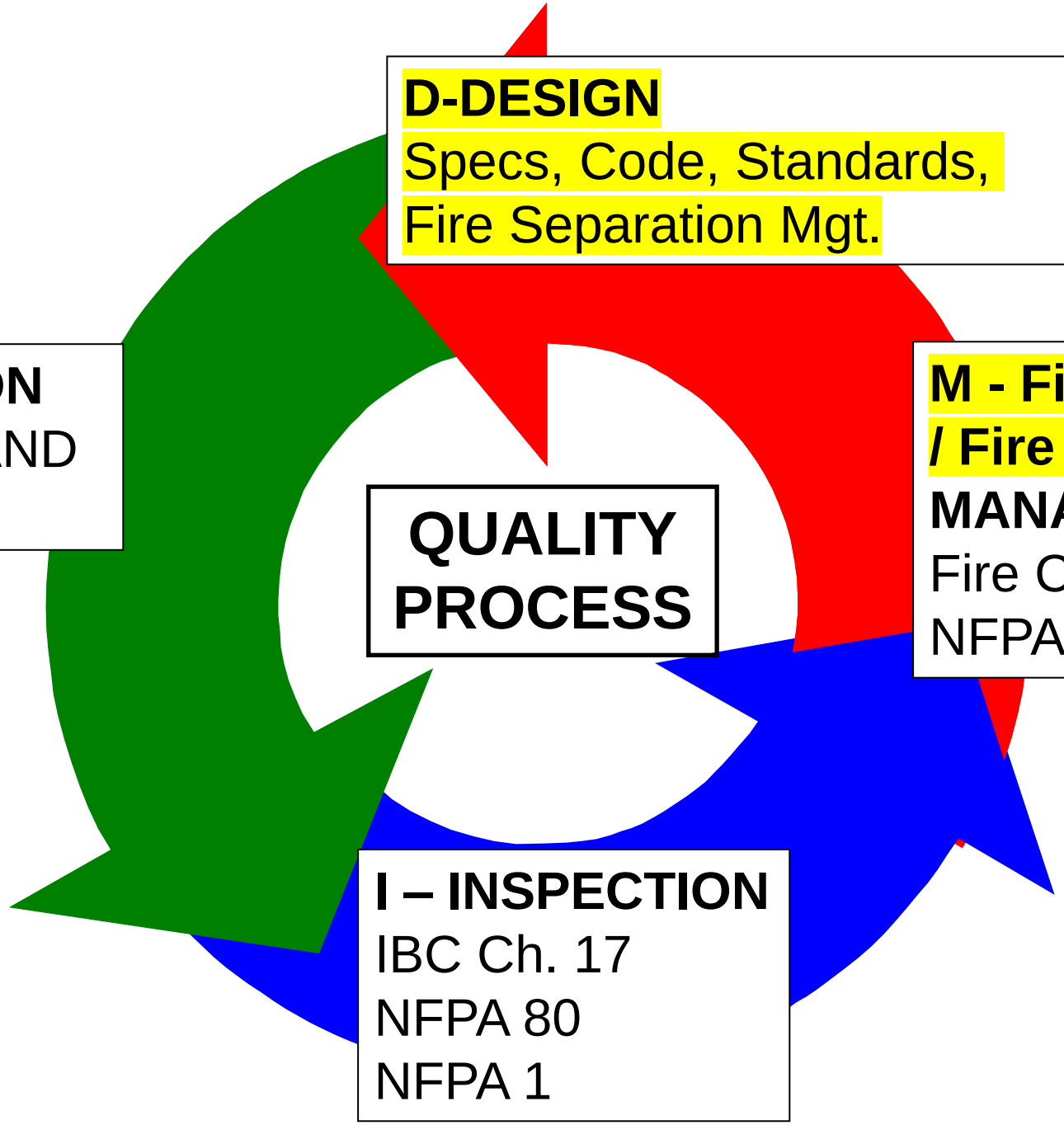
Design
Installation
Inspection
Maintenance & Management

Bill McHugh
FCIA Executive Director
Bill@FCIA.org
Bill@NFCA-online.org

FCIA

NFCA®
National Fireproofing Contractors Association



D-DESIGN
Specs, Code, Standards,
Fire Separation Mgt.

I-INSTALLATION
MS Programs AND
Mfr. Education

QUALITY PROCESS

M - Fire Separation / Fire Wall MANAGEMENT
Fire Codes
NFPA 101, 1, IFC

I – INSPECTION
IBC Ch. 17
NFPA 80
NFPA 1

Facility Maintenance Budget Line Items… Questions you ask…do you maintain???

- Fire-Sprinklers, Pumps, etc…**YES**
- Fire-Detection & Alarms…**YES**
- Fire Separations / Barriers? – **WHAT?**
  - Walls and Floors
  - Firestopping
  - Fire Dampers
  - Fire Doors – Rolling/Swinging
- Fireproofing – STILL THERE?
- OPEN DOOR&LOOK UP!

What is a Firestop System?

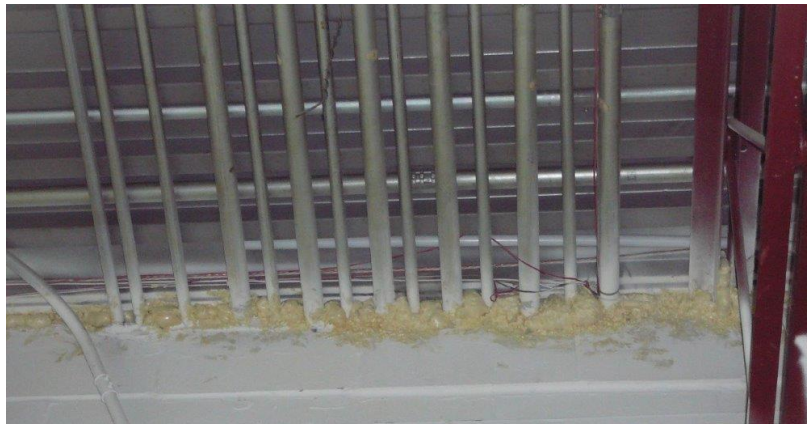
- Firestop Sealant?
- Firestop Products??
- Fire-Resistance-Rated Floors, Walls?
- Manufacturer’s Product Data Sheets?
- Manufacturers Sell Sheets?
- Safety Data Sheets?
- ULC Listings?
- ***Wouldn’t it be cool if…..***

Consider Requesting Building Personnel…

Normal ask…

Please fill, plug the holes

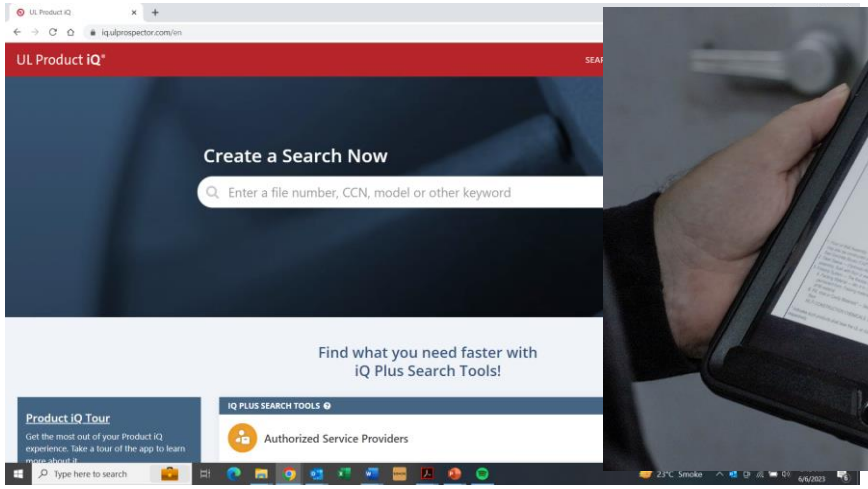
= Foam, Mud, Stuff

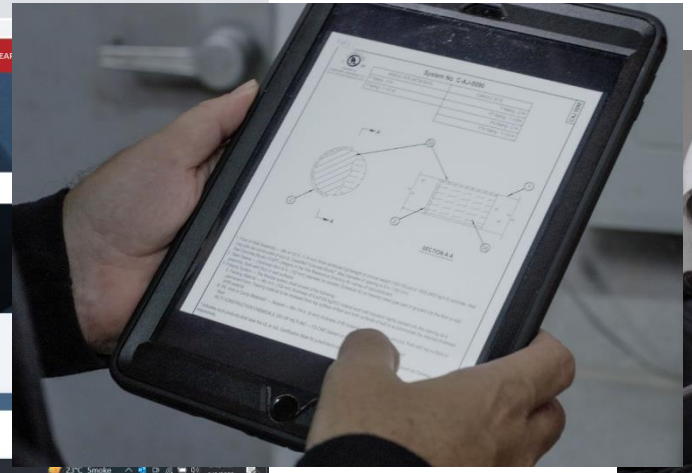


Consider Requesting Building Personnel…

Woudn't it be cool if building owners knew…

Please protect the breaches in fire-resistance with a firestop system (structural fire protection) installed in accordance with a listing and manufacturers instructions…





Mockup Review BEFORE Construction….

Heckler Photo

C. Zussman Pepper Photo

Separating Penetrating Items???

C.Zussman, Pepper Photo

7.4.3 Spacing of Openings for Penetrations Through Stud Walls

As with openings through wall plates and tracks, multiple openings through a fire separation itself can have a detrimental effect on the fire resistance rating of a stud wall unless the openings are properly spaced and protected. Listed fire stop systems for such multiple penetrations provide the minimum spacing between penetrating items. Where individual listed fire stop systems are used, best practice suggests that they be spaced sufficiently far apart so that the necessary resistance to fire spread provided by the base construction will be available. Figure 7.D provides guidance for spacing individual penetrations in stud walls with stud spacing at 610 mm O.C. Fewer openings would be permitted with studs spaced at 400 mm O.C.

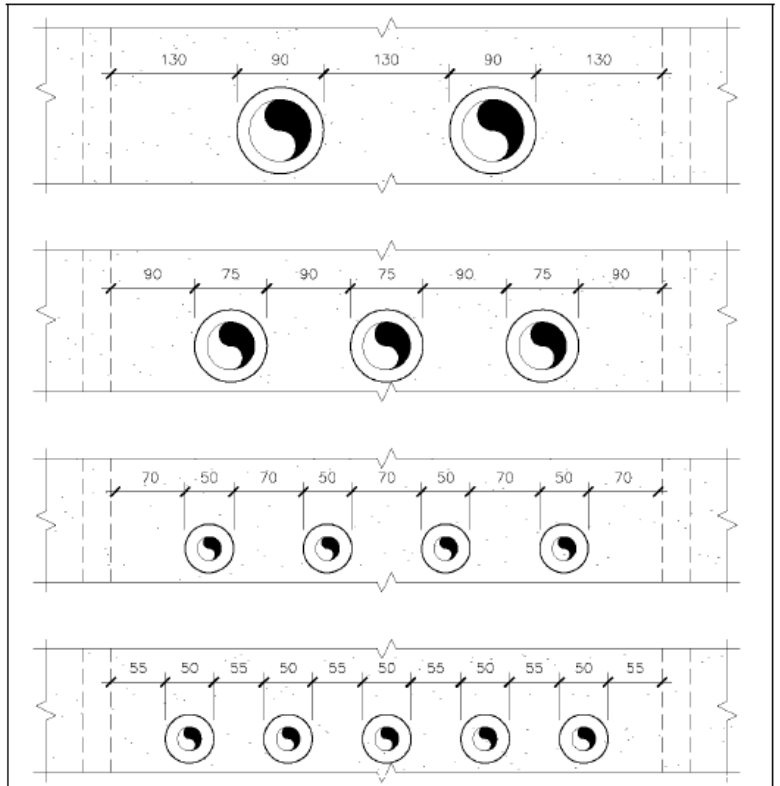


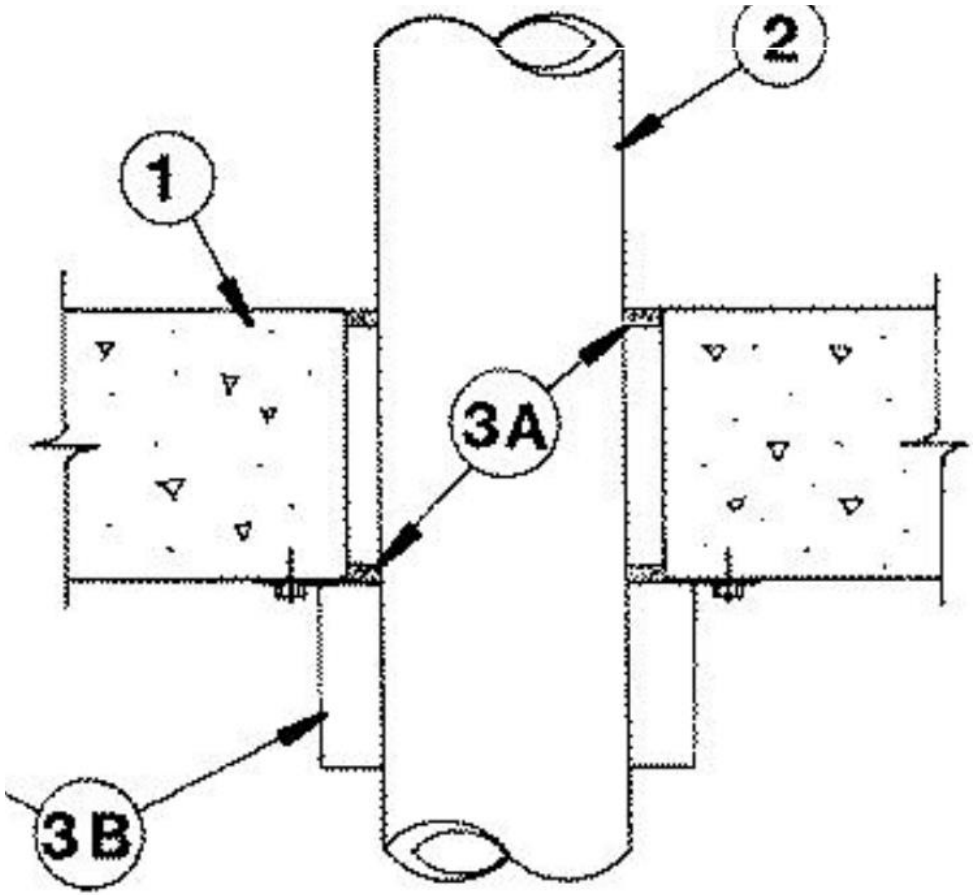
Figure 7.D:
Minimum spacing for openings for penetrations through stud walls.

NRC Best Practice Guide, 2007

What's wrong with this picture?

Heckler Photo

C-AJ-2038
https://iq.ulprospector.com/en/profile?e=173569



What's wrong with this picture?

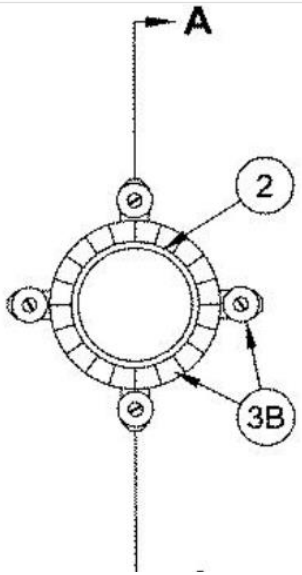
Sleeve?
Rags?
No Sealant?

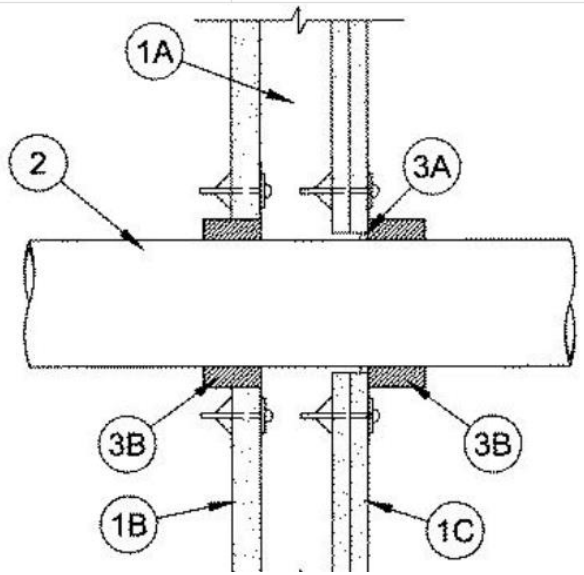
D. Falconer Photo

What's wrong with this picture?

W-L-2257
https://iq.ulprospector.com/en/profile?e=176962

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
	F Rating — 2
	FT Rating — 2
	FH Rating — 2
	FTH Rating — 2





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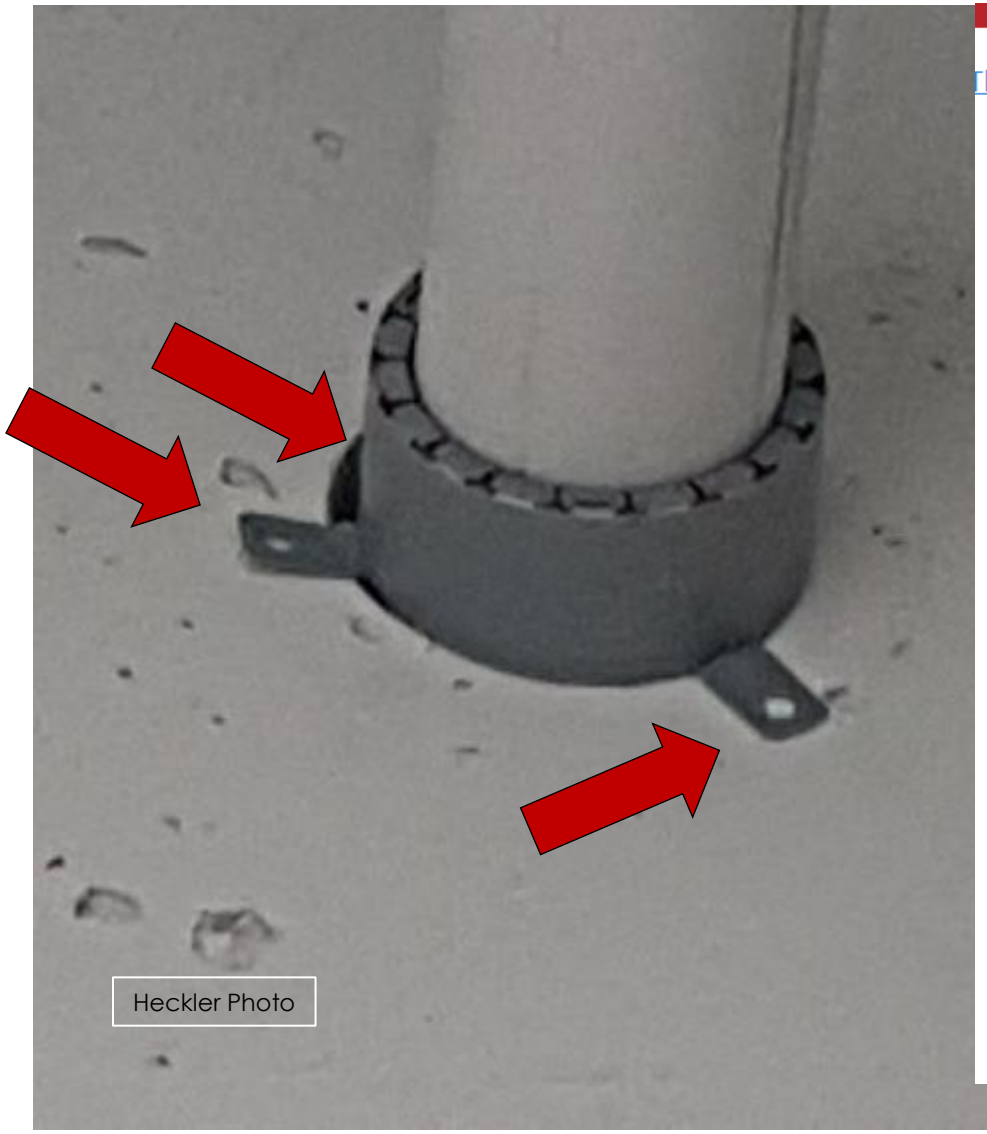


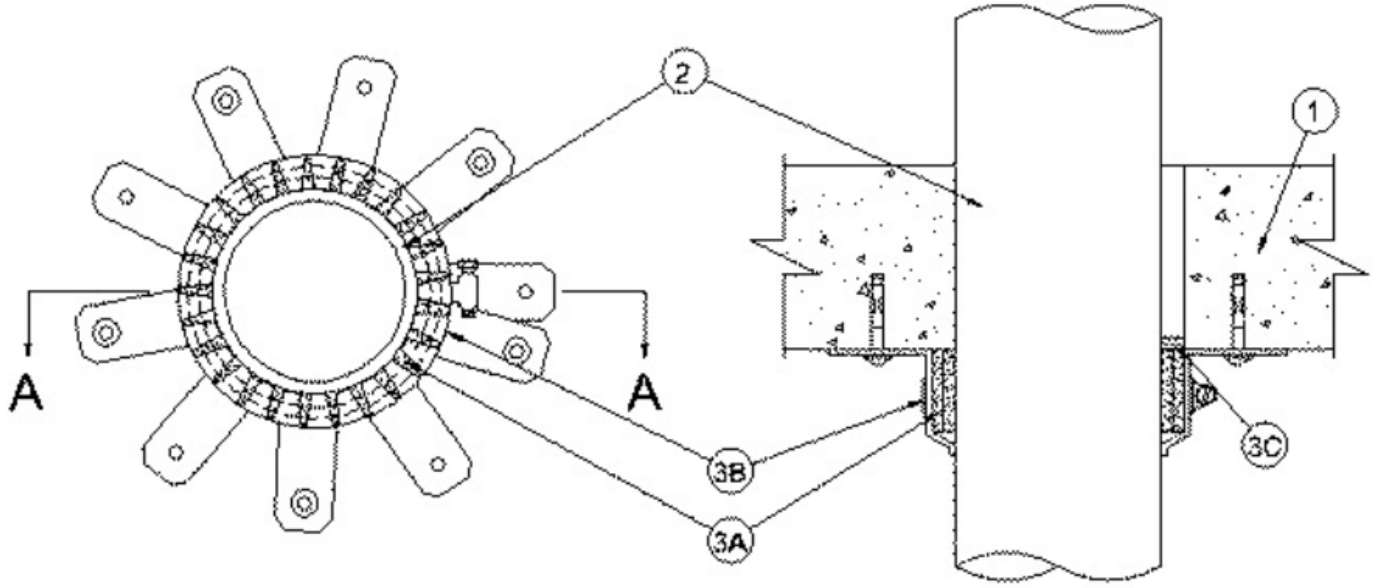
Through-penetration Firestop Systems

System No. C-AJ-2371

January 09, 2015

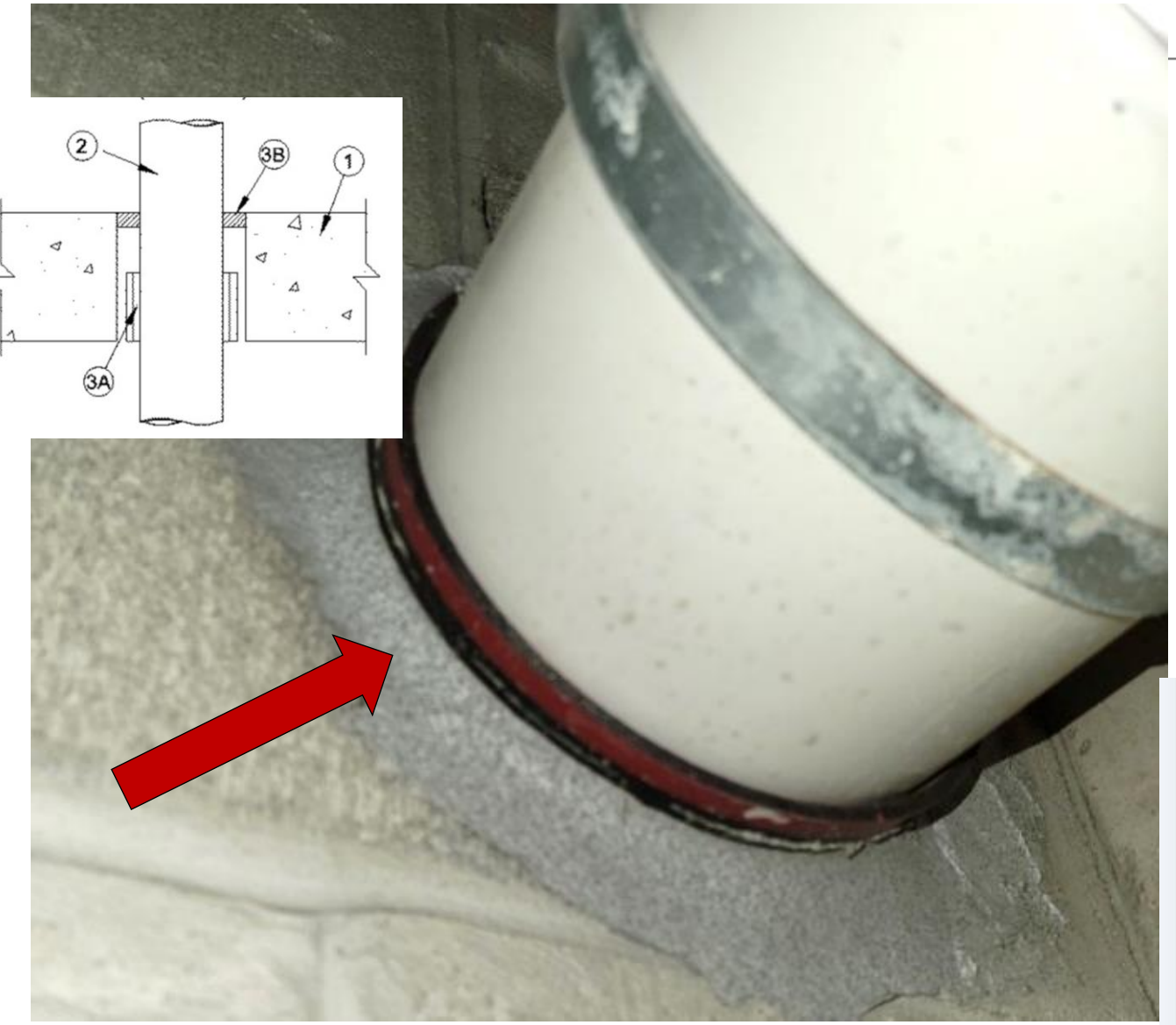
F Rating - 3 Hr

T Ratings - 2 and 3 Hr (See Item 3)



SECTION A-A

C-AJ-2048?? No



C-AJ-2048
https://iq.ulprospector.com/en/profile?e=178770

System tested with a pressure differe[illegible] of 50 Pa between the exposed and the unexposed surfaces with the higher pressure on the exposed side.

1. **Floor or Wall Assembl[illegible]** [illegible] mm (4-1/2 in.) thick reinforced lightweight or normal weight (1600-2400 kg/cu meter or 100-150 [illegible]. Max diam of opening is 152 mm (6 in.).

1A. **Stee[illegible]loor Assembly —** (Not Shown) — As an alternate to Item 1, the floor assembly may consist of a fluted steel deck concrete floor assembly. The floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:

A. **Steel Floor and Form Units* —** Min 64 mm (2-1/2 in.) deep galv fluted units.

2. **Through Penetrants —** One nonmetallic pipe or conduit centered within opening with a nom 19 mm (3/4 in.) annular space between penetrant and periphery of opening. Penetrant to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of penetrants may be used:

A. **Polyvinyl Chloride (PVC) Pipe —** Nom 102 mm (4 in.) diam (or smaller) Schedule 40 solid core or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. **FT and FTH Ratings are 1-1/4 Hr.**

B. **Fire Retardant Polypropylene (FRPP) Pipe —** Nom 102 mm (4 in.) in. diam (or smaller) Schedule 40 FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. **FT and FTH Ratings are 1/4 Hr.**

4. **Firestop System —** The firestop system shall consist of the following:

A. **Fill, Void or Cavity Materials* - Wrap Strip —** Nom 6.4 mm (1/4 in.) thick intumescent material supplied in 51 mm (2 in.) wide strips. Min two layers of wrap strip individually wrapped tightly around the nonmetallic penetrant with ends butted and held in place with masking tape. Butted ends in successive layers shall be offset. Bottom edge of wrap strip to be flush with the bottom surface of floor or with both surfaces of wall assembly. When used with the steel deck floor assembly, bottom edge of wrap strip shall be flush with the crest of the steel

4. **Firestop System —** The firestop system shall consist of the following:

A. **Fill, Void or Cavity Materials* - Wrap Strip —** Nom 6.4 mm (1/4 in.) thick intumescent material supplied in 51 mm (2 in.) wide strips. Min two layers of wrap strip individually wrapped tightly around the nonmetallic penetrant with ends butted and held in place with masking tape. Butted ends in successive layers shall be offset. Bottom edge of wrap strip to be flush with the bottom surface of floor or with both surfaces of wall assembly. When used with the steel deck floor assembly, bottom edge of wrap strip shall be flush with the crest of the steel form units.

RECTORSEAL — Biostop Wrap Strip

B. **Fill, Void or Cavity Material* — Caulk —** Min 13 mm (1/2 in.) thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall assembly.

RECTORSEAL — Biostop 500+

Feedback

C-AJ-2048?? No

F-A-2162 – NO 50pa, NOT CANADA!!!
https://iq.ulpro[illegible]ctor.com/en/profile?e=178770

System No. F-A-2162

January 27, 2009

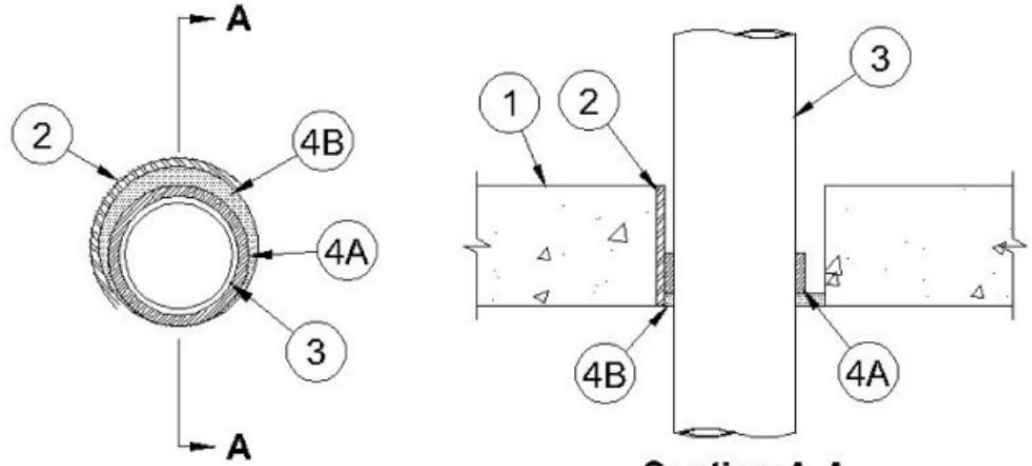
F Rating — 2 Hr

T Rating — 0 Hr

L Rating At Ambient — Less Than 1 CFM/sq ft

L Rating At 400 F — Less Than 1 CFM/sq ft

W Rating — Class 1 (See Item 4B)



Section A-A

What's wrong with this picture? NOTHING

Superl Photo

UL Product iQ® SEARCH MY SEARCHES MY TAGS BILL UL Solutions

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

See General Information for Through-penetration Firestop Systems

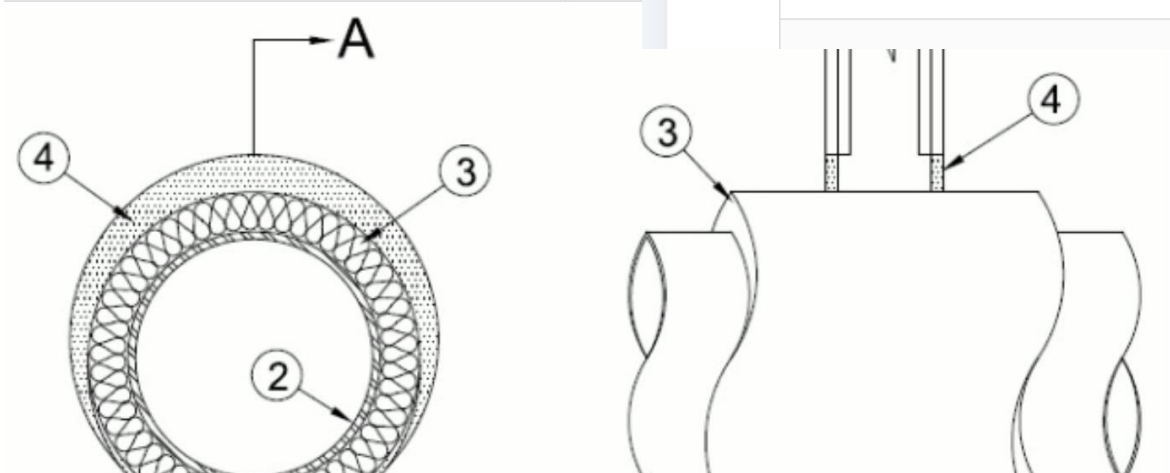
See General Information for Through-penetration Firestop Systems Certified for Canada

System No. W-L-5029

July 17, 2015

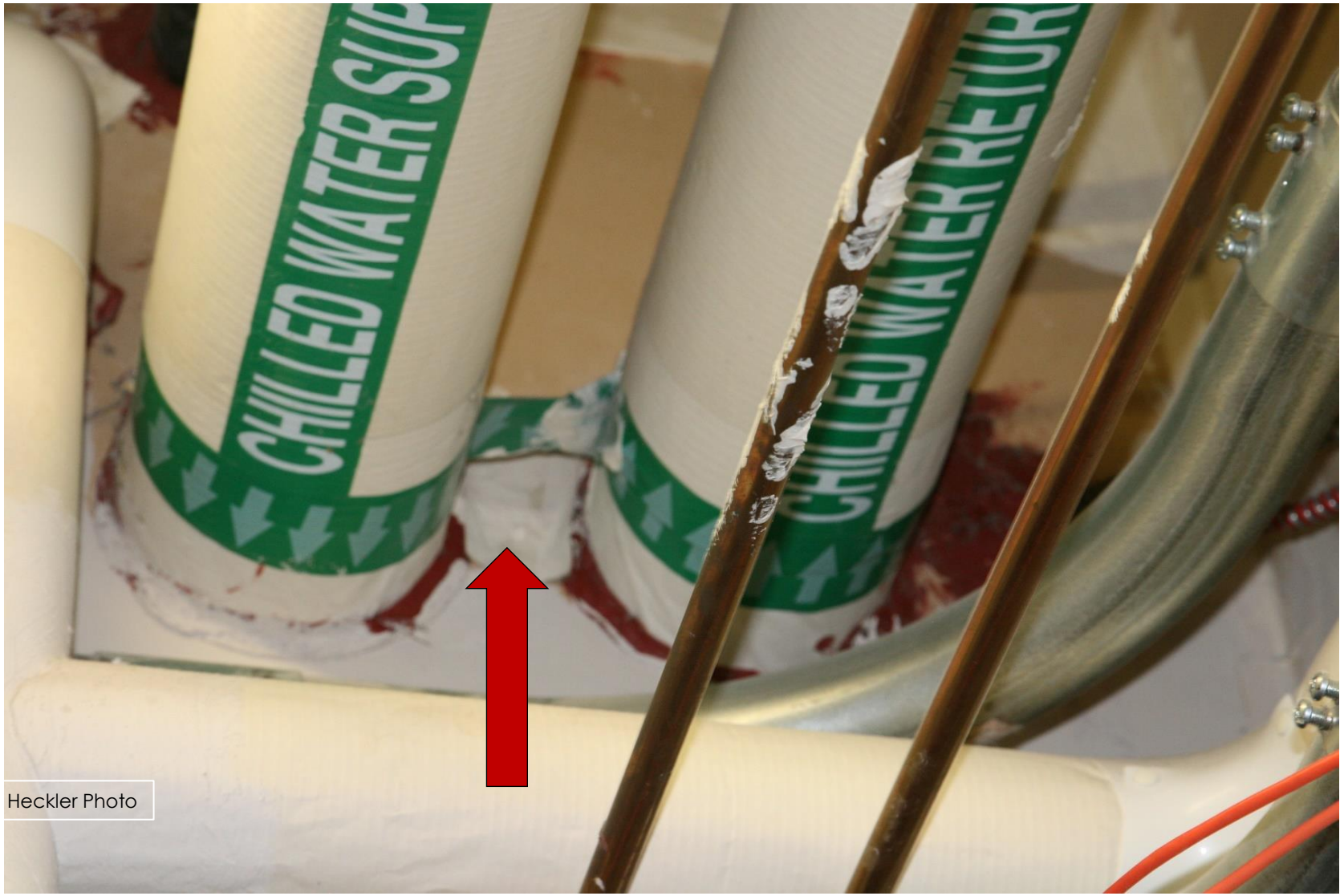
ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings — 1, 2 and 3 Hr (See Items 1, 3 and 4)	F Ratings — 1, 2 and 3 Hr (See Items 1, 3 and 4)
T Ratings — 0, 1/2, 1 and 1-1/4 Hr (See Item 3)	FT Ratings — 0, 1/2, 1 and 1-1/4 Hr (See Item 3)
L Rating At Ambient — 4 CFM/Sq Ft	FH Ratings — 1, 2 and 3 Hr (See Items 1, 2 and 4)
L Rating At 400 F — Less Than 1 CFM/Sq Ft	FTH Ratings — 0, 1/2, 1 and 1-1/4 Hr (See Item 3)
	L Rating At Ambient — 4 CFM/Sq Ft
	L Rating At 400 F — Less Than 1 CFM/Sq Ft

Feedback

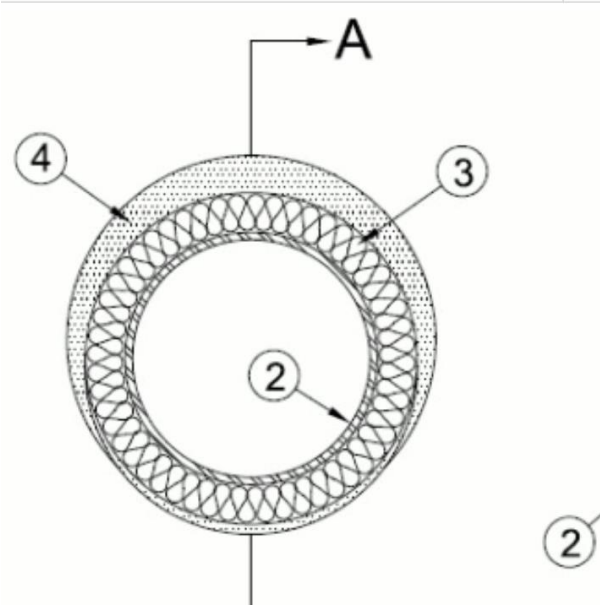


W-L-5029
https://iq.ulprospector.com/en/profile?e=177655

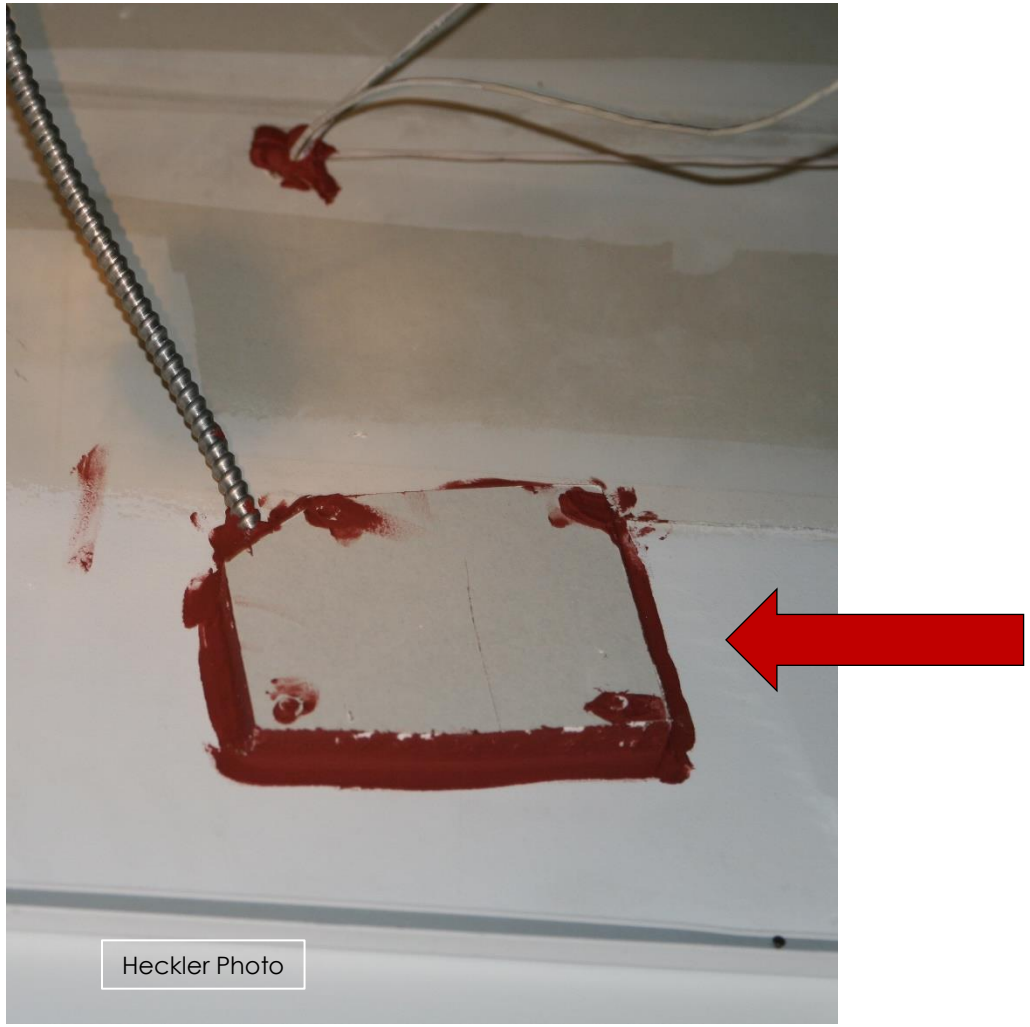
What's wrong with this picture? MIX??



Heckler Photo



What's wrong with this picture?



What's wrong with this picture?

Multiple Manufacturers

Separate Joint/Penetration

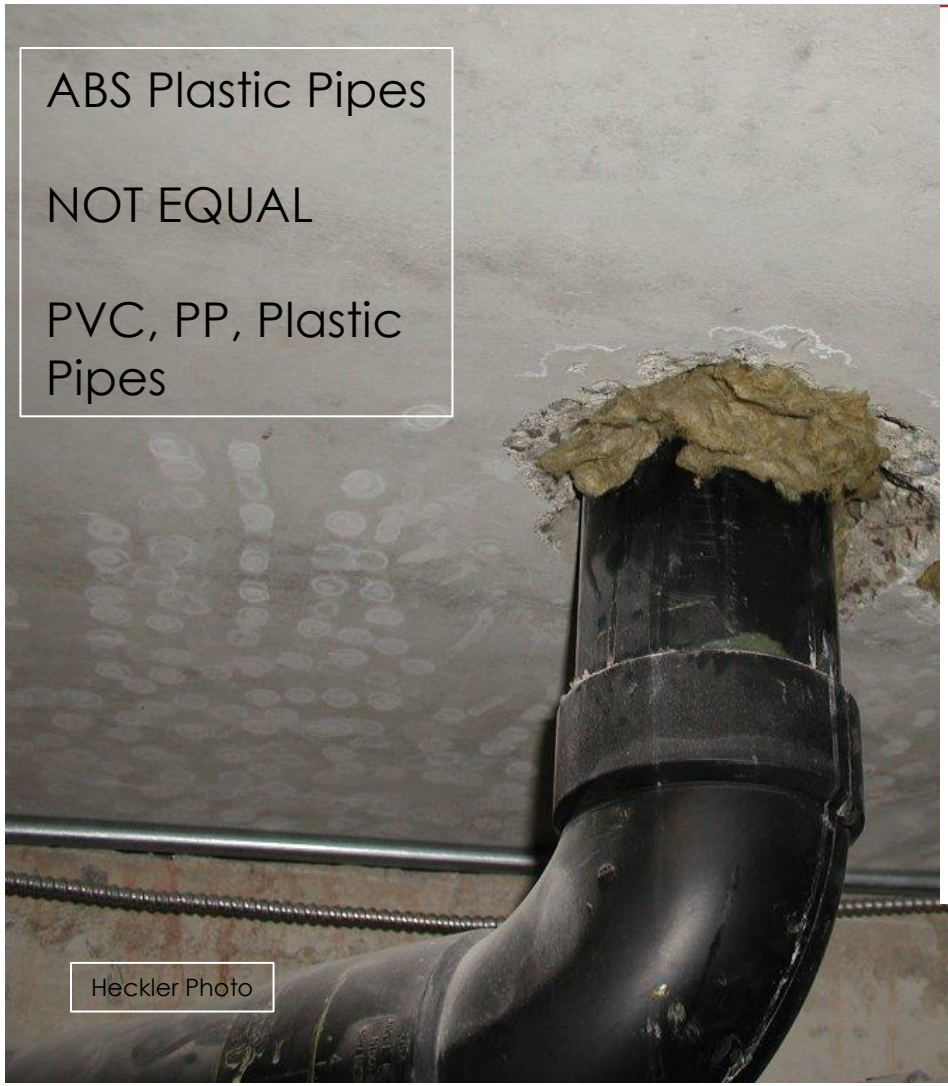
Collar on Metal Piple?

Plastic to Metal Junction?

Bags? Caulk??

Coupling?

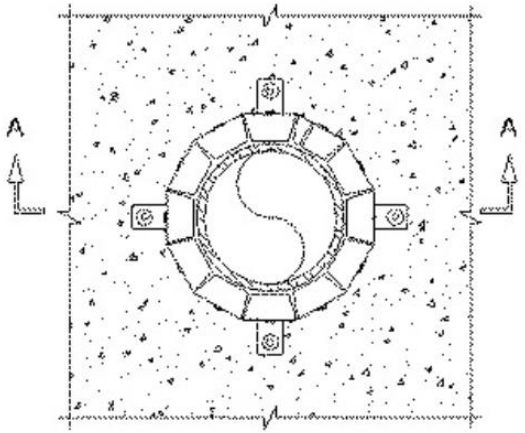
What's Wrong? COLLAR?

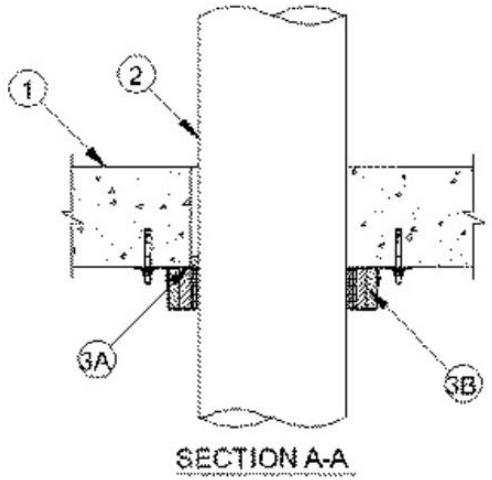


System No. C-AJ-2035

October 26, 2021

F Ratings — 2 and 3 Hr (See Items 1 and 2H)
FT Ratings — 1 and 2 Hr (See Item 1)
FH Ratings — 0 and 2 Hr (See Item 2H)
FTH Ratings — 0 and 2 Hr (See Item 2H)
L Rating at Ambient — Less Than 1 CFM/sq ft
L Rating at 400 F — Less Than 1 CFM/sq ft



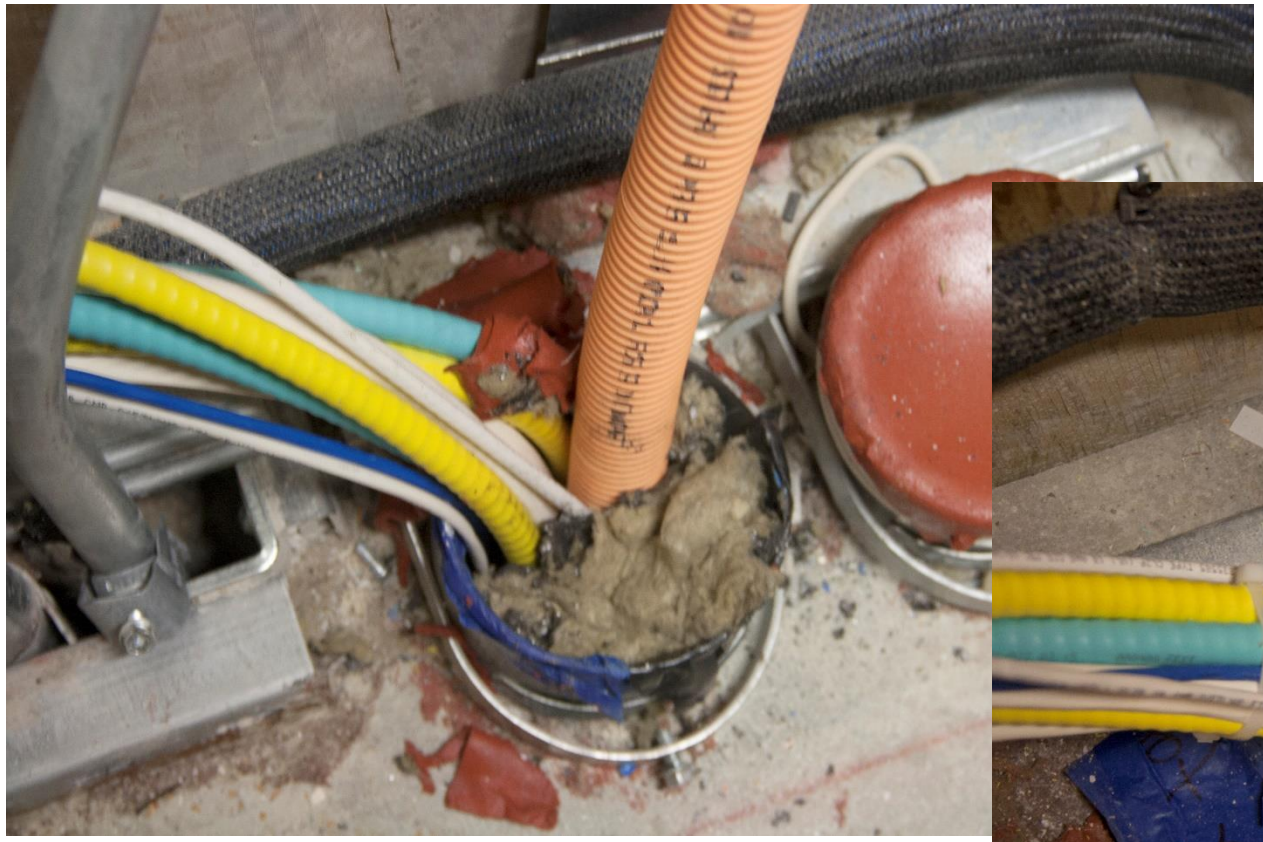


SECTION A-A

System tested with a pressure differential of 50 Pa between the exposed and the unexposed surfaces with the higher pressure on the exposed side.

C-AJ-2035
https://iq.ulprospector.com/en/profile?e=178762

What's wrong with this picture?



Listings???
Not Likely…

Heckler Photo

What's wrong with this picture?

Couplings?

No Firestop?

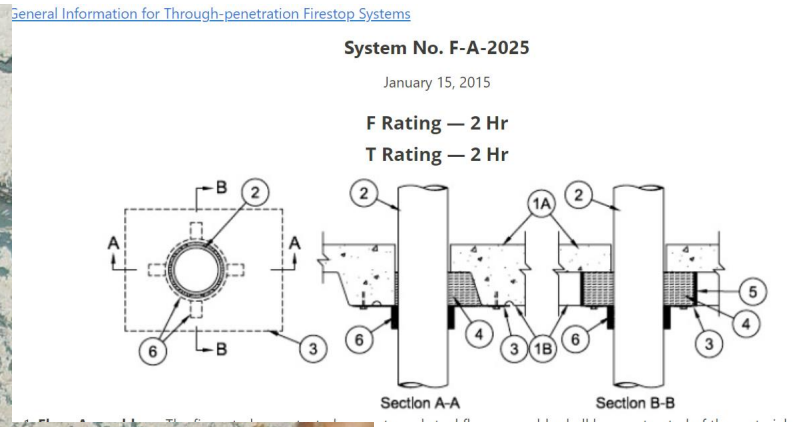
Sheet metal?

End Cap Sealants?

Spacing?

Mixing manufacturers?

Heckler Photo



Firestopping & Compartmentation
Which is Correct??

Sheet Metal?

Composite Sheet?

What's wrong with this picture? NOTHING

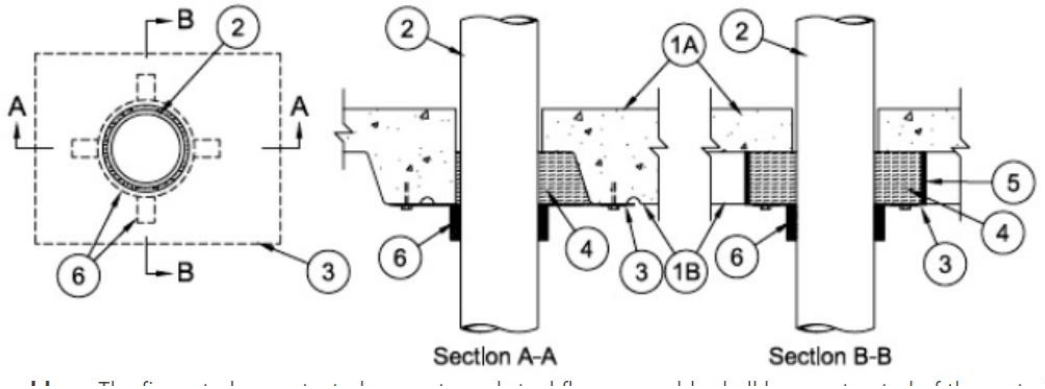
General Information for Through-penetration Firestop Systems

System No. F-A-2025

January 15, 2015

F Rating — 2 Hr

T Rating — 2 Hr



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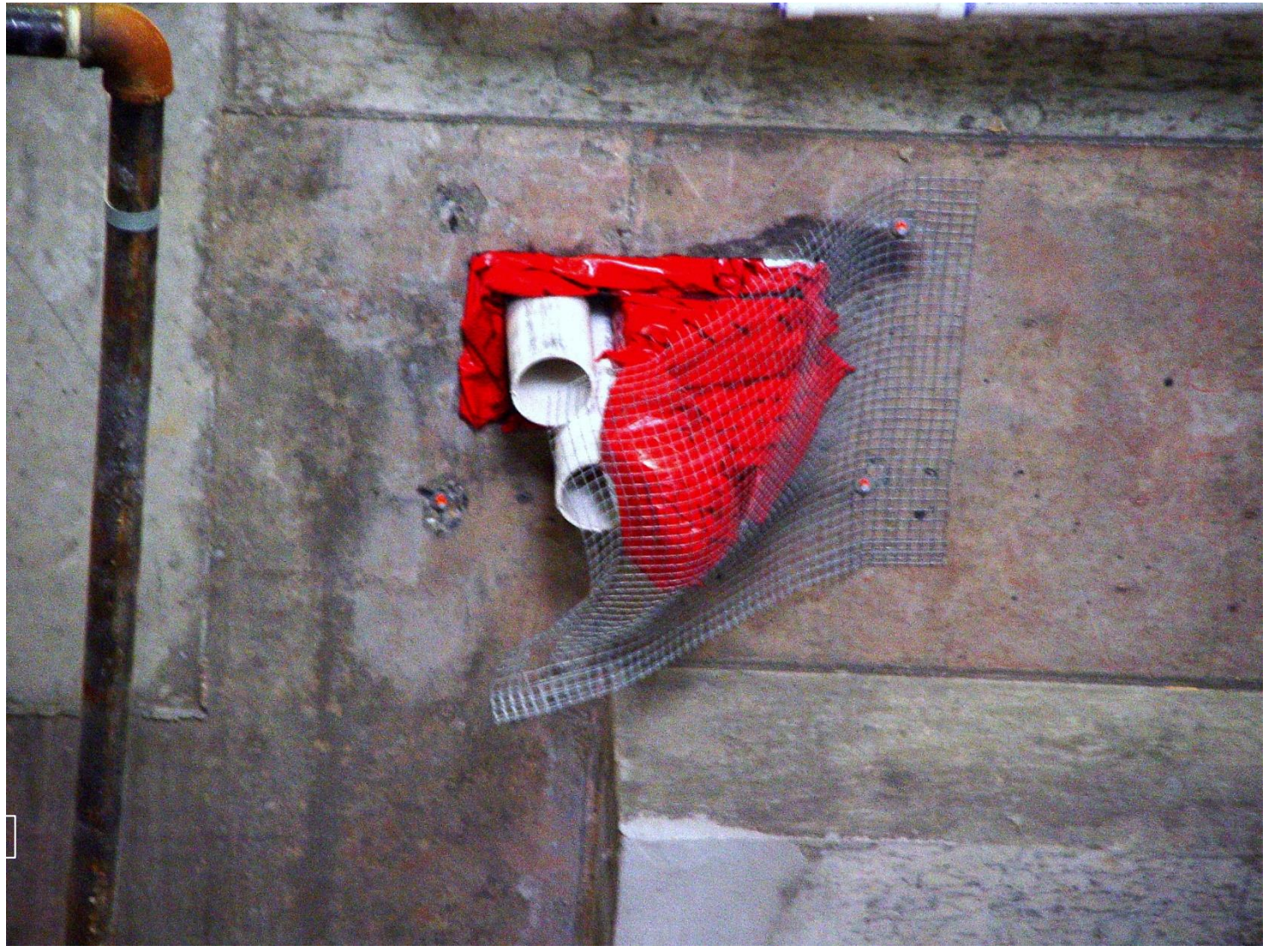
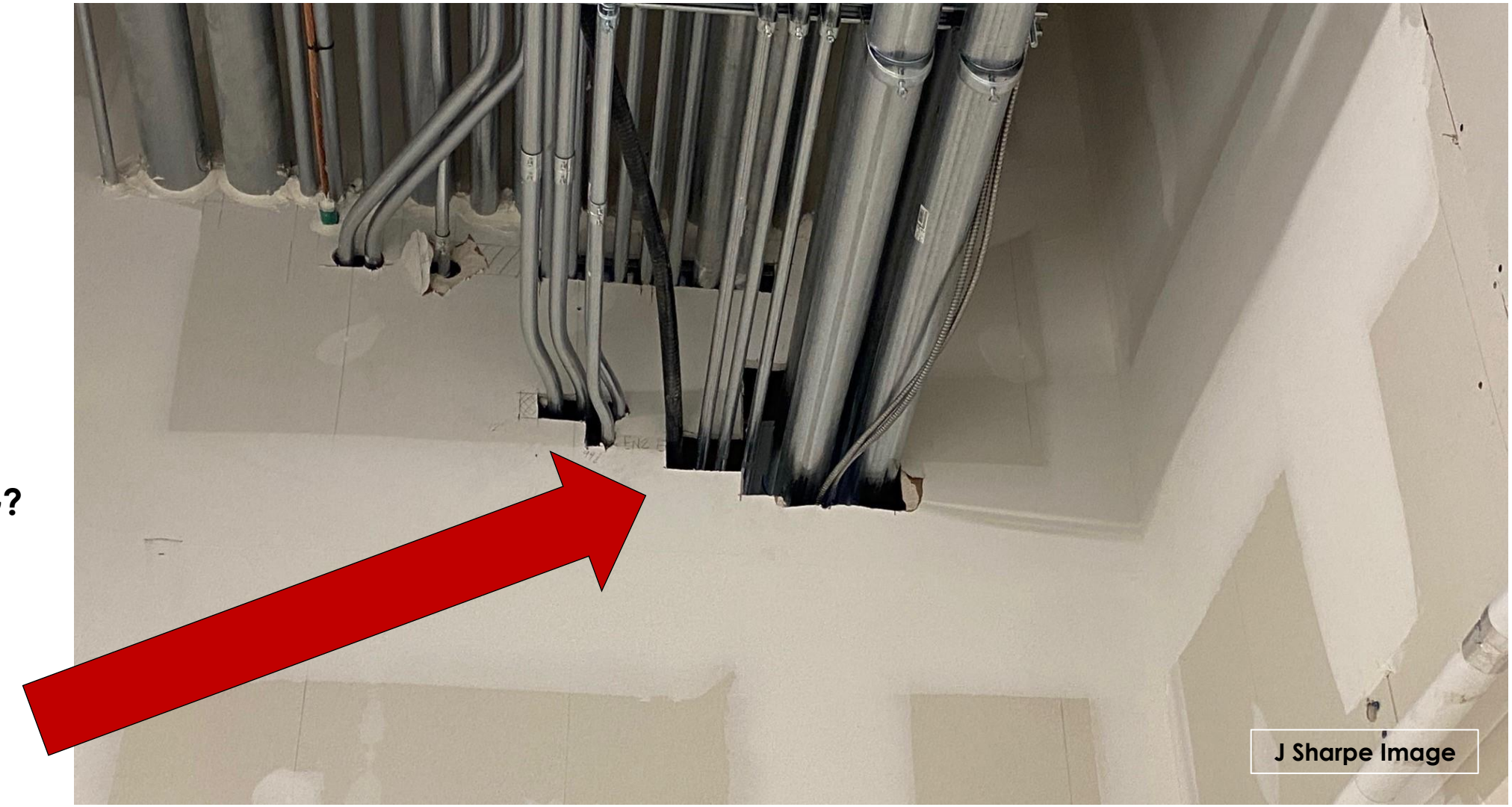


Heckler Photo

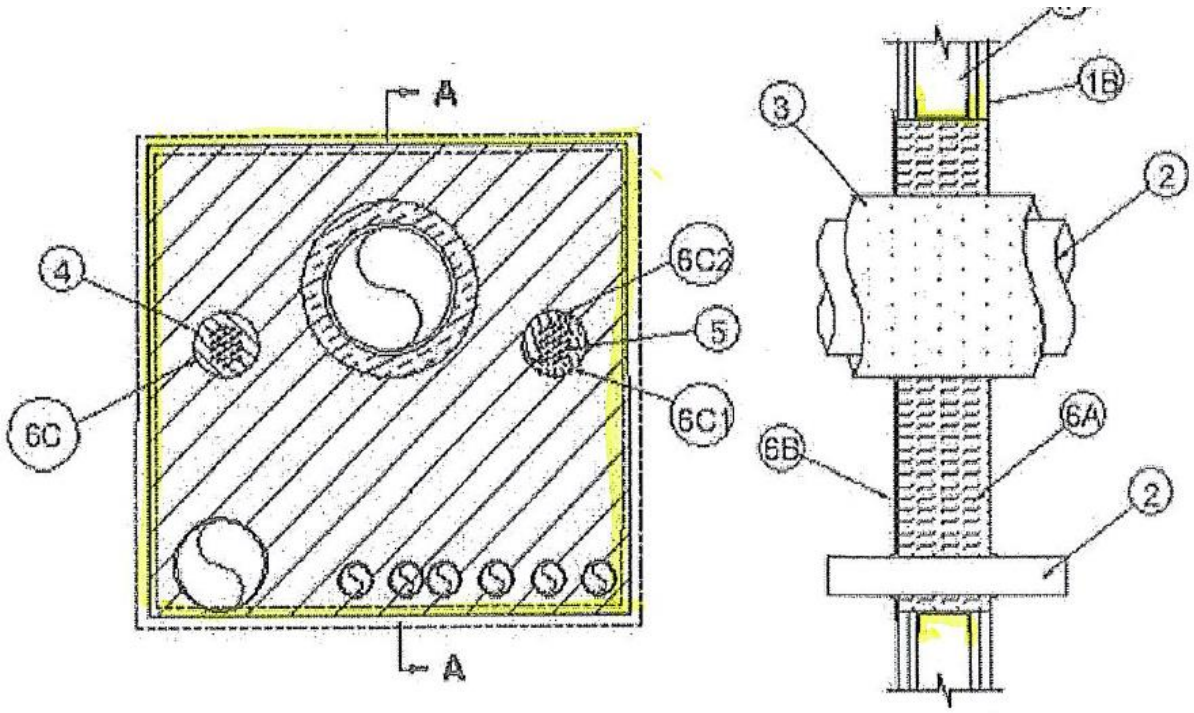
Firestop & Inspection

FRAMING?



J Sharpe Image

Firestop & Inspection



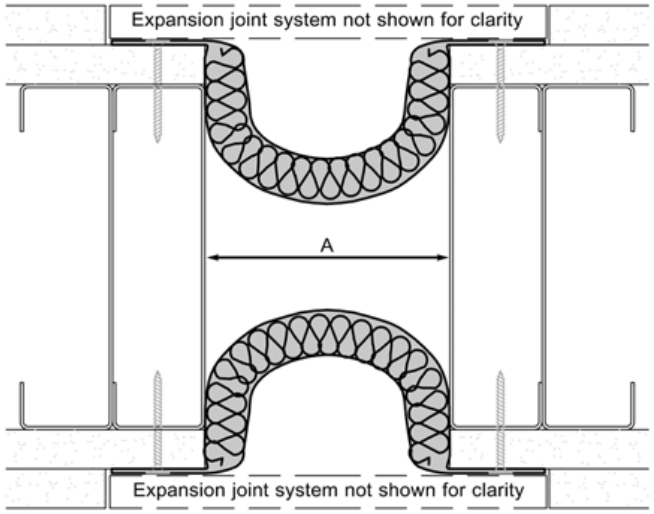
Section A-A

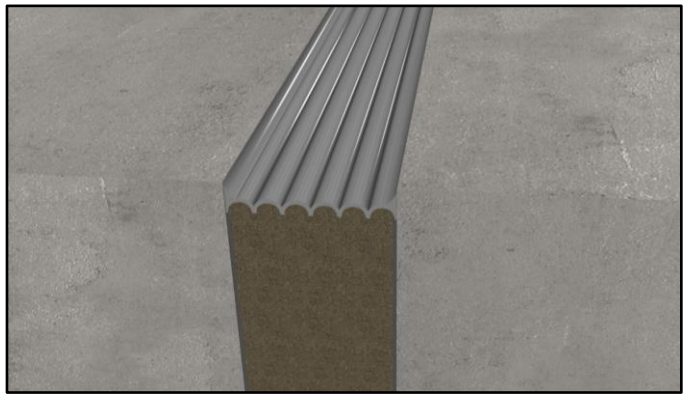
1. **Wall Assembly** — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

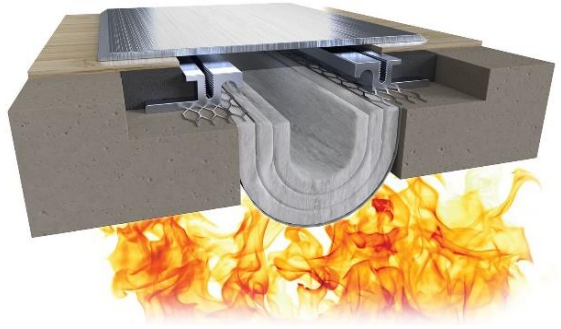
A. **Studs** — Wall framing may consist of either wood studs or channel shaped steel studs. Wood studs to consist of nom 51 by 102 mm (2 by 4 in.) lumber spaced max 406 mm (16 in.) OC. Steel studs to be min 89 mm (3-1/2 in.) wide and spaced max 610 mm (24 in.) OC. Additional framing members shall be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

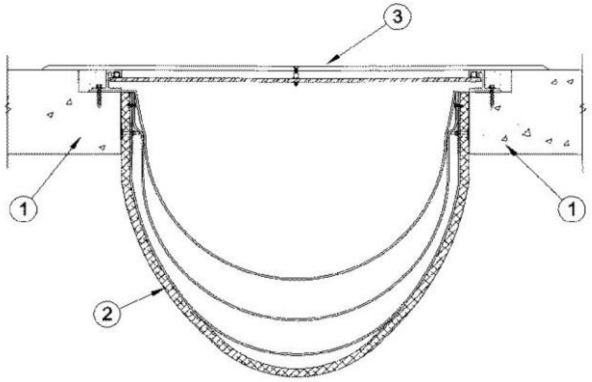
Mockup Review BEFORE Construction….

Firestop & Inspection - Fire Rated Expansion Joints = FF-D-4001, -1201, -1204…more









Balco, Construction Specialties, Inpro, MM Systems, UL Solutions

Firestop - FF-D-4001

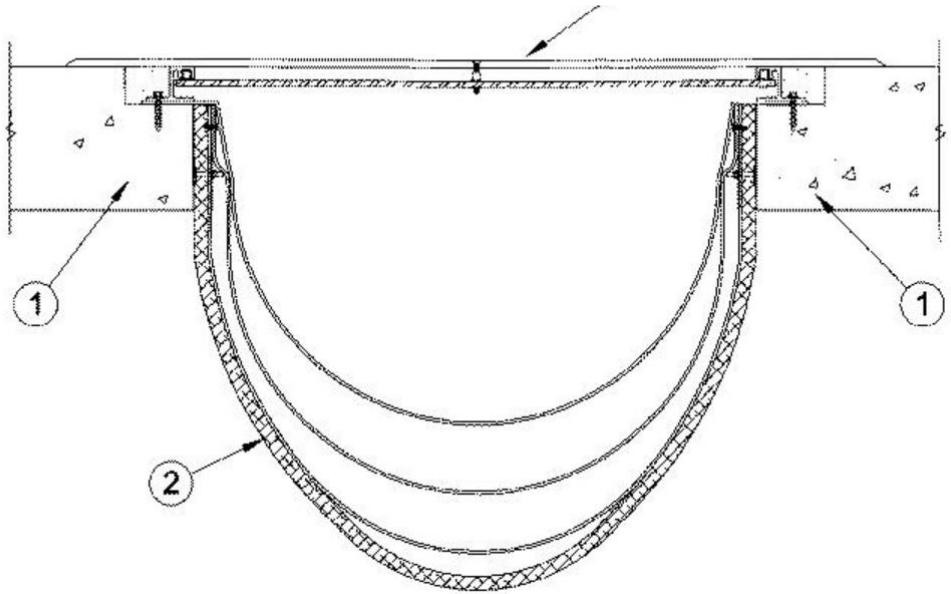
System No. FF-D-4001

September 20, 2000

Assembly Rating — 2 Hr

Nominal Joint Width — 25 to 36 in.

Class II and III Movement Capabilities — 50% Compression or Extension



1. **Floor Assembly —** Reinforced lightweight or normal weight (100-150 pcf) structural concrete having a min thickness of 4-1/2 in. at stepped-edges receiving joint cover (Item 3).

2. **Mechanical Joint Assembly* — Nom width of joint is 25 to 36 in.** Flexible multilayer mat material with galv steel mounting angles on longitudinal edges. The mechanical joint assembly shall be installed in accordance with the installation instructions accompanying the units.

CONSTRUCTION SPECIALTIES INC — FB97-25F-++ through FB97-36F-++ (++=max width of joint opening)

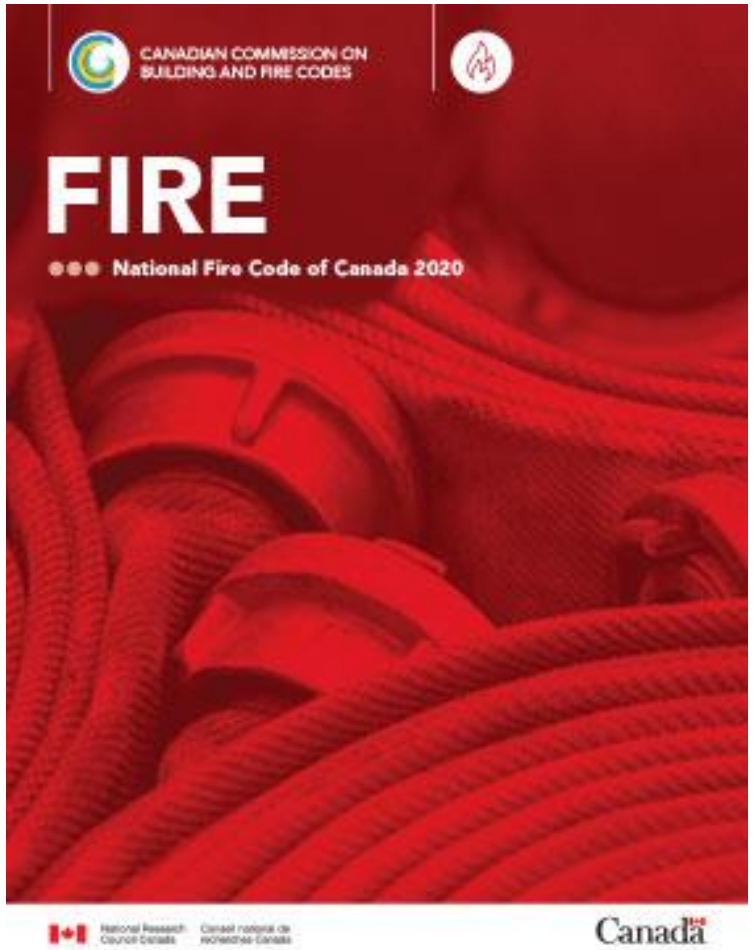
3. **Joint Cover —** Min 0.030 in. thick joint cover formed of aluminum, bronze, stainless steel or galv steel. Joint covers anchored to floor slabs on each side of joint opening, continuous over entire length of joint, in accordance with the manufacturer's installation instructions.
As an alternate, where the linear joint opening is enclosed within a chase wall and is non load bearing, a cover consisting of a creased sheet of min 2 mil stainless steel foil secured with 1 in. wide continuous galv steel washer strips along each side of the joint opening may be used.

National Fire Code of Canada – Fire Separations

- ***Division B – Part 2, Building and Occupant Fire Safety***

  2.2.1.2(1) – Damage to Fire Separations & Fire Protection Materials

Where *fire separations* are damaged so as to affect their integrity, they shall be repaired so that the integrity of the *fire separation* is maintained.

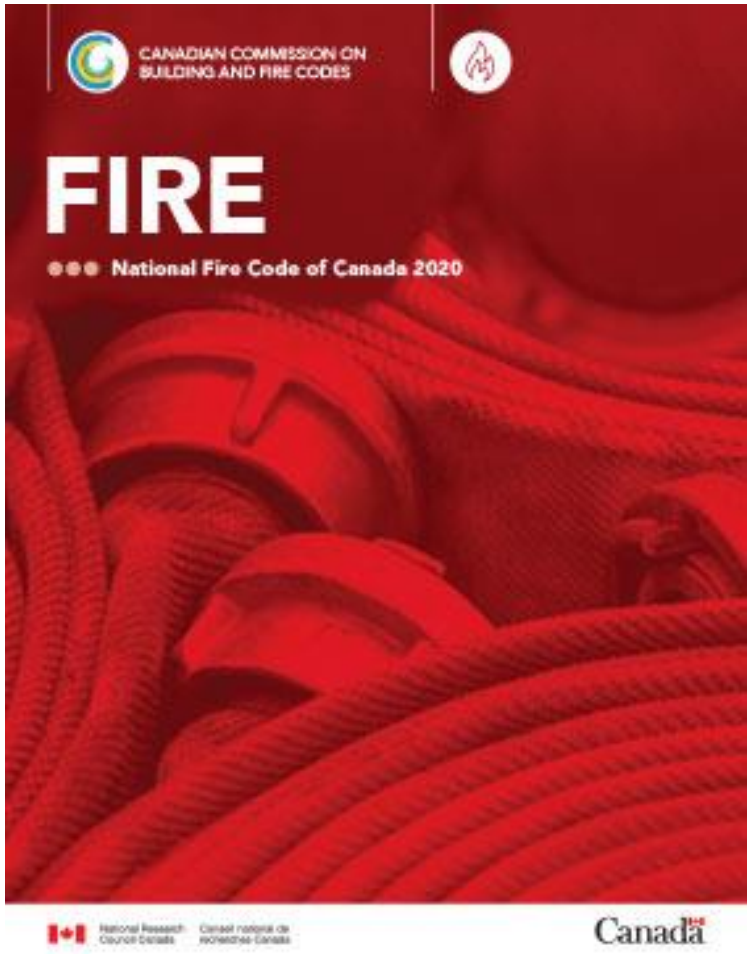


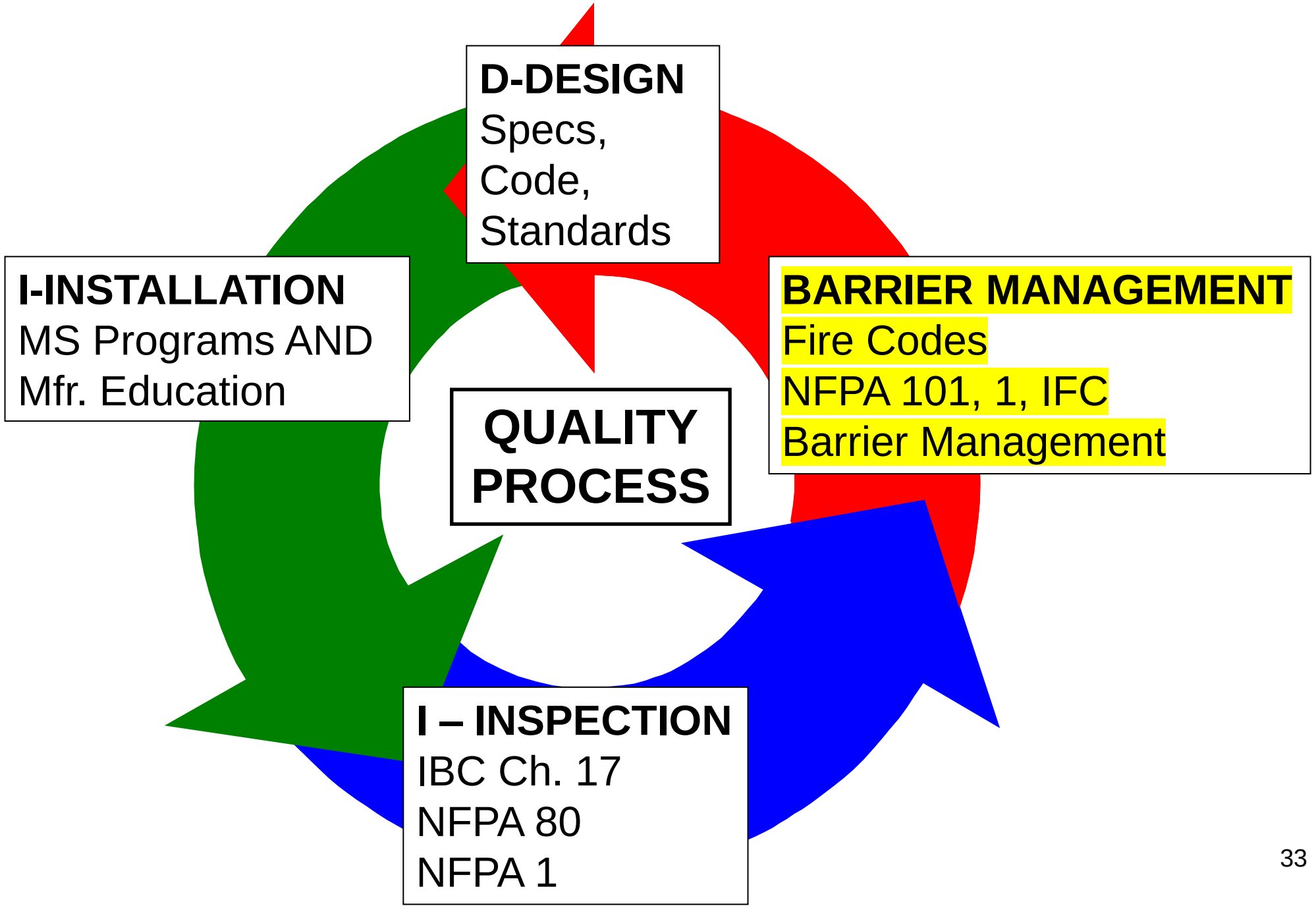
National Fire Code of Canada - Fireproofing

- ***Division B – Part 2, Building and Occupant Fire Safety***

  2.2.1.2 (2) – Damage to Fire Separations & Fire Protection Materials

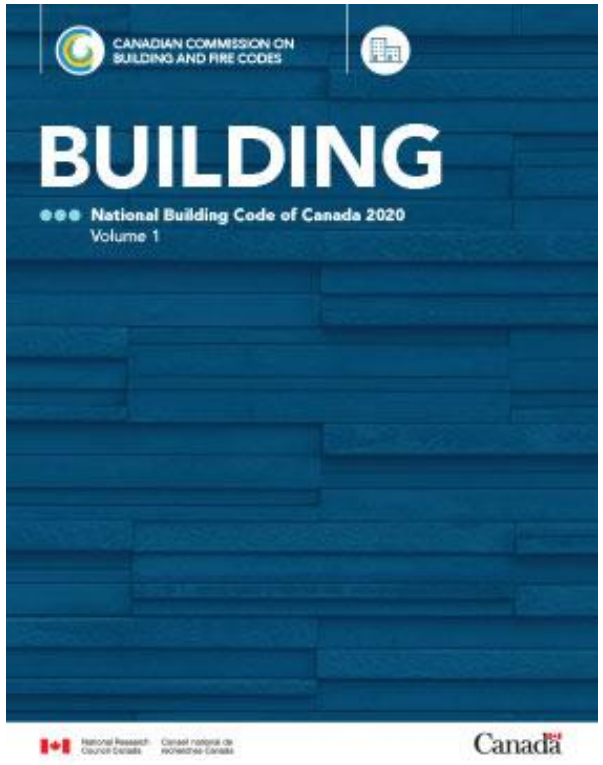
Where **materials used to provide fire protection** are damaged or removed, they shall be repaired or replaced so that the integrity of the fire protection is maintained.

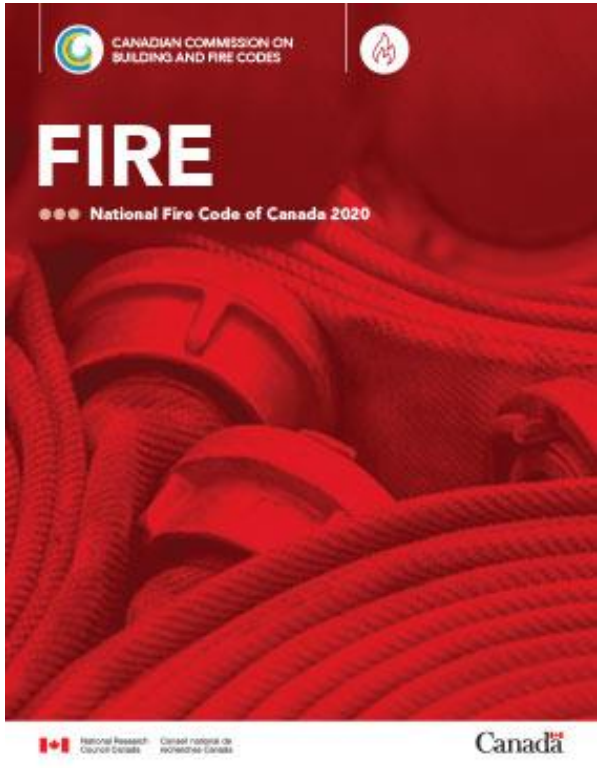



D-DESIGN
Specs,
Code,
Standards
I-INSTALLATION
MS Programs AND
Mfr. Education
BARRIER MANAGEMENT
Fire Codes
NFPA 101, 1, IFC
Barrier Management
QUALITY
PROCESS
I – INSPECTION
IBC Ch. 17
NFPA 80
NFPA 1

Building & Fire Code Requirements

- National Building Code of Canada
- National Fire Code of Canada





National Fire Code of Canada

Division A, Compliance, Objectives and Functional Statements

OS1 Fire Safety

An objective of this Code is to limit the probability that, as a result of

(a) activities related to the construction, use or demolition of the *building* or facility,

(b) the condition of specific elements of the *building* or facility,

(c) the design or construction of specific elements of the facility related to certain hazards, or

(d) inadequate built-in protection measures for the current or intended use of the *building*, a person in or adjacent to the *building* or facility will be exposed to an unacceptable risk of injury due to fire. The risks of injury due to fire addressed in this Code are those caused by—

National Fire Code of Canada

Division A, Compliance, Objectives and Functional Statements

- OS1.1 – **fire or explosion** occurring
- OS1.2 – fire or explosion **impacting areas beyond its point of origin**
- OS1.3 – **collapse of physical elements** due to a fire or explosion
- OS1.4 – **fire safety systems** failing to function as expected
- OS1.5 – persons being delayed in or impeded from moving to a safe place during a fire emergency

National Fire Code of Canada

Division A, Compliance, Objectives and Functional Statements

- **F31** To minimize the risk of injury to persons as a result of **contact with hot surfaces** or substances.
- **F34** To **resist or discourage unwanted access or entry.**
- **F40** To **limit the level of contaminants**.
- **F44 To limit the spread of hazardous substances beyond their point of release**.
- **F80 To resist deterioration resulting from expected service conditions**.
- **F82 To minimize the risk of inadequate performance due to improper maintenance or lack of maintenance.**

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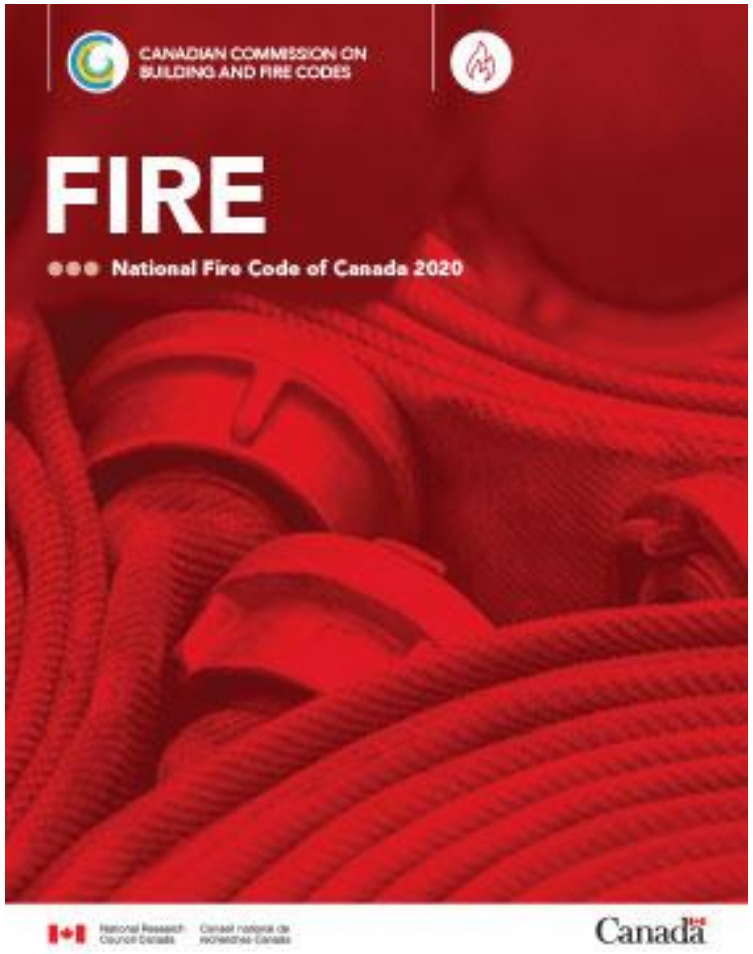
Division B, Part 2 - Building and Occupant Fire Safety

2.1. General



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Division B, Part 2 - Building and Occupant Fire Safety

2.2.2.4. Inspection and Maintenance

1) Defects that interfere with the operation of closures in fire separations shall be corrected, and such closures shall be maintained to ensure that they are operable at all times by

a) keeping fusible links and other heat-actuated devices undamaged and free of paint and dirt,

b) keeping guides, bearings and stay rolls clean and lubricated,

c) making necessary adjustments and repairs to door hardware and accessories to ensure proper closing and latching, and

d) repairing or replacing inoperative parts of hold-open devices and automatic releasing devices.

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Division B, Part 2 - Building and Occupant Fire Safety

3) Doors in fire separations shall be operated at intervals not greater than one month to ensure that they are properly maintained in accordance with Sentence (1), ….

…. as specified in the fire safety plan prepared in conformance with Section 2.8.

4) Closures in fire separations shall not be obstructed, blocked, wedged open, or altered in any way that would prevent the intended operation of the closure.

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Division B, Part 2 - Building and Occupant Fire Safety

5) Fire dampers, smoke dampers, combination smoke/fire dampers and fire stop flaps shall be….

a) inspected at intervals not greater than 12 months to ensure that they are in place and not obviously damaged or obstructed, and

b) tested in accordance with NFPA 80, “Fire Doors and Other Opening Protectives.”

National Fire Code of Canada

Division B, Part 2 - Building and Occupant Fire Safety

2.8.2.1. Measures in a Fire Safety Plan

1) In buildings or areas described in Article 2.8.1.1., a fire safety plan conforming to this Section shall be prepared in cooperation with the fire department and other applicable regulatory authorities and shall include

a) the emergency procedures to be used in case of fire, including

i) sounding the fire alarm (see Note A-2.8.2.1.(1)(a)(i)),

ii) notifying the fire department,

iii) instructing occupants on procedures to be followed when the fire alarm sounds,

iv) evacuating occupants, including special provisions for persons requiring assistance (see Note A-2.8.2.1.(1)(a)(iv)),

v) confining, controlling and extinguishing the fire,

National Fire Code of Canada

Division B, Part 2 - Building and Occupant Fire Safety

2.8.2.1. & 2.8.2.2. Measures in a Fire Safety Plan

b) the appointment and organization of designated supervisory staff to carry out fire safety duties,

c) the training of supervisory staff and other occupants in their responsibilities for fire safety,

d) documents, including diagrams, showing the type, location and operation of the building fire emergency systems,

e) the holding of fire drills,

f) the control of fire hazards in the building, and

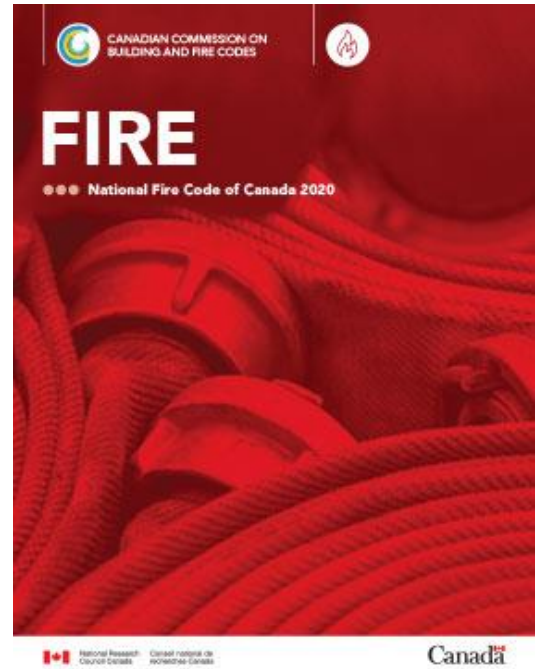
g) the inspection and maintenance of building facilities provided for the safety

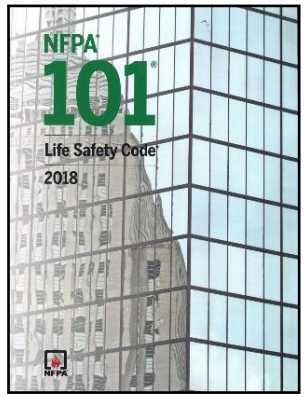
of occupants. (See Note A-2.8.2.1.(1).)

2) **The fire safety plan shall be reviewed at intervals not greater than 12 months** to ensure that it takes account of changes in the use and other characteristics of the building.

Fire Codes Require Maintenance

- **National Fire Code of Canada**
  - Maintain Protection, PERIOD…
  - Fire Safety Plan – 12 month review
- **NFPA 101**
  - No Frequency
- **NFPA 1**
  - Inspection 3 Years High Rise
- **International Fire Code**
  - Annual Visual Inspection





National Fire Protection Association
NFPA 1 – 2018

- **12.3.3* Maintenance of Fire-Resistive Construction, Draft-Stop Partitions, and Roof Coverings.**
  - **12.3.3.1** Required fire-resistive construction, including fire barriers, fire walls, exterior walls due to location on property, fire-resistive requirements based on type of construction, draftstop partitions, and roof coverings, *shall be maintained and shall be properly repaired, restored, or replaced where damaged, altered, breached, penetrated, removed, or improperly installed.*

FCIA Added Emphasis

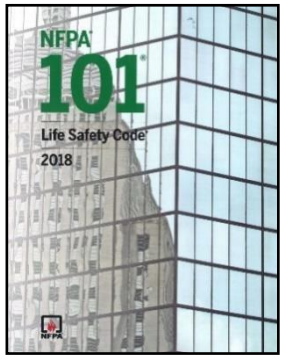
National Fire Protection Association
NFPA 1 – 2018

- **12.3.3.3.1** The **person responsible** for conducting the visual inspection shall demonstrate appropriate **technical knowledge and experience in fire-resistance-rated design and construction** acceptable to the AHJ.
- **12.3.3.3.2** A written report prepared by the person responsible for conducting the visual inspection shall be submitted to the AHJ documenting the results of the visual inspection.

FCIA Added Emphasis

National Fire Protection Association
NFPA 101 – 2018

- **SECTION 4.6.12 Maintenance, Inspection, and Testing.**
  - **4.6.12.1** **Whenever or wherever any device**, equipment, system, condition, arrangement, level of protection, fire-resistive construction, or any other feature **is required for compliance** with the provisions of this Code, **such device**, equipment, system, condition, arrangement, level of protection, fire-resistive construction, or other feature ***shall thereafter be continuously maintained*** … in accordance with applicable NFPA requirements or requirements developed as part of a performance-based design, or as directed by the AHJ.



2018 International Fire Code Maintenance

SECTION 701
GENERAL

- **701.1 Scope.** The provisions of this chapter shall govern the **inspection and maintenance** of the materials, systems and assemblies used for **structural *fire-resistance***, ***fire-resistance-rated* construction separation of adjacent spaces and construction** installed to resist the passage of smoke to safeguard against the spread of fire and smoke within a building and the spread of fire to or from buildings. New buildings shall comply

  with the *IBC*.

FCIA Added Emphasis

2018 International Fire Code Maintenance

SECTION 701
GENERAL

- **701.6 Owner's responsibility.** The **owner shall maintain an inventory** of all required fire-resistance-rated construction, construction installed to resist the passage of smoke and the construction included in Sections 703 through 707. **Such construction shall be visually inspected by the *owner* annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated.**

- **FCIA Initiative with Koffel Assoc. – 'Inventory'…**

FCIA Added Emphasis

2018 International Fire Code Maintenance

SECTION 701
GENERAL

- **701.6 Owner's responsibility Cont. Records of inspections and repairs shall be maintained.** Where concealed, such elements shall not be required to be visually inspected by the *owner* unless the concealed space is accessible by the removal or movement of a panel, access door, ceiling tile or similar movable entry to the space.

FCIA Added Emphasis

2018 International Fire Code Maintenance

SECTION 703
PENETRATIONS

- **703.1 Maintaining protection. Materials and firestop systems used to protect membrane and through penetrations** in *fire-resistance-rated* construction and construction installed to resist the passage of smoke shall be maintained.

FCIA Added Emphasis

2018 International Fire Code Maintenance

SECTION 703
PENETRATIONS

- **703.1 Maintaining protection cont.** The materials and firestop systems shall be **securely attached to or bonded to the construction being penetrated with no openings visible** through or into the cavity of the construction. Where the system design number is known, the system shall be inspected to the listing criteria and manufacturer's installation instructions.

- **FCIA Initiative…"Where the system design number is known"…**

FCIA Added Emphasis

2018 International Fire Code Maintenance

SECTION 704
JOINTS AND VOIDS

- **704.1 Maintaining protection.** Where required when the building was originally constructed, materials and systems used to protect joints and voids in the following locations shall be maintained. The materials and systems shall be securely attached to or bonded to the adjacent construction, without openings visible through the construction.

FCIA Added Emphasis

2018 International Fire Code Maintenance

SECTION 704
JOINTS AND VOIDS

- **704.1 Maintaining protection cont.**
  - Subparagraphs 1 through 7 detail the types of joints and voids required to be maintained. This list corresponds to joints and voids which are required to be protected by the 2018 IBC.
- Unprotected joints and voids do not need to be protected where such joints and voids were not required to be protected when the building was originally constructed.

FCIA Added Emphasis

Where is Firestopping & Fire-Resistance Needed Most to Protect??

- Hospitals, nursing homes
- Apartments, Condos
- Universities
- Warehousing
- Manufacturing – Paper, others
- More …..

Is Passive Fire Protection Maintained?

- Fire Separations Fire-Resistance Rated Walls/Floors
  - Penetrations & Joints
  - Fire Doors
  - Fire/Smoke Dampers
  - Fire-Rated Glazing
  - SFRM, IFRM, Boards & Wraps?
- In-House Staff?
- Outside Contractor?

Building Owner Policy Topics

- **Create a Budget to Meet Code Requirements**
- **Inventory – What Info?**
- **Implement Fire Resistance – Fire Separation Management**
  - In House Policy
  - Outside Contractor Policy
- **Monitor Process**
- **Annual Visual Inspection & Keep Records**
- **Make Repairs – Keep Records**
- **Show Fire Marshal….Insurance Company**
- **Apply for Discount Credits**

Building Owner Fire-Resistance Inventory

- **Life Safety Drawings**
- Designs, Systems and Assemblies – **Listings**
- **Manufacturers Installation and Maintenance Instructions**
- How?
  - Paper & Files
  - Spreadsheets
  - Software

Fire Separation / Fire Wall Survey

- **Visual Building Survey/Inspection….**
  - **Does the Firestop/Fire-Resistive Joint look like the assembly?**
    - Annular Space
    - Visible Breaches, unless listing allows
    - Joint Width
    - Penetrating Item Types, Coverings, #Quantity
    - Penetrations in Joints & Not in System/Listing…
    - Much more…
  - **Competent Personnel**

Firestop (& Other Fire-Resistance Repairs)

- Repairs
  - Instruction requirements by manufacturer
  - TESTED AND LISTED SYSTEMS
  - Patching
    - Systems….Ratings
    - Adhesion
    - Movement
    - T, L, W Ratings
    - ***As recommended by MFR, Liisting***

Affinity Firestop Photo

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