas

Adjusting to a new way of conducting care to infected patients

- Decrease nursing exposure to the room
- Nursing stations set up outside each room.

(Courtesy of © MSKCC, 2020, Memorial Sloan Kettering Cancer Center, New York, New York)
(Thanks to the Society for Critical Care Medicine for these bullet points)

IV tubes are run under the door.

- Clinical Considerations

  Placing the pumps outside the rooms allows the nurses to titrate continuous infusions and administer IV push and intermittent IV piggyback medications without entering the room.

Cables, tubes and chords running under door can create a trip hazard.

Clinician Patient Access Device

Composite Sheet

- Rubber-based compound cast on a sheet metal panel.
- Utilizes wire mesh reinforcement as a char stabilizer and attaches to the wall or floor surface.

Critical Circuits and Infrastructure

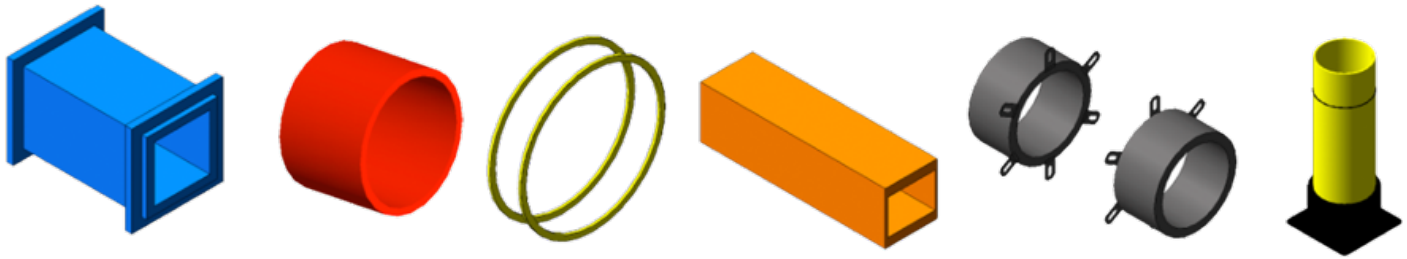
E-Wrap Can Save Bucks!

- Fire pumps
- Signaling equipment
- Elevators
- Alarms
- Process control equipment
- Emergency Responder Communications Enhancement Systems (ERCES)
- These systems can be incased in concrete (COSTLY)
- Placed in a shaft or chase (Real-Estate)

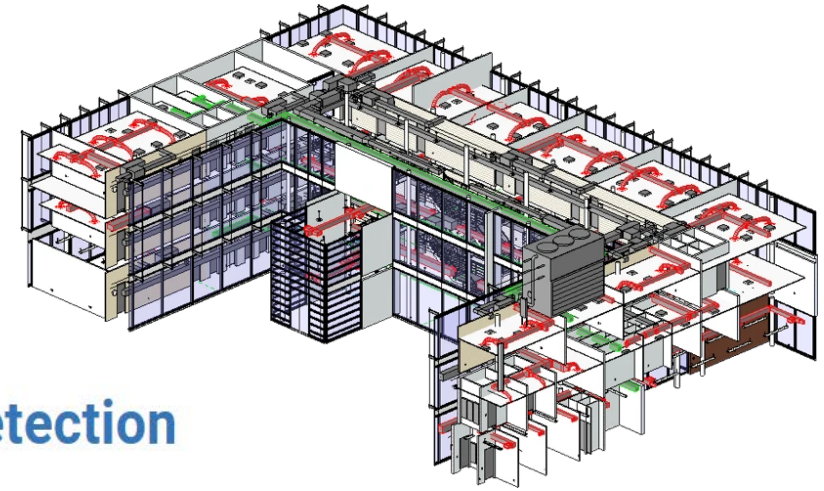
BIM objects for architects and engineers to import into building models.

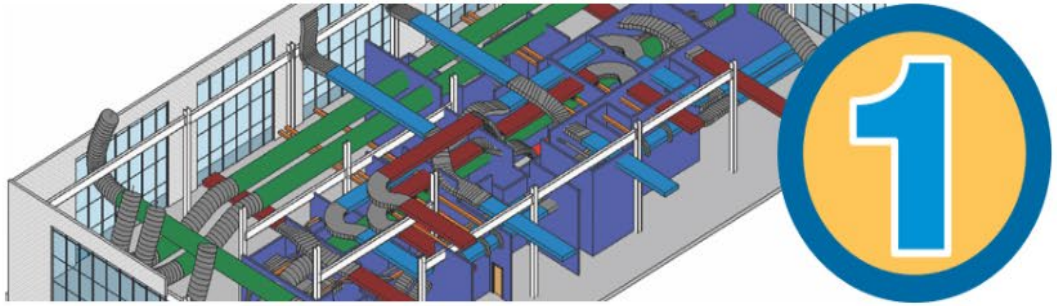
Developed using Autodesk Revit®, these objects offer a quick and effective method to integrate firestop into your complex building design.

- Penetrations
- Construction joint
- Curtain wall
- Smoke & Acoustical



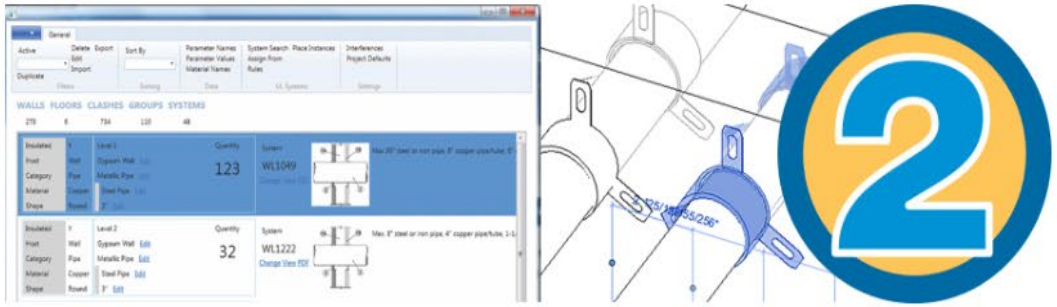
FCM
FIRESTOP CLASH MANAGEMENT





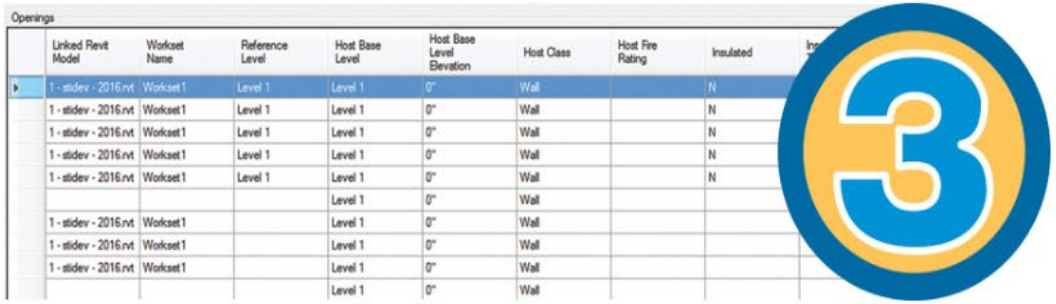
Step 1: Clash Detection

Scan the Revit® model to find clash points where firestopping is required.



Step 2: System & Product Selection

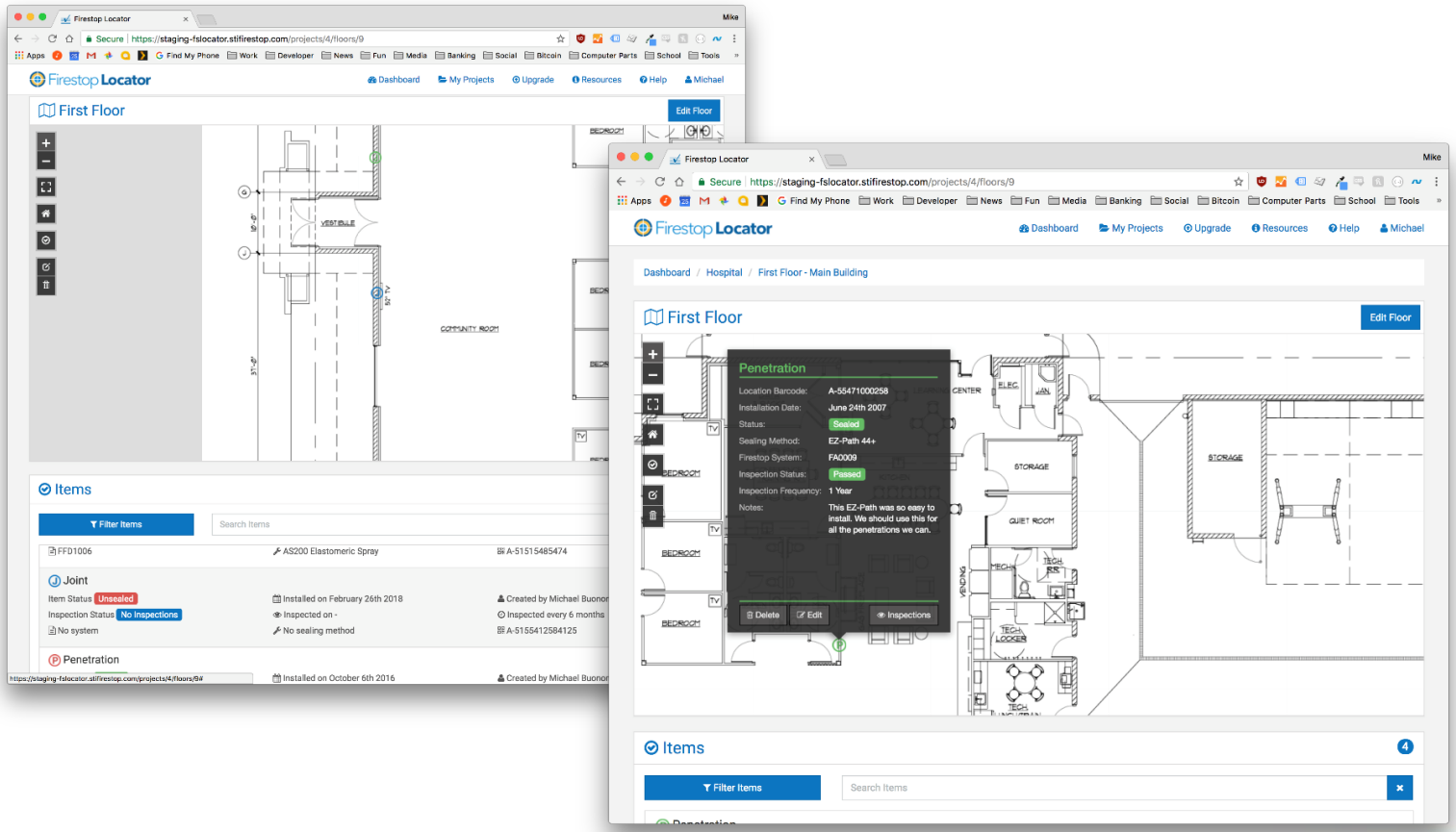
Firestop systems are selected and automatically assigned to each clash point. Chooses the correct firestop product every time and imports relevant information into the model.

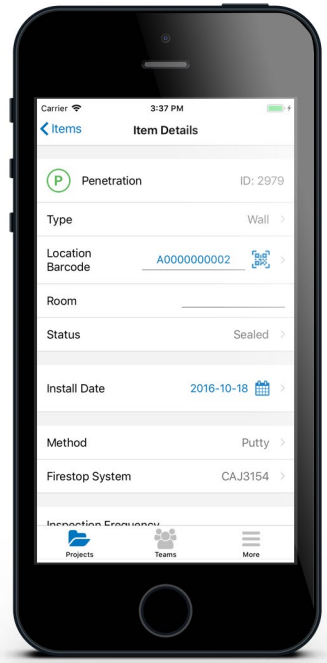


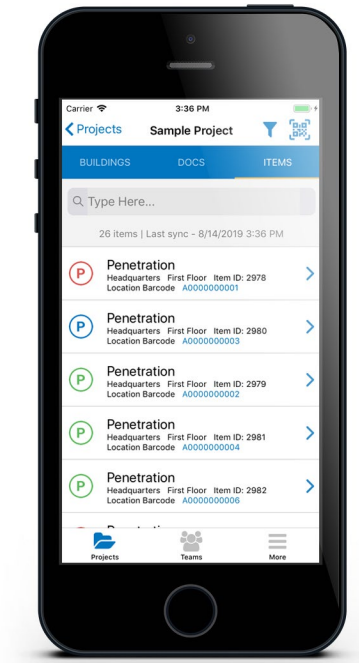
Step 3: Openings Report

Generates openings reports with assembly details and firestop system information for coordination meetings.

Firestop Locator





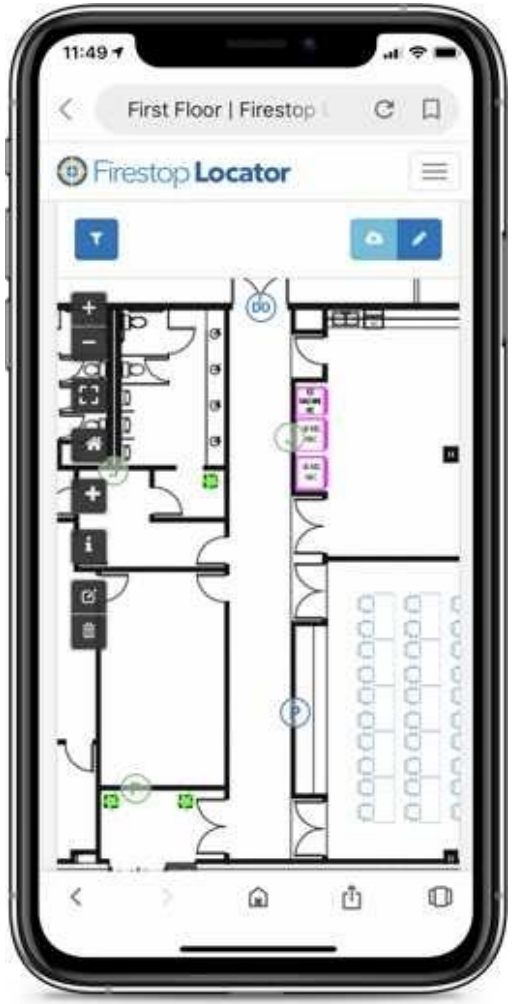


Firestop, Smoke, & Sound Solutions

Specified Technologies Inc.
We engineer peace of mind.

Firestop Locator

- Phone, tablet or web
- iOS and Android
- Interactive with underlying floor drawings
- Streamline the Firestop tracking process
- Accounts made through Access STI to increase traffic for web tools
- Turn-key solution with pre-printed QR labels
- Custom items (coming March 2023)



Firestop Instructional Training for Health Care

Firestop Training to suit your needs:

- Firestop 101 (Basic training)
- Level I (In-service training)
- Level 2 (Resident expert)

Topics include:

- Firestop fundamentals
- Containment in construction & testing
- Code requirements
- Managing fire-rated barriers
- A UL® system approach
- Proper product selection & installation
  - MEP Penetrations
  - HTO – High Traffic Openings
  - Construction Joints

What Does This All Mean?

- Establish a **Standard** that all can follow
- Establish a training program for installers and inspection
- Understanding of expectations by all involved
- Create a battery of systems that fit your facility
- Create an inspection check list of work performed
- Collection of data to support work
- Utilize a specialty firestop contractor
- Deliver a long-term “Sustainable” facility.

Test your knowledge

1. The goal of firestopping is to contain smoke, fire and products of combustion to their point of origin, this is commonly called:
    a. Active Suppression
    b. Early Detection
    c. Passive Containment
    d. Egress

2. UL systems are two things for installers, they are a set of build instructions and:
    a. Firestop backer material
    b. Evidence of compliance
    c. Approvals
    d. The answer to all of life's questions

3. A PCRA approach to firestopping in health facilities would require a pre construction risk assessment.
    a. True
    b. False

4. References for specifying firestopping can general be found under thermal and moisture protection in:
    a. Division 6
    b. Division 7
    c. Division 8
    d. Division 20

5. The term HTO in regards to cabling penetrations stands for:
    a. Heavily targeted outlet
    b. Heinously treated openings
    c. High traffic openings
    d. Hefty tight orifice

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Questions & feedback for our presenter

Nathan Waye

Northwest Regional Healthcare Manager

nwaye@stifirestop.com

Please leave us feedback on

LinkedIn

Specified Technologies Inc.

Mission: To provide innovative and cost-effective firestop, smoke, & sound solutions.

- Your global partner in Passive Fire Protection Solutions
- Firestopping is our business, we dedicate all our resources on providing the highest quality, fully tested, innovative firestopping solutions
- Systems are user-driven, making them easier to install—often at lower overall costs

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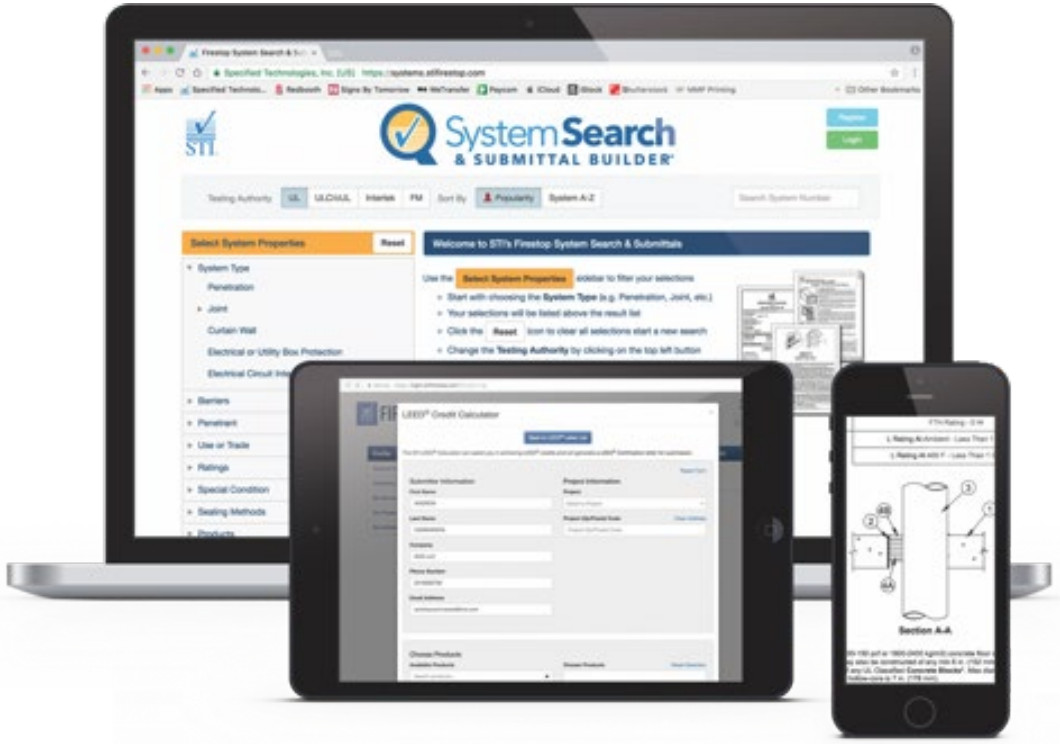

Google Play

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BMP BARRIER MANAGEMENT PROGRAM

gets everyone on the same page…

- Systems for the project or facility are selected during planning and customized as needed during construction

- Systems are organized by trade:
  - Electrical
  - Plumbing
  - Mechanical
  - Sprinkler
  - Drywall
  - Mason
  - Data
  - Etc.

…by streamlining and clarifying the parameters of the job

Engineering Support SERVICES

Live chat on our app or online… www.stifirestop.com

techserv@stifirestop.com

1-800-992-1180

Chat

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Firestop Training

The Firestop University

Welcome to The Firestop University

The Firestop University is an easy way to increase firestopping products and systems knowledge, plus help to improve your installation techniques. Our courses are designed to teach you the importance of firestopping to life safety and code compliance in modern construction.

Our mission is to be the leading global provider of firestop training and continuing education.

Our trainings are offered in three formats; attend a live training session, attend a live webinar, or learn at your own pace on-line. We even have courses that allow you to run your own training sessions as the resident expert.

The Firestop University

AIA Continuing Education | Bicsi | ICC PREFERRED EDUCATION PROVIDER

- Firestop 101
- Firestopping Key Points
- Interior Finish Firestopping
- Firestop SOP for Healthcare
- Firestopping Requirements in the IBC
- Firestopping Engineering Judgements
- The Basics of Perimeter Fire Containment
- Endothermic Wraps: Thermal Protective Systems
- Firestop Specifications: What Architects Need to Know
- Perimeter Fire Barrier Systems - Hybrid Window Wall Designs
- Advanced Perimeter Fire Containment Systems for Galvanized Backpan Assemblies

LU/HSWs, CECs & CEUs at your convenience

Online

Webinars

Lunch & Learns

Credly