FIRESTOP LIFE SAFETY SEMINAR

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www.us.hilti.com/firestops

www.constructionplatform.hilti.com

HILTI – A GLOBAL PRESENCE

- **Located in over 120 countries on 6 continents**
- **Over 29,000 employees**
- **Research and Developer, Manufacturer, Direct Marketing and Sales**

HILTI - NORTH AMERICA

- **Over 4,000 employees**
- **1,800 account managers**
- **Over 200 customer service representatives**
- **250 Firestop Protection Specialists and Field Engineers**
- **100+ Hilti Stores**
- **Extensive repair center network**

AGENDA

Consequences of Fires

What is Firestop?

Fire Incident Examples

Fire Safe Building Construction & Code Requirements

Firestop System Testing

Selecting Firestop Systems

Firestop Installation Examples

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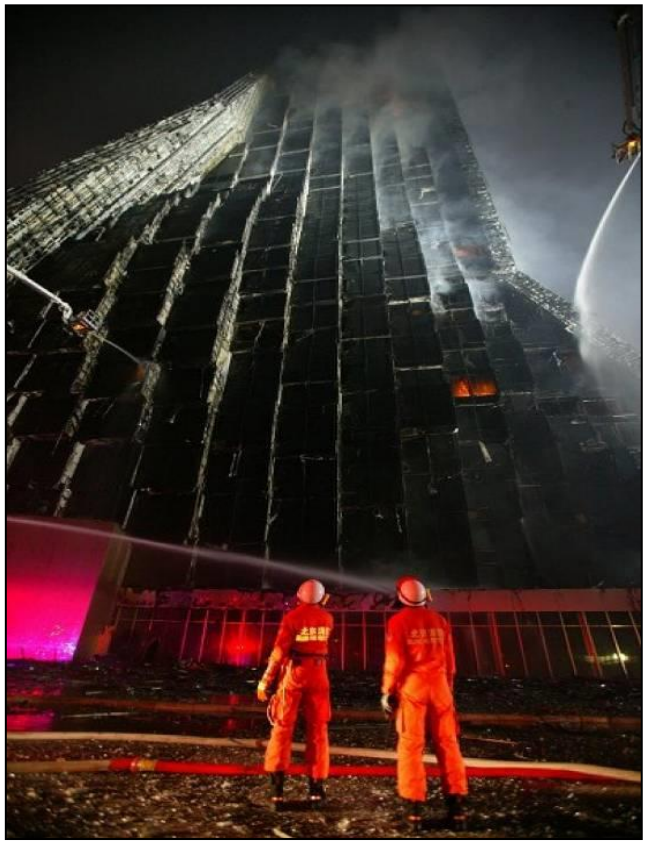
HOW OFTEN DOES A FIRE DEPARTMENT RESPOND TO A FIRE IN THE U.S?

CONSEQUENCES OF FIRES

A fire department responds to a fire every

23 seconds



Annual Direct Property Loss

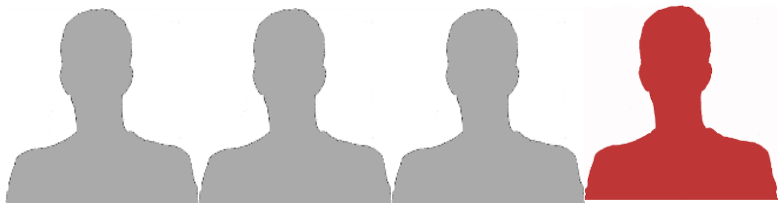
$11+ Billion

Annual Civilian Deaths

3000+ Lives Lost

WHAT IS THE LEADING CAUSE OF DEATH IN STRUCTURE FIRES?

STATISTICS



3/4 of all fire deaths are caused by smoke inhalation.

Source: Hall, Jr. John R. NFPA Fire Analysis & Research, Quincy, MA. “Burns, Toxic Gases, and other Hazards”.

Visibility: 47% of survivors caught in a fire could not see more than 12 feet.

Source: NFPA Fire Protection Handbook, 18th Ed. Table 1-1P. Pg.1-15.

Approximately 57% of people killed in fires are not in the room of the fire’s origin.

Source: NFPA Fire Protection Handbook, 18th Ed. Table 8-1P. Pg. 8-17.

Smoke travels 120-420 feet per minute under fire conditions

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WHAT IS FIRESTOP?

WHAT IS FIRESTOP?

- Firestop systems, **if installed correctly**, will help restore the rating of a floor or wall as it is penetrated by an object or joint and **resist the spread of smoke and fire**.

Why is it necessary?

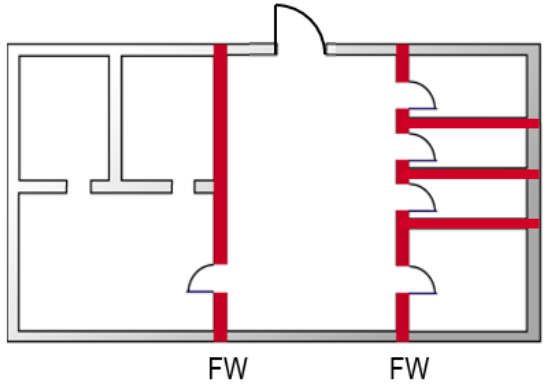
- To give people more time to safely exit a structure, even if they don't react right away.

- Mandated by the Codes -- IBC, NFPA, NECA

COMPARTMENTATION

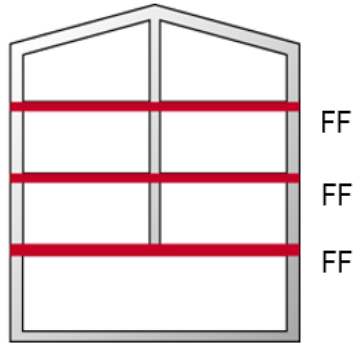
The spread of fire can be restricted by dividing a building into separate compartments with fire-resistive walls and floors—increasing the availability of escape routes for occupants.

Fire walls

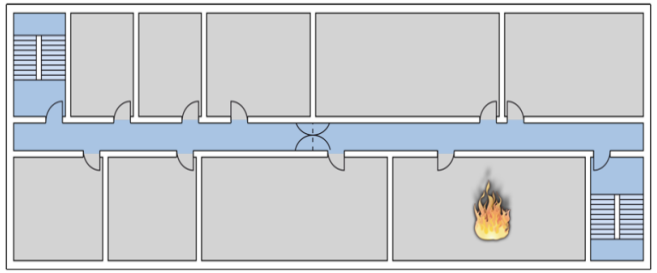


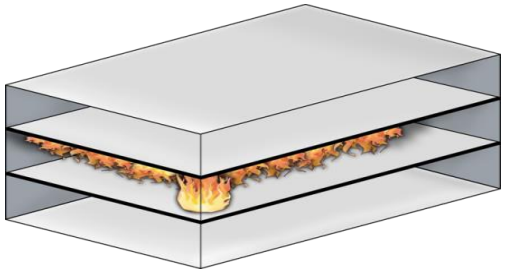
FW = Fire-Rated Wall

Fire floors



FF = Fire Rated Floor





WHERE AND HOW

- Not every barrier (wall/floor) is fire rated.

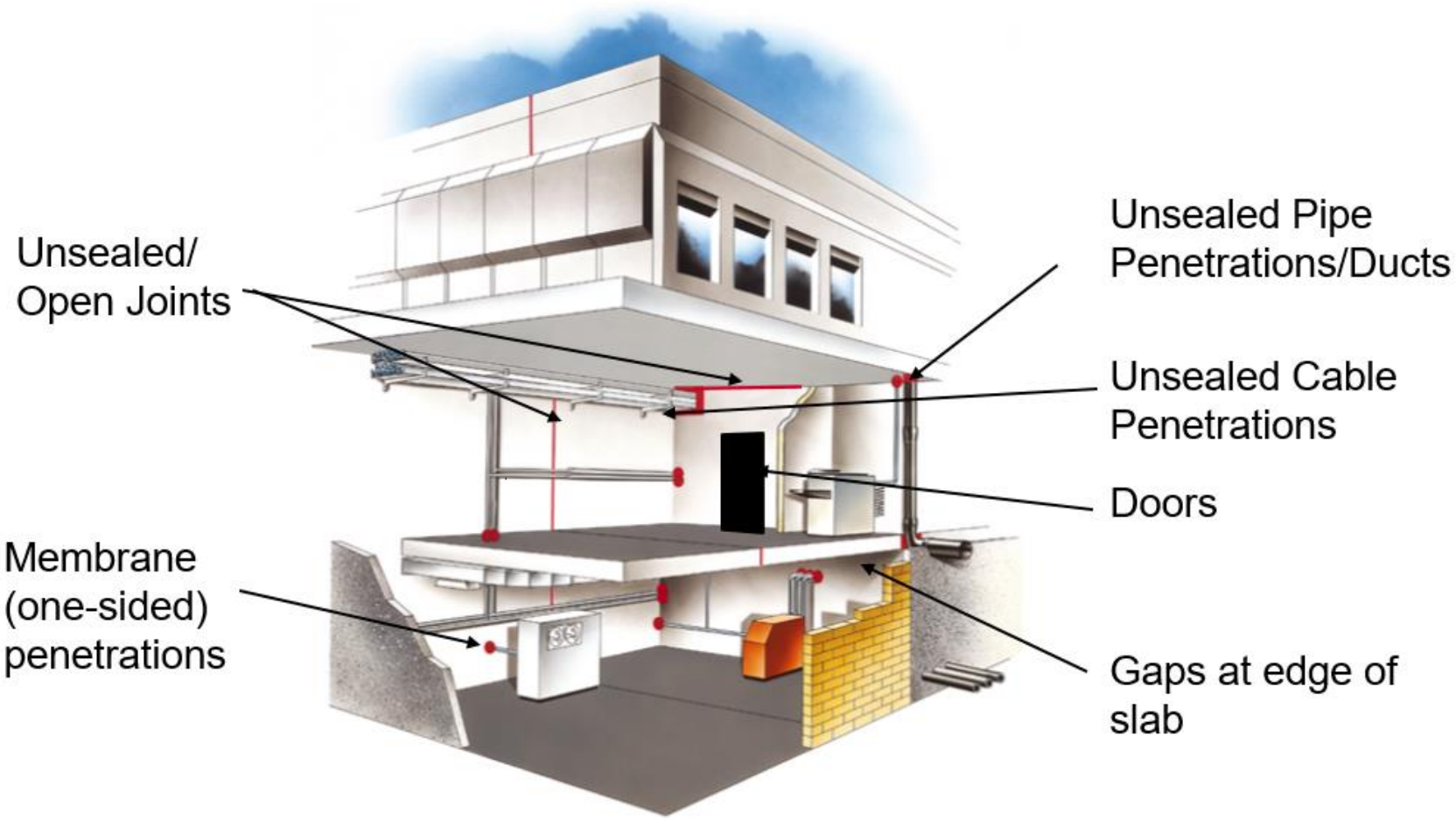
  Only specific barriers will require firestop.

- Architects design rated conditions for 1-4 hour(s) fire rating depending what is needed to meet life saftey requirments

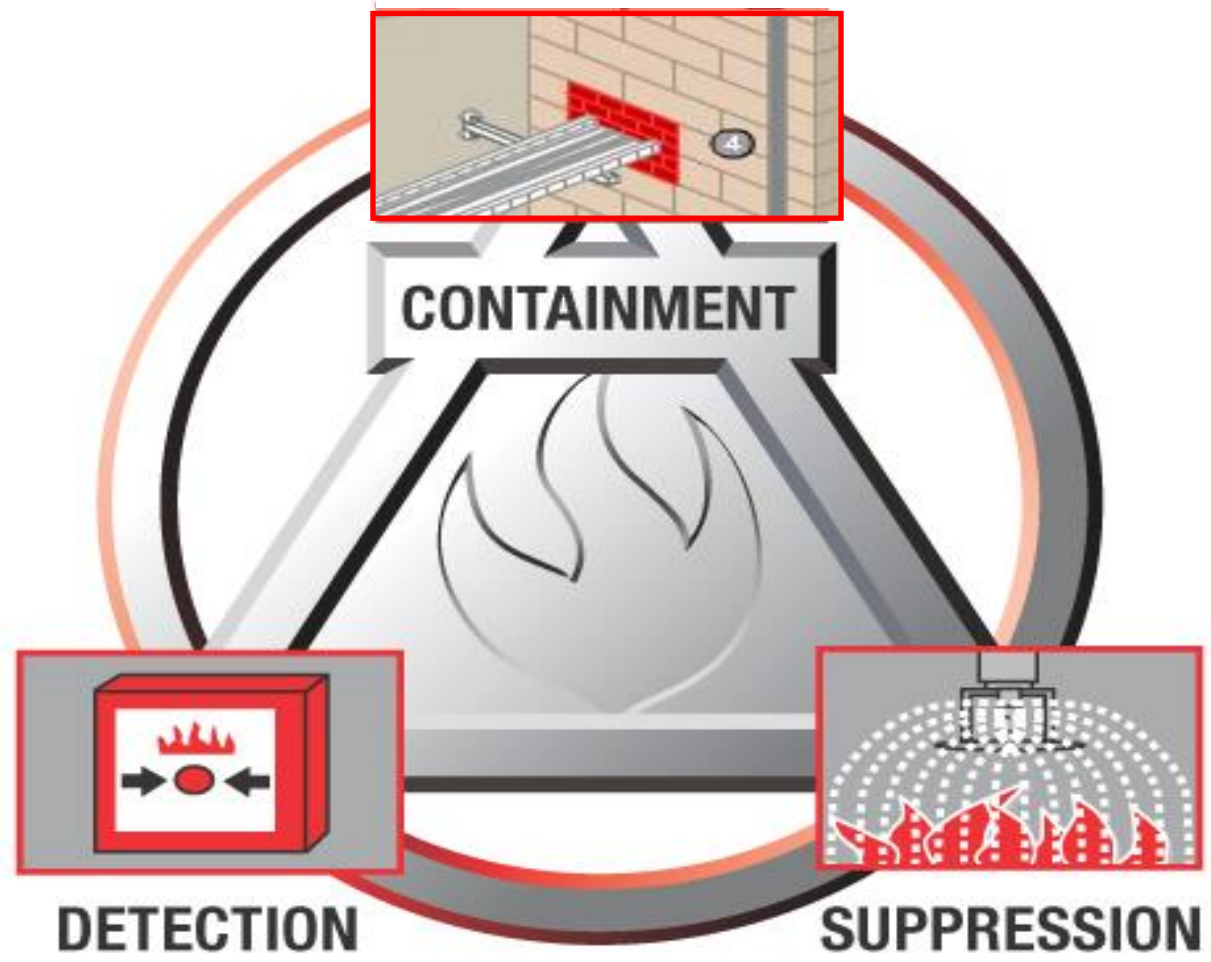
- Once these rated conditions are compromised by a through penetration or joint the rating is reduced to zero.

- To restore these barriers a **Firestop System** is needed.

AREAS THAT ALLOW THE SPREAD OF SMOKE/FIRE



BALANCED APPROACH TO FIRE PROTECTION



SUPPRESSION

- If not properly installed and maintained, active suppression systems may fail!
- Reasons suppression systems fail:
  - System is not turned on.
  - Nozzle or sprinkler is blocked or obstructed
  - Sprinkler branch lines are filled with sediment
  - Fire pump lines are filled with sediment
  - Systems are not actively maintained

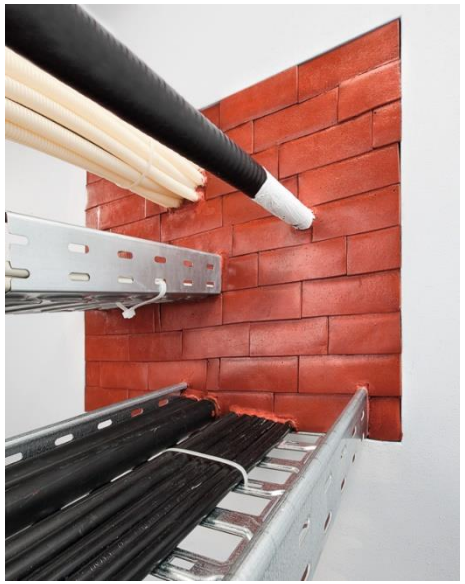
DETECTION

- If not properly installed and maintained, active detection systems may fail!
- Reasons detection systems fail:
  - System has a loss in power supply.
  - Detectors are blocked or obstructed
  - Detectors have been improperly placed or there is a defective unit
  - Incorrect type of detector is installed

CONTAINMENT

FIRESTOP

- Firestop is a passive system, not active.
- Contains fire to room or zone of origin.
- Once installed, required only periodic inspection compared to the maintenance and inspection of suppression and detection systems.
- Limits the spread of smoke & toxic gas.
- Allows occupants time to safely evacuating a building



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WHERE IT ALL BEGAN…

MGM Grand - 1980

- 84 dead
- 679 injured
- $223 million in claims
- Sprinklers & alarms malfunctioned & failed
- Fire started on 2nd floor
- Most deaths occurred on 16th floor and up

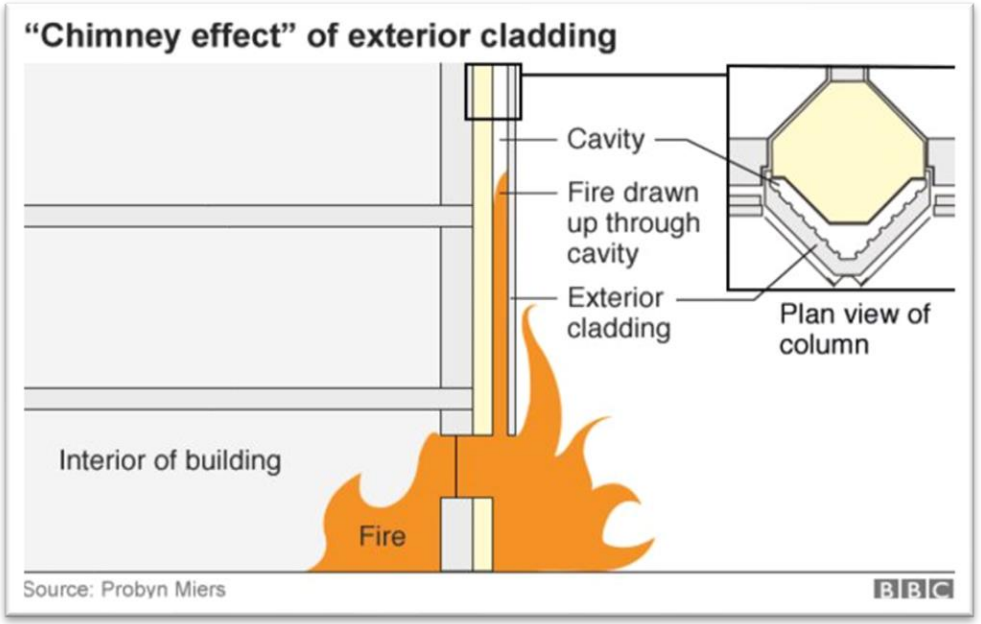
GRENFELL TOWER – 6/14/17

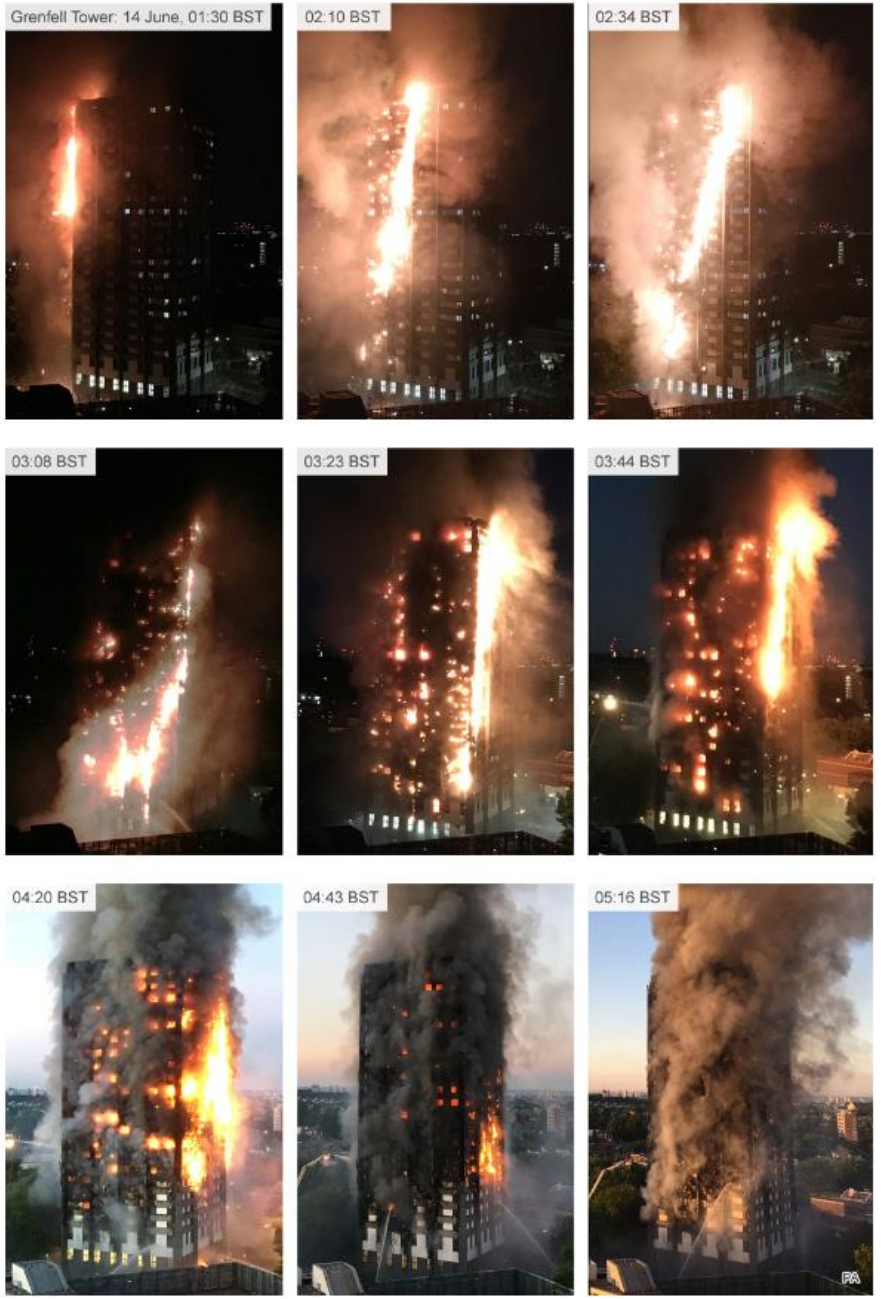
- 80 dead
- 4th floor freezer electrical short caused the fire
- Building Façade helped the blaze to spread quickly
- “The inquest found that botched renovations had removed fire-stopping material between flats and communal corridors, allowing a blaze to spread.”

Source www.dailymail.co.uk June 15, 2017

GRENFELL TOWER – 6/14/17

- First photo taken 1:30am
- Last photo taken 5:16am





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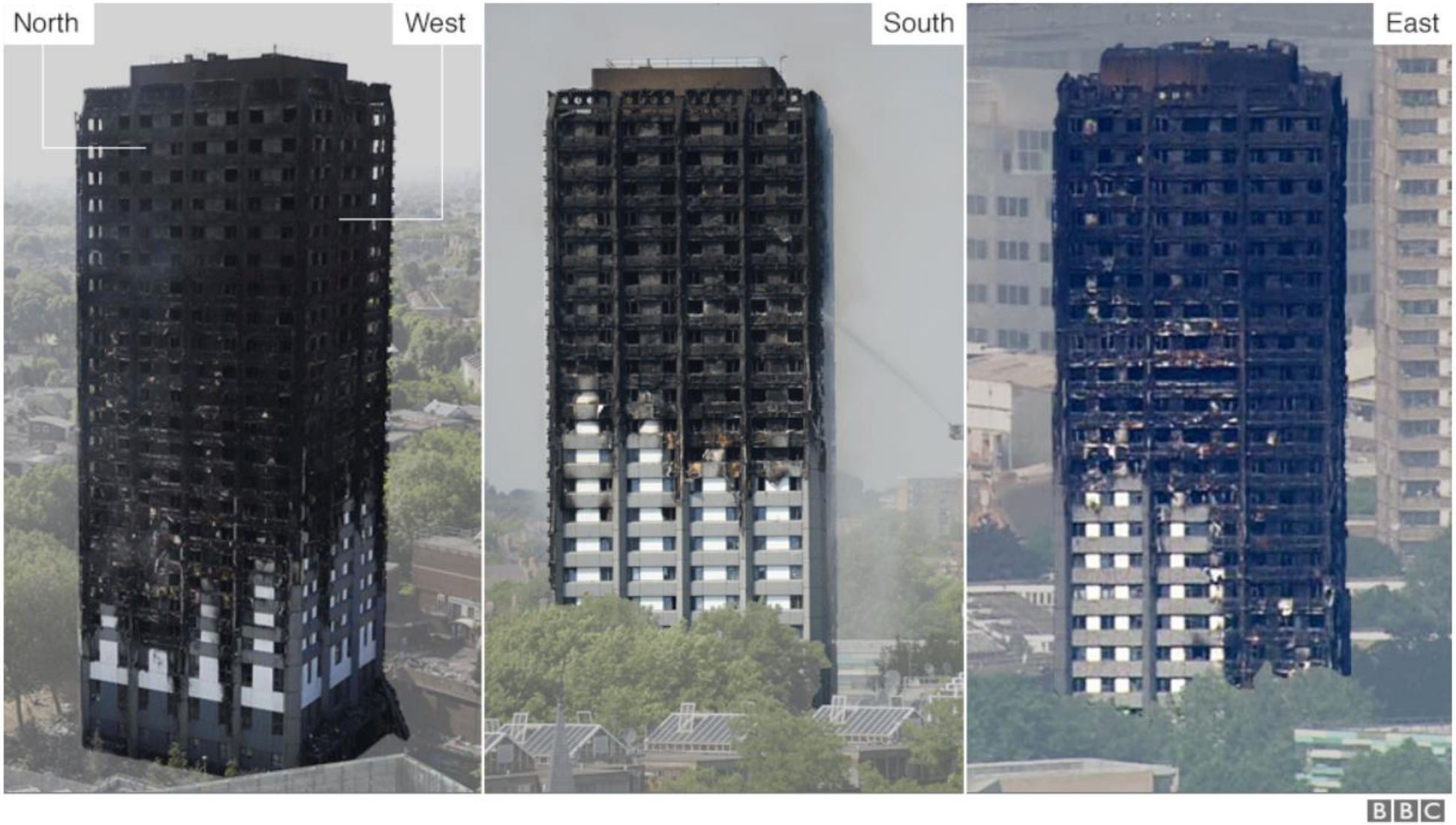


BUILDING FIRES - 2017

- Marco Polo Condiminimum – Honolulu
  - 3 Dead, 12 injured
  - Lack of sprinklers sighted

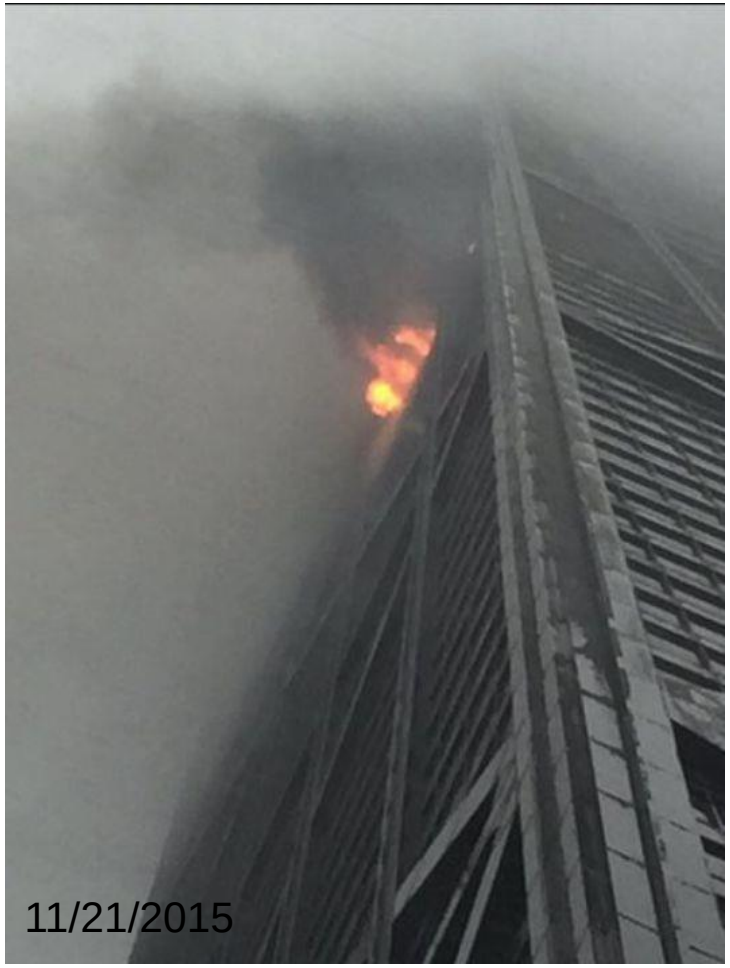
FIRE CLOSE TO HOME – 2015

Fire in John Hancock building caused by candle

POSTED 7:22 AM, NOVEMBER 23, 2015, BY WGN WEB DESK

HANCOCK RESIDENTS SAY ALARM SYSTEM FAILED DURING FIRE

5 injured in John Hancock Center fire

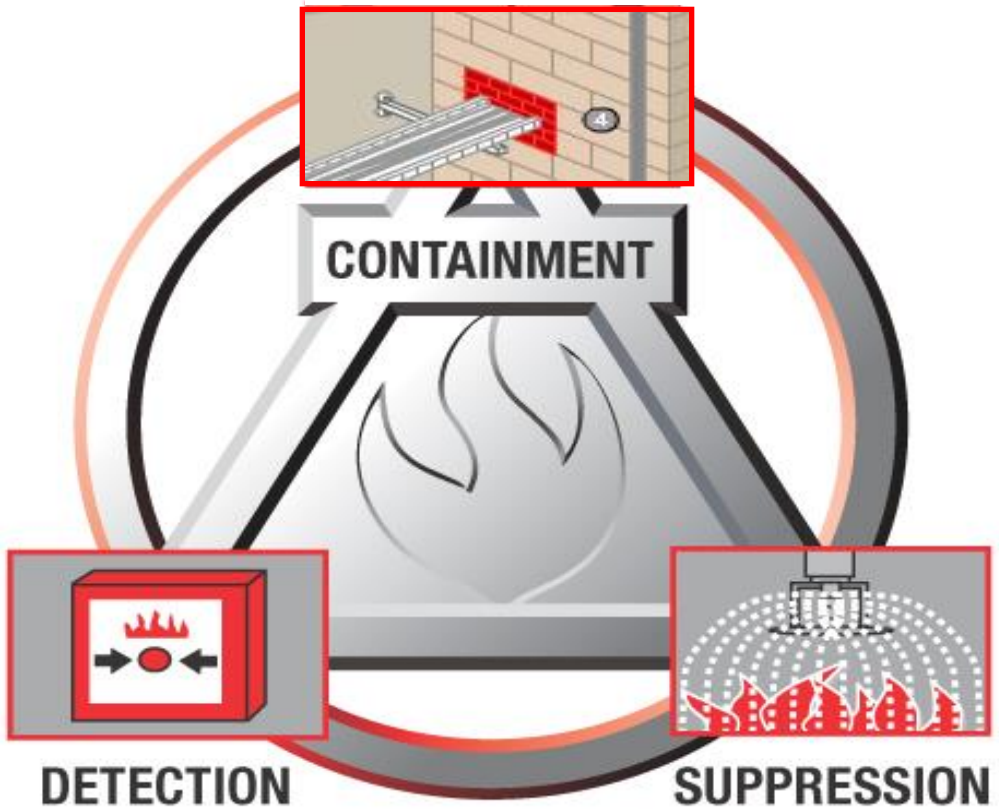


WHEN COMPARTMENTATION WORKS

- Hells Kitchen New York 2014
- Compartmentation worked to keep the blaze contained to its origin
- Started due to an overloaded power strip in an apartment on the 20th floor.
- One casualty due to smoke inhalation

Compartmentation in Action!!!

BALANCED APPROACH TO FIRE PROTECTION



We cannot rely on any single action or safeguard to keep people safe

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FIRESTOPPING IS NOT NEW:
REQUIRED BY ALL CURRENT AND LEGACY CODES

INTERNATIONAL BUILDING CODE (2015)

Section 712.3.1.2 – Through-penetration firestop systems

"Through-penetrations shall be protected by an approved penetration firestop **system** installed as tested in accordance with ASTM E 814 or UL 1479…"

Section 713.3 – Fire resistant joint systems

"Fire resistant joint **systems** shall be tested in accordance with the requirements of either ASTM-E1966 or UL 2079…"

What is the key term in the code language above?

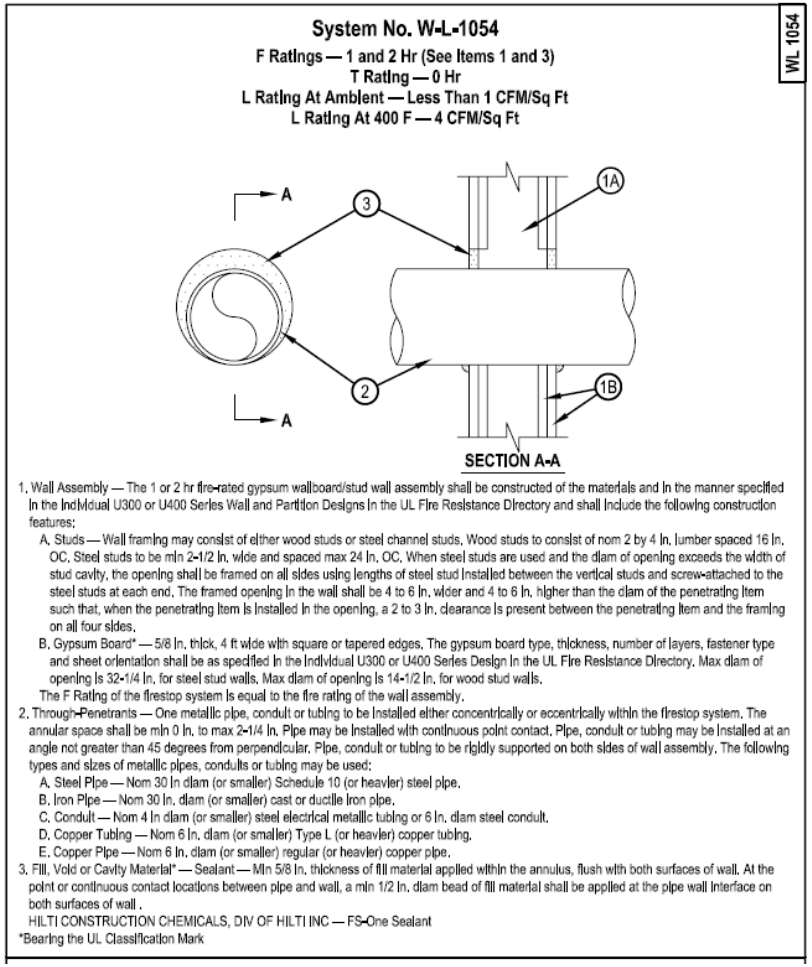
WHAT IS THE HOURLY RATING OF A FIRESTOP PRODUCT?

ZERO

Only firestop **systems** have ratings!

FIRESTOP SYSTEMS IDENTIFY EACH COMPONENT REQUIRED TO ACHIEVE THE DESIRED FIRE RATING

- Fire rated assembly construction components
- Acceptable size and type of penetrating items
- Firestop materials needed to fill voids
- Specified limits for size of opening, annular space, etc.
- Each tested system is given their own Firestop System Number



System No. W-L-1054

WL 1054

F Ratings — 1 and 2 Hr (See Items 1 and 3)
T Rating — 0 Hr
L Rating At Ambient — Less Than 1 CFM/Sq Ft
L Rating At 400 F — 4 CFM/Sq Ft

SECTION A-A

1. Wall Assembly — The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the Individual U300 or U400 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. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. OC. When steel studs are used and the diam of opening exceeds the width of stud cavity, the opening shall be framed on all sides using lengths of steel stud installed between the vertical studs and screw-attached to the steel studs at each end. The framed opening in the wall shall be 4 to 6 in. wider and 4 to 6 in. higher than the diam of the penetrating item such that, when the penetrating item is installed in the opening, a 2 to 3 in. clearance is present between the penetrating item and the framing on all four sides.
   B. Gypsum Board* — 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the Individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 32-1/4 in. for steel stud walls. Max diam of opening is 14-1/2 in. for wood stud walls.
   The F Rating of the firestop system is equal to the fire rating of the wall assembly.
2. Through-Penetrants — One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space shall be min 0 in. to max 2-1/4 in. Pipe may be installed with continuous point contact. Pipe, conduit or tubing may be installed at an angle not greater than 45 degrees from perpendicular. Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
   A. Steel Pipe — Nom 30 in diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. Iron Pipe — Nom 30 in. diam (or smaller) cast or ductile iron pipe.
   C. Conduit — Nom 4 in diam (or smaller) steel electrical metallic tubing or 6 in. diam steel conduit.
   D. Copper Tubing — Nom 6 in. diam (or smaller) Type L (or heavier) copper tubing.
   E. Copper Pipe — Nom 6 in. diam (or smaller) regular (or heavier) copper pipe.
3. Fill, Void or Cavity Material* — Sealant — Min 5/8 in. thickness of fill material applied within the annulus, flush with both surfaces of wall. At the point or continuous contact locations between pipe and wall, a min 1/2 in. diam bead of fill material shall be applied at the pipe wall interface on both surfaces of wall .
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant

*Bearing the UL Classification Mark

2014 PA Preferred Chocolate Cake Winning Recipes

BLUE RIBBON CHOCOLATE CAKE
Winning Recipes

1st Place
Clancein Donough
McClure Bean Soup Festival and Fair – Juniata County

Deep Dark Chocolate Cake

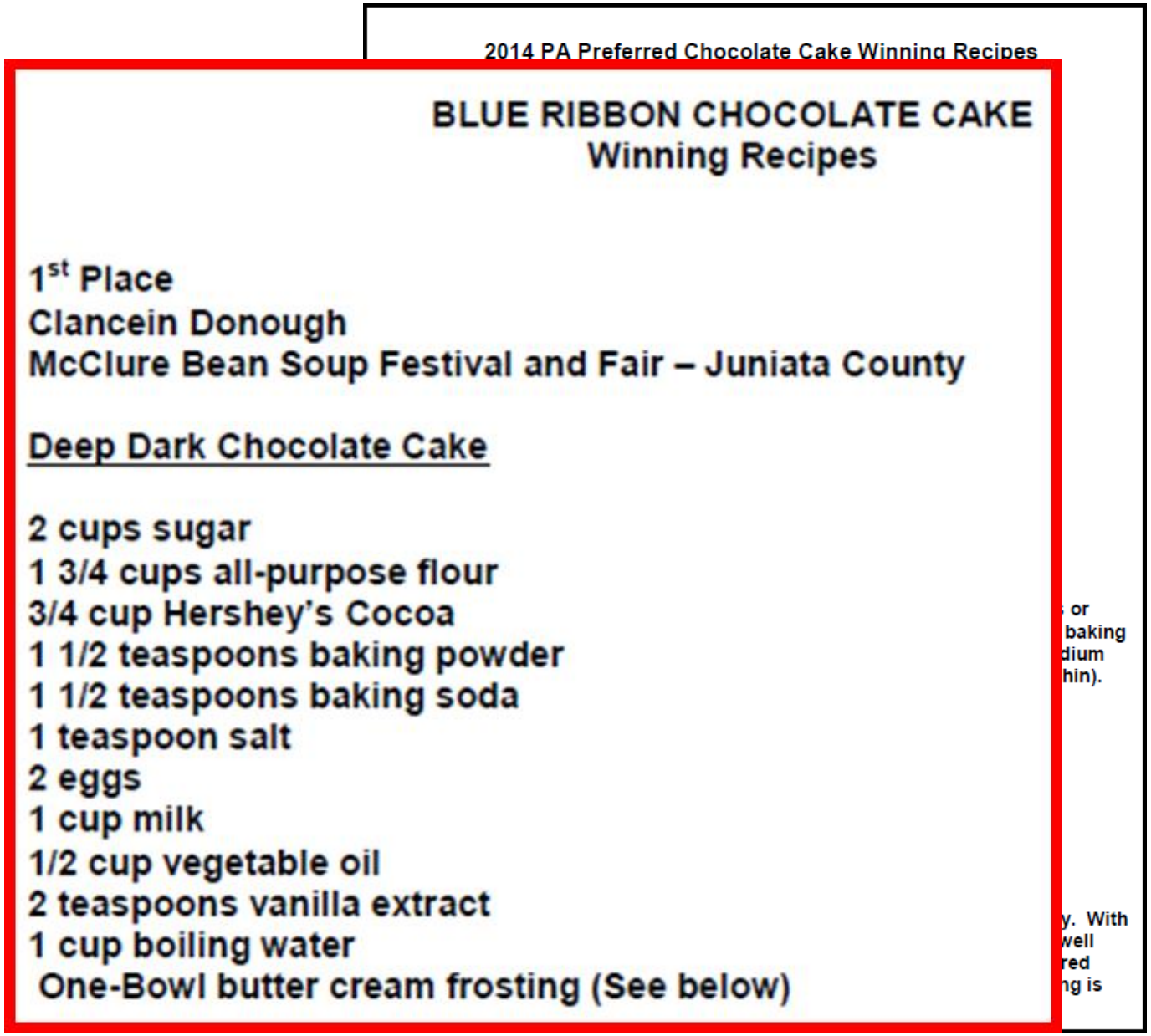
2 cups sugar
1 3/4 cups all-purpose flour
3/4 cup Hershey's Cocoa
1 1/2 teaspoons baking powder
1 1/2 teaspoons baking soda
1 teaspoon salt
2 eggs
1 cup milk
1/2 cup vegetable oil
2 teaspoons vanilla extract
1 cup boiling water
One-Bowl butter cream frosting (See below)

Heat oven to 350 degrees. Grease and flour two 9-inch round baking pans or 13x9x2 inch baking pan. In large mixer bowl combine sugar, flour, cocoa, baking powder, baking soda and salt. Add eggs, milk, oil and vanilla; beat on medium speed 2 minutes. Remove from mixer; stir in boiling water (batter will be thin). Pour into prepared pan(s). Bake 30 to 35 minutes for round pans, 35 to 40 minutes for rectangular pan, or until wooden pick inserted in center.

Vanilla Buttercream Frosting

1/3 cup butter or margarine, softened
4 cups powdered sugar, divided
3 to 4 tablespoons milk
1 1/2 teaspoons vanilla extract

Beat butter with electric mixer on medium speed in large bowl until creamy. With mixer running, gradually add about 2 cups powdered sugar, beating until well blended. Slowly beat in milk and vanilla. Gradually add remaining powdered sugar, beating until smooth. Add additional milk, if necessary, until frosting is desired consistency.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UL/cUL SYSTEM NO. C-AJ-1421

METAL PIPE IN A SLEEVE THROUGH CONCRETE FLOOR/WALL OR BLOCK WALL

F-RATING = 2-HR. OR 3-HR.

T-RATING = 0-HR.

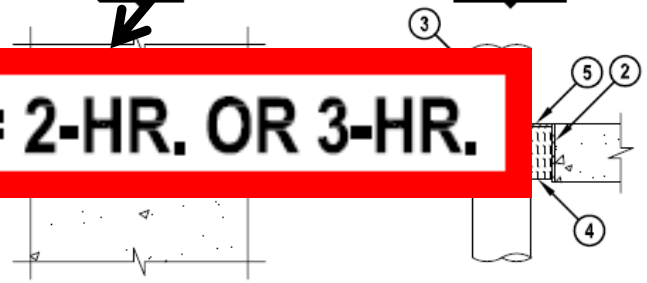
L-RATING AT AMBIENT = LESS THAN 1 CFM / SQ FT

L-RATING AT 400° F = LESS THAN 1 CFM / SQ FT

CAJ1421h.011515

TOP VIEW

SECTION A-A



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   A. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR OR WALL (MINIMUM 4-1/2" THICK).
   B. ANY UL/cUL CLASSIFIED CONCRETE BLOCK WALL.
2. [OPTIONAL] MAXIMUM 6" DIAMETER STEEL PIPE SLEEVE (SCHEDULE 40 OR HEAVIER).
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 4" DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
   B. MAXIMUM 4" DIAMETER CAST IRON PIPE.
   C. MAXIMUM 4" NOMINAL DIAMETER COPPER PIPE.
   D. MAXIMUM 4" NOMINAL DIAMETER STEEL CONDUIT OR EMT.
4. MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) TIGHTLY PACKED.
5. MINIMUM 1/4" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT, HILTI CP 604 SELF-LEVELING FIRESTOP SEALANT, HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT, OR HILTI CFS-S SIL SL FIRESTOP SILICONE SEALANT.
6. MINIMUM 1/4" BEAD HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT OR HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT APPLIED AT POINT OF CONTACT (NOT REQUIRED WHEN HILTI CP 604 SELF-LEVELING FIRESTOP SEALANT OR HILTI CFS-S SIL SL FIRESTOP SILICONE SEALANT IS USED, ITEM NO. 5).

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 6".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 5-3/8".
3. MINIMUM 1/4" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT OR HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT IS REQUIRED ON BOTH SIDES OF A WALL ASSEMBLY.
4. F-RATING IS 3-HR. WHEN HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT IS USED, AND 2-HR. WHEN HILTI CP 604 SELF-LEVELING FIRESTOP SEALANT, HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT, OR HILTI CFS-S SIL SL FIRESTOP SILICONE SEALANT IS USED.

HILTI Firestop Systems

HILTI, Inc.
Tulsa, Oklahoma USA (800) 879-8000

Sheet	1 of 1
Scale	7/64" = 1"
Date	Jan. 15, 2015

Drawing No. CAJ 1421h

Saving Lives through Innovation and Education

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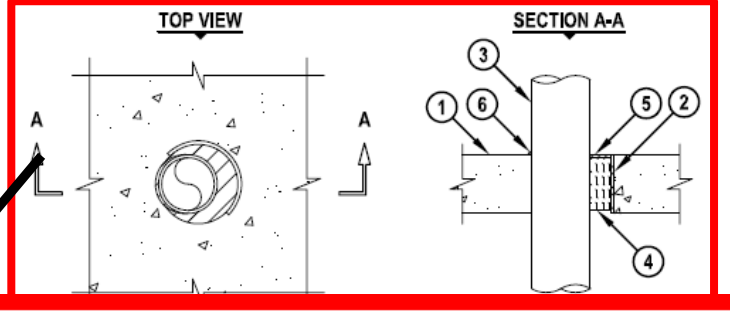

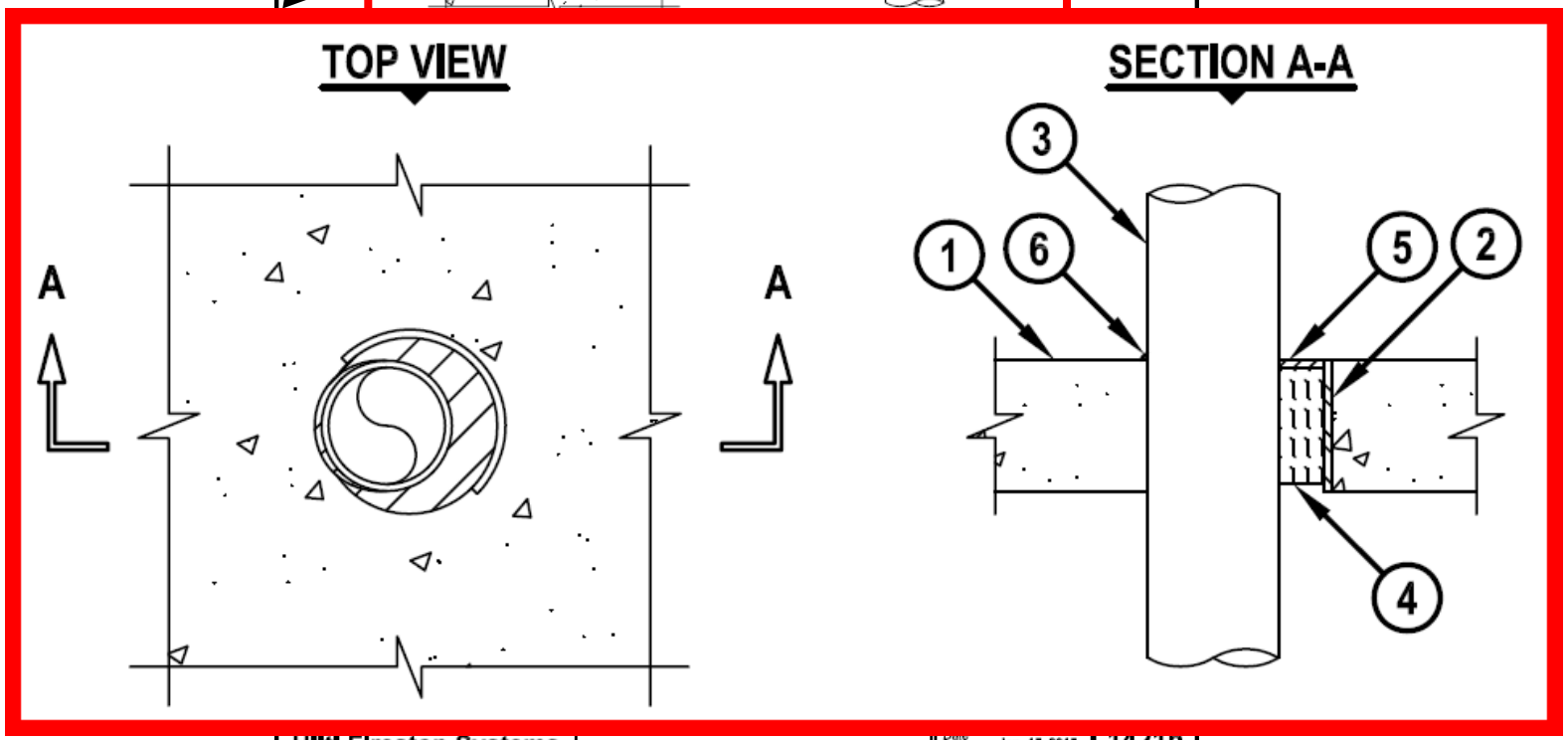

Hilti Firestop Systems | Date: Jan. 15, 2015 | 1421h

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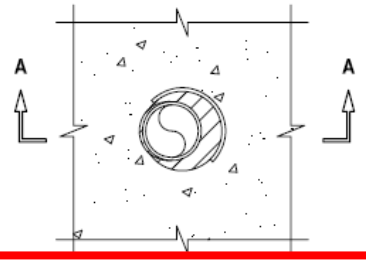
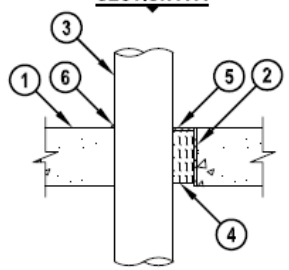
TOP VIEW



SECTION A-A



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USED, AND 2-HR. WHEN HILTI CP 604 SELF-LEVELING FIRESTOP SEALANT, HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT, OR HILTI CFS-S SIL SL FIRESTOP SILICONE SEALANT IS USED.

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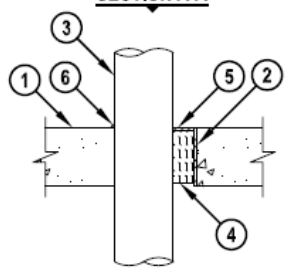
SECTION A-A



1. CONCRETE FLOOR OR WALL ASSEMBLY (2-HR. OR 3-HR. FIRE-RATING) :
   A. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR OR WALL (MINIMUM 4-1/2" THICK).
   B. ANY UL/cUL CLASSIFIED CONCRETE BLOCK WALL.
2. [OPTIONAL] MAXIMUM 6" DIAMETER STEEL PIPE SLEEVE (SCHEDULE 40 OR HEAVIER).
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 4" DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
   B. MAXIMUM 4" DIAMETER CAST IRON PIPE.
   C. MAXIMUM 4" NOMINAL DIAMETER COPPER PIPE.
   D. MAXIMUM 4" NOMINAL DIAMETER STEEL CONDUIT OR EMT.
4. MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) TIGHTLY PACKED.
5. MINIMUM 1/4" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT, HILTI CP 604 SELF-LEVELING FIRESTOP SEALANT, HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT, OR HILTI CFS-S SIL SL FIRESTOP SILICONE SEALANT.
6. MINIMUM 1/4" BEAD HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT OR HILTI CFS-S

2. [OPTIONAL] MAXIMUM 6" DIAMETER STEEL PIPE SLEEVE (SCHEDULE 40 OR HEAVIER).
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 4" DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
   B. MAXIMUM 4" DIAMETER CAST IRON PIPE.
   C. MAXIMUM 4" NOMINAL DIAMETER COPPER PIPE.
   D. MAXIMUM 4" NOMINAL DIAMETER STEEL CONDUIT OR EMT.

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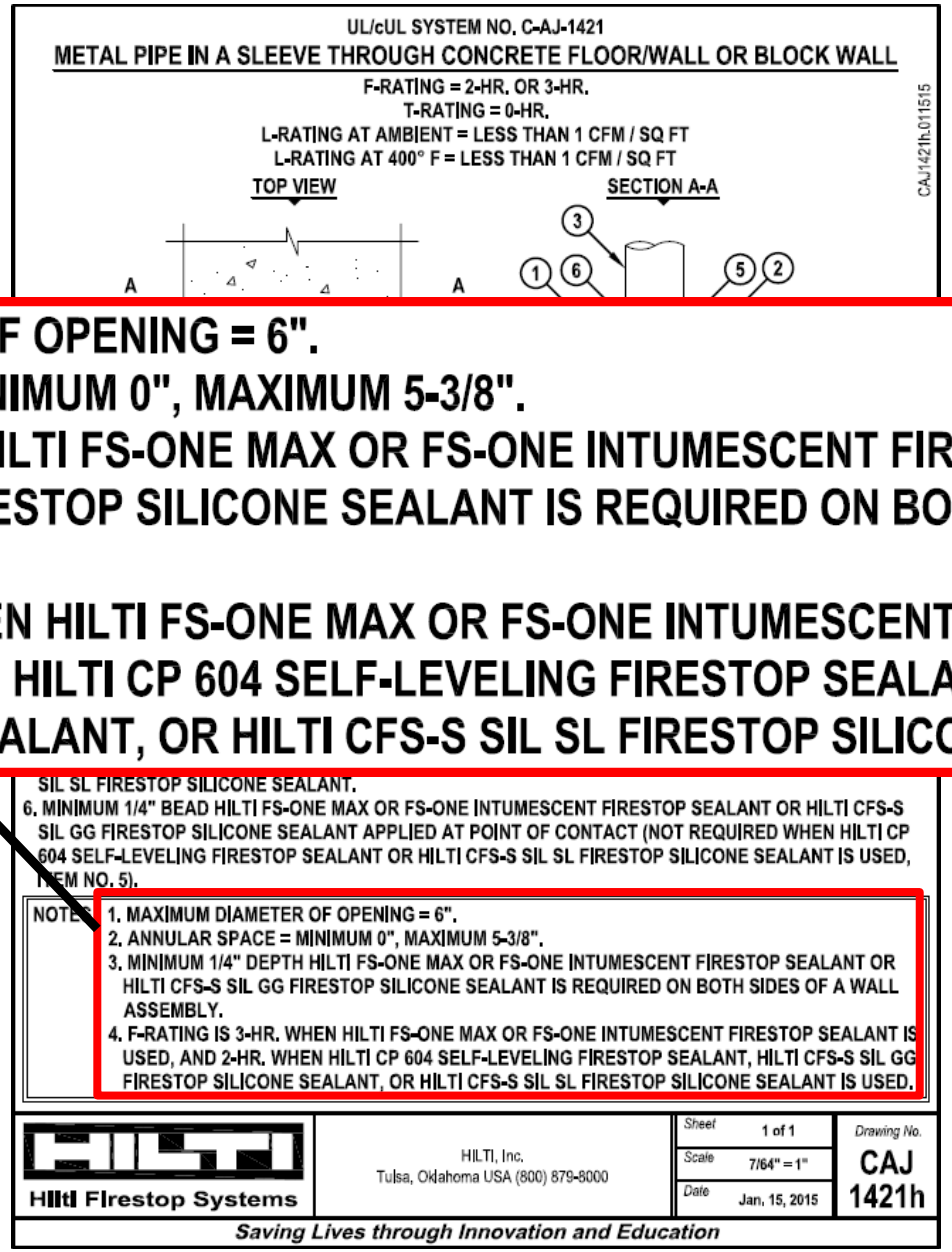

UL/cUL SYSTEM NO. C-AJ-1421

METAL PIPE IN A SLEEVE THROUGH CONCRETE FLOOR/WALL OR BLOCK WALL

F-RATING = 2-HR. OR 3-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

CAJ1421h.011515

TOP VIEW

SECTION A-A

SIL SL FIRESTOP SILICONE SEALANT.

6. MINIMUM 1/4" BEAD HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT OR HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT APPLIED AT POINT OF CONTACT (NOT REQUIRED WHEN HILTI CP 604 SELF-LEVELING FIRESTOP SEALANT OR HILTI CFS-S SIL SL FIRESTOP SILICONE SEALANT IS USED, ITEM NO. 5).

NOTES

1. MAXIMUM DIAMETER OF OPENING = 6".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 5-3/8".
3. MINIMUM 1/4" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT OR HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT IS REQUIRED ON BOTH SIDES OF A WALL ASSEMBLY.
4. F-RATING IS 3-HR. WHEN HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT IS USED, AND 2-HR. WHEN HILTI CP 604 SELF-LEVELING FIRESTOP SEALANT, HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT, OR HILTI CFS-S SIL SL FIRESTOP SILICONE SEALANT IS USED.

Hilti Firestop Systems

HILTI, Inc.
Tulsa, Oklahoma USA (800) 879-8000

Sheet 1 of 1
Scale 7/64" = 1"
Date Jan. 15, 2015

Drawing No. CAJ 1421h

Saving Lives through Innovation and Education

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 6".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 5-3/8".
3. MINIMUM 1/4" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT OR HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT IS REQUIRED ON BOTH SIDES OF A WALL ASSEMBLY.
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UL/cUL SYSTEM NO. C-AJ-1421

METAL PIPE IN A SLEEVE THROUGH CONCRETE FLOOR/WALL OR BLOCK WALL

4. MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) TIGHTLY PACKED.
5. MINIMUM 1/4" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT, HILTI CP 604 SELF-LEVELING FIRESTOP SEALANT, HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT, OR HILTI CFS-S SIL SL FIRESTOP SILICONE SEALANT.
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3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 4" DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
   B. MAXIMUM 4" DIAMETER CAST IRON PIPE.
   C. MAXIMUM 4" NOMINAL DIAMETER COPPER PIPE.
   D. MAXIMUM 4" NOMINAL DIAMETER STEEL CONDUIT OR EMT.
4. MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) TIGHTLY PACKED.
5. MINIMUM 1/4" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT, HILTI CP 604 SELF-LEVELING FIRESTOP SEALANT, HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT, OR HILTI CFS-S SIL SL FIRESTOP SILICONE SEALANT.
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4. F-RATING IS 3-HR. WHEN HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT IS USED, AND 2-HR. WHEN HILTI CP 604 SELF-LEVELING FIRESTOP SEALANT, HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT, OR HILTI CFS-S SIL SL FIRESTOP SILICONE SEALANT IS USED.

HILTI Firestop Systems

HILTI, Inc.
Tulsa, Oklahoma USA (800) 879-8000

Sheet	1 of 1
Scale	7/64" = 1"
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AGENDA

Consequences of Fires

What is Firestop?

Fire Incident Examples

Fire Safe Building Construction & Code Requirements

Firestop System Testing

Selecting Firestop Systems

Firestop Installation Examples

INTERNATIONAL BUILDING CODE (2012)

Code Section	Category	Referenced Test Standard
714.3.1.2	Through Penetrations (Walls)	ASTM E814 or UL 1479
714.4.1.2	Through Penetrations (Floors)	ASTM E814 or UL 1479
714.3.2	Membrane Penetrations	ASTM E814 or UL 1479
715.3	Fire Resistant Joints Systems	ASTM E1966 or UL 2079
715.4	Exterior Curtain Wall/Floor Intersection (Perimeter Joint)	ASTM E2307
1705.16	Special Inspections of Fire Resistant Penetration & Joints	Penetrations: ASTM E 2174 Joints: ASTM 2393

Understanding the testing process is key to designing fire resistant systems

FACTORS THAT AFFECT PENETRATION FIRE PERFORMANCE

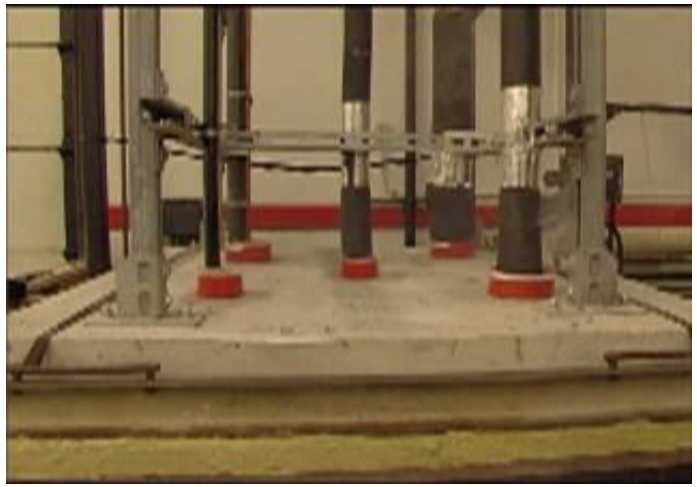
Through Penetrations

- Size and type of penetrating item(s)
- Size and shape of opening
- Desired fire rating (hrs.)
- Floor or wall construction type and thickness
- Annular space
- Firestop products used

Once a tested firestop system has achieved the desired fire ratings, then a “Firestop System” is issued (published) by the testing agency

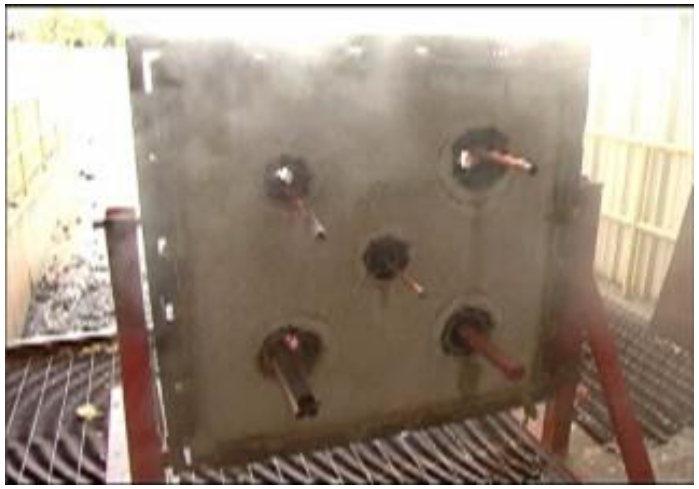
STEPS IN FIRE TEST PROCEDURES

Assembly is placed on furnace.



Assembly is exposed to fire test.

Assembly is subjected to hose stream test.



Assembly results after hose stream.

HOSE STREAM TEST VERIFIES INTEGRITY

Stream delivered through 2½ inch hose with a straight-bore nozzle at:

- 30 psi - 1, 2 & 3-hour tests
- 45 psi - 4-hour test

Time duration calculated based upon the area of the test assembly and the fire resistance period.

INTUMESCENT MATERIAL

KEY TAKEAWAYS

Proper Application

Proper Tooling

Hose Stream Test

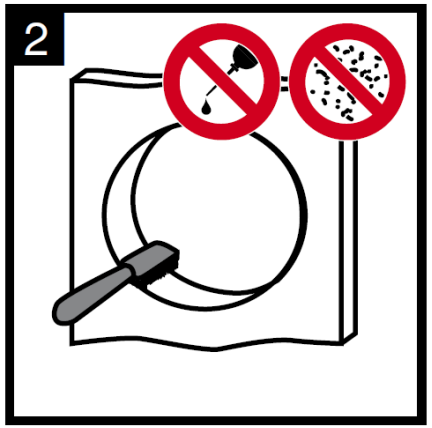
Penetration firestop systems installed & tested per ASTM E 814 standard.

System Selection

Always refer to appropriate UL listed firestop assembly or HILTI manufacturer‘s Engineering Judgment for complete installation information.

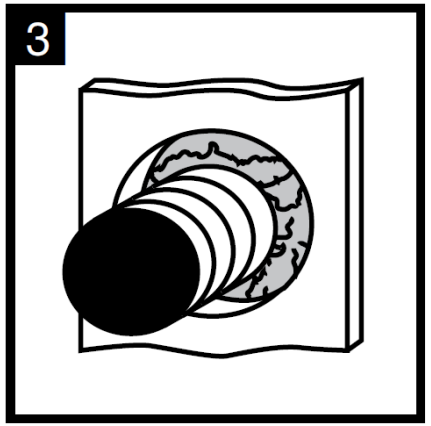
Cleaning

Clean the opening. Surfaces to which sealant will be applied should be cleaned of loose debris, dirt, oil, wax, and grease. The surface should be moisture & frost free.



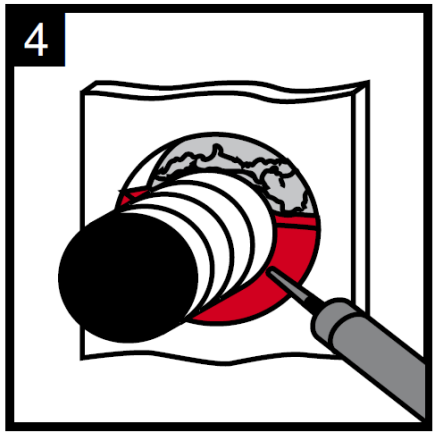
Backing Material?

Insert fill of mineral wool or backer (as required).



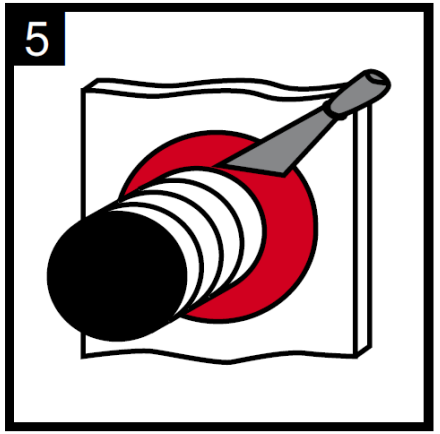
Dispense Sealant

Apply firestop sealant (over backer material if backer material is required).



Tooling

Smooth firestop sealant with a trowel.



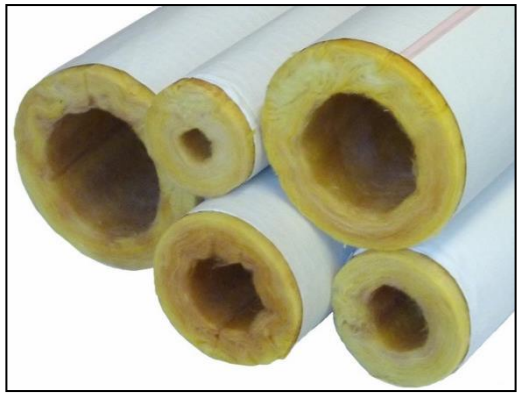
MELTING POINTS OF COMMON MATERIALS

PVC Plastic	Fiberglas® Insulation	Aluminum
413 °F	1,100 °F	1,220 °F

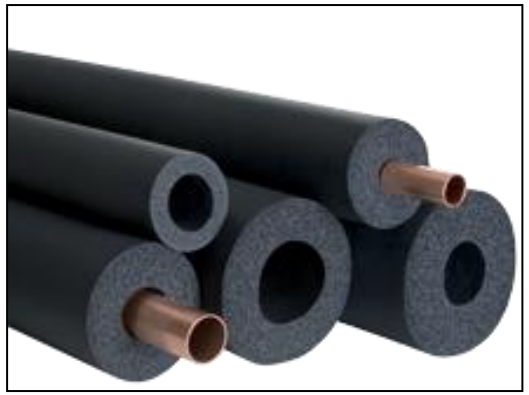
Systems are tested reaching 1300 F within 10 minutes of burn.

PIPE INSULATION

Glass Fiber



AB/PVC



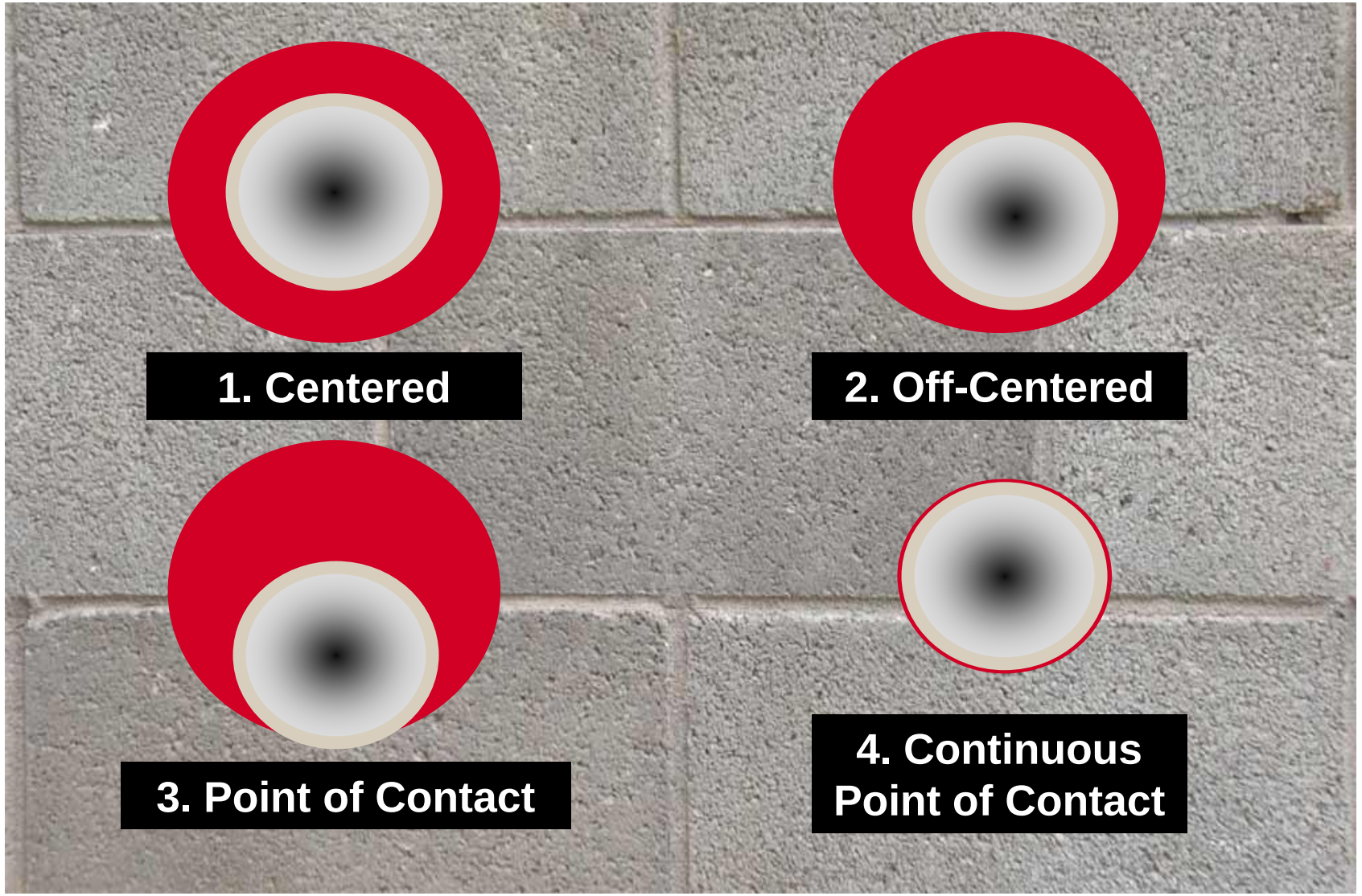
Mineral Fiber

Calcium Silicate

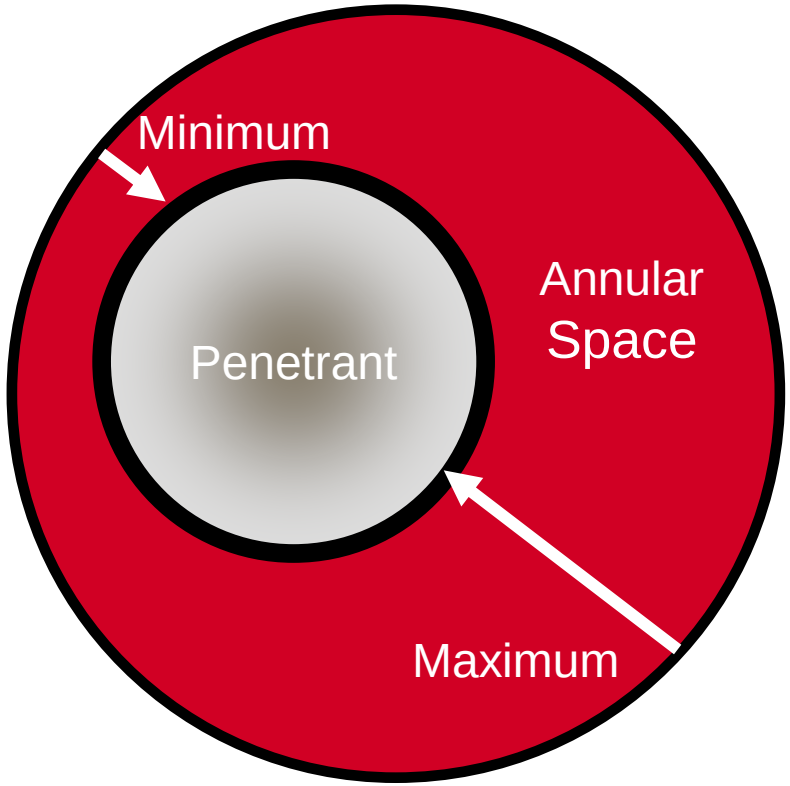
Cellular Foam

Polyethylene

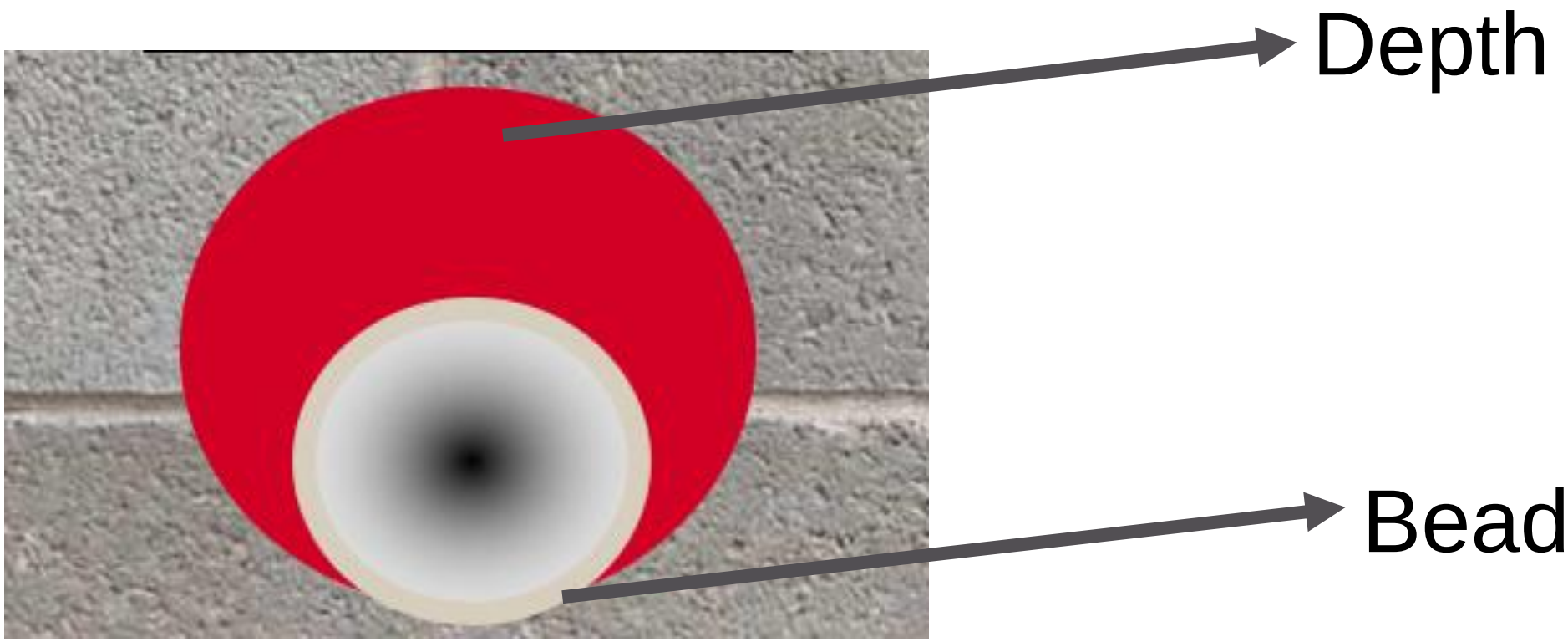
ANNULAR SPACE TERMINOLOGY



ANNULAR SPACE



“BEAD” VS “DEPTH”



UL/cUL SYSTEM NO. C-AJ-1421

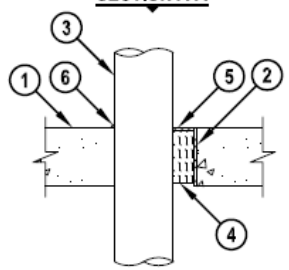
METAL PIPE IN A SLEEVE THROUGH CONCRETE FLOOR/WALL OR BLOCK WALL

F-RATING = 2-HR. OR 3-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

CAJ1421h.011515

TOP VIEW

SECTION A-A



1. CONCRETE FLOOR OR WALL ASSEMBLY (2-HR. OR 3-HR. FIRE-RATING) :
   A. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR OR WALL (MINIMUM 4-1/2" THICK).
   B. ANY UL/cUL CLASSIFIED CONCRETE BLOCK WALL.
2. [OPTIONAL] MAXIMUM 6" DIAMETER STEEL PIPE SLEEVE (SCHEDULE 40 OR HEAVIER).
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 4" DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
   B. MAXIMUM 4" DIAMETER CAST IRON PIPE.

2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 5-3/8".

6. MINIMUM 1/4" BEAD HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT OR HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT APPLIED AT POINT OF CONTACT (NOT REQUIRED WHEN HILTI CP 604 SELF-LEVELING FIRESTOP SEALANT OR HILTI CFS-S SIL SL FIRESTOP SILICONE SEALANT IS USED, ITEM NO. 5).

NOTES
1. MAXIMUM DIAMETER OF OPENING = 6".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 5-3/8".
3. MINIMUM 1/4" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT OR HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT IS REQUIRED ON BOTH SIDES OF A WALL ASSEMBLY.
4. F-RATING IS 3-HR. WHEN HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT IS USED, AND 2-HR. WHEN HILTI CP 604 SELF-LEVELING FIRESTOP SEALANT, HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT, OR HILTI CFS-S SIL SL FIRESTOP SILICONE SEALANT IS USED.

HILTI Firestop Systems

HILTI, Inc.
Tulsa, Oklahoma USA (800) 879-8000

Sheet	1 of 1
Scale	7/64" = 1"
Date	Jan. 15, 2015

Drawing No. CAJ 1421h

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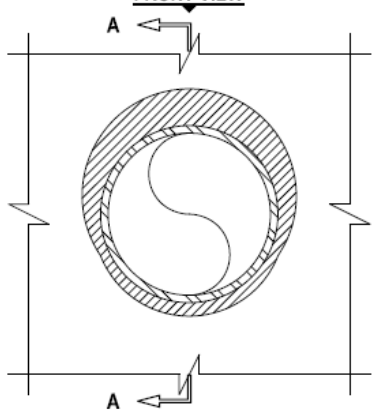
UL/cUL SYSTEM NO. W-L-1054

METAL PIPE THROUGH GYPSUM WALL ASSEMBLY

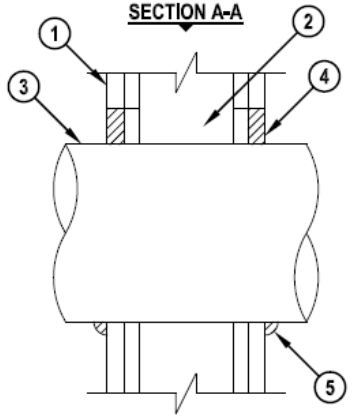
F-RATING = 1-HR. OR 2-HR.
T-RATING = 0-HR.
L-RATING AT AMBIENT = LESS THAN 1 CFM / SQ FT
L-RATING AT 400°F = LESS THAN 1 CFM / SQ FT

WL1054u.041316

FRONT VIEW



SECTION A-A



1. GYPSUM WALL ASSEMBLY (UL/cUL CLASSIFIED U300 OR U400 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).

3. PIPE MAY BE INSTALLED WITH CONTINUOUS POINT OF CONTACT.

[illegible] MAXIMUM 6" NOMINAL DIAMETER STEEL CONDUIT.
[illegible] MAXIMUM 4" NOMINAL DIAMETER EMT.
4. MINIMUM 5/8" DEPTH HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.
5. MINIMUM 1/2" BEAD HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING :
A. 32-1/4" FOR STEEL STUD WALLS.
B. 14-1/2" FOR WOOD STUD WALLS.
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 2-1/4"
3. PIPE MAY BE INSTALLED WITH CONTINUOUS POINT OF CONTACT.

HILTI Firestop Systems

HILTI, Inc,
Plano, Texas USA (800) 879-8000

Sheet	1 of 1
Scale	7/32" = 1"
Date	Apr. 13, 2016

Drawing No. WL 1054u

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RATINGS

F-Rating

The duration of time in which flames do not pass through the system.

T-Rating

The time period that the penetration firestop system, including the penetrating item, limits the maximum temperature rise to 325°F (163°C) above its initial temperature through the penetration on the non-fire side when tested in accordance with ASTM E 814.

L-Rating

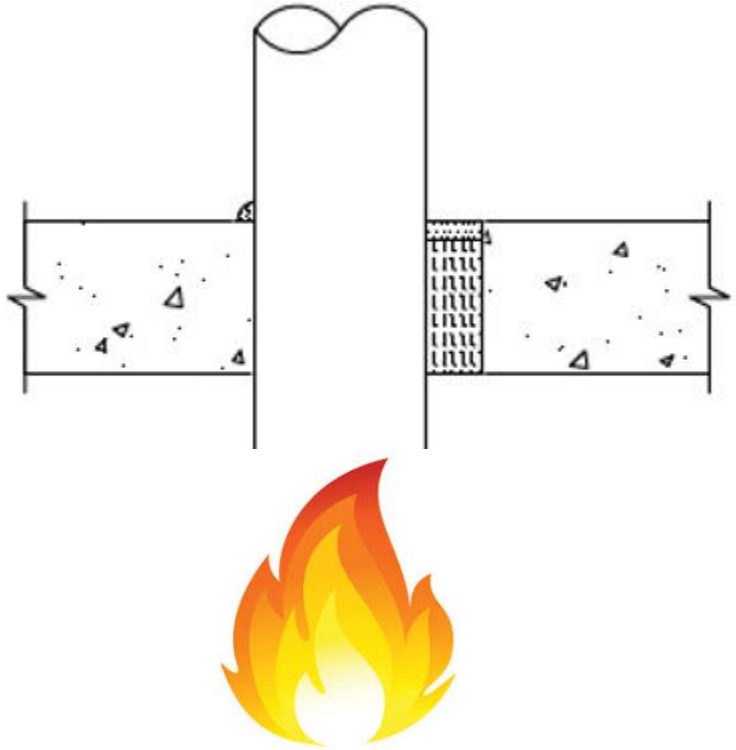
Measures the amount of air leakage through the firestop system.

W-Rating

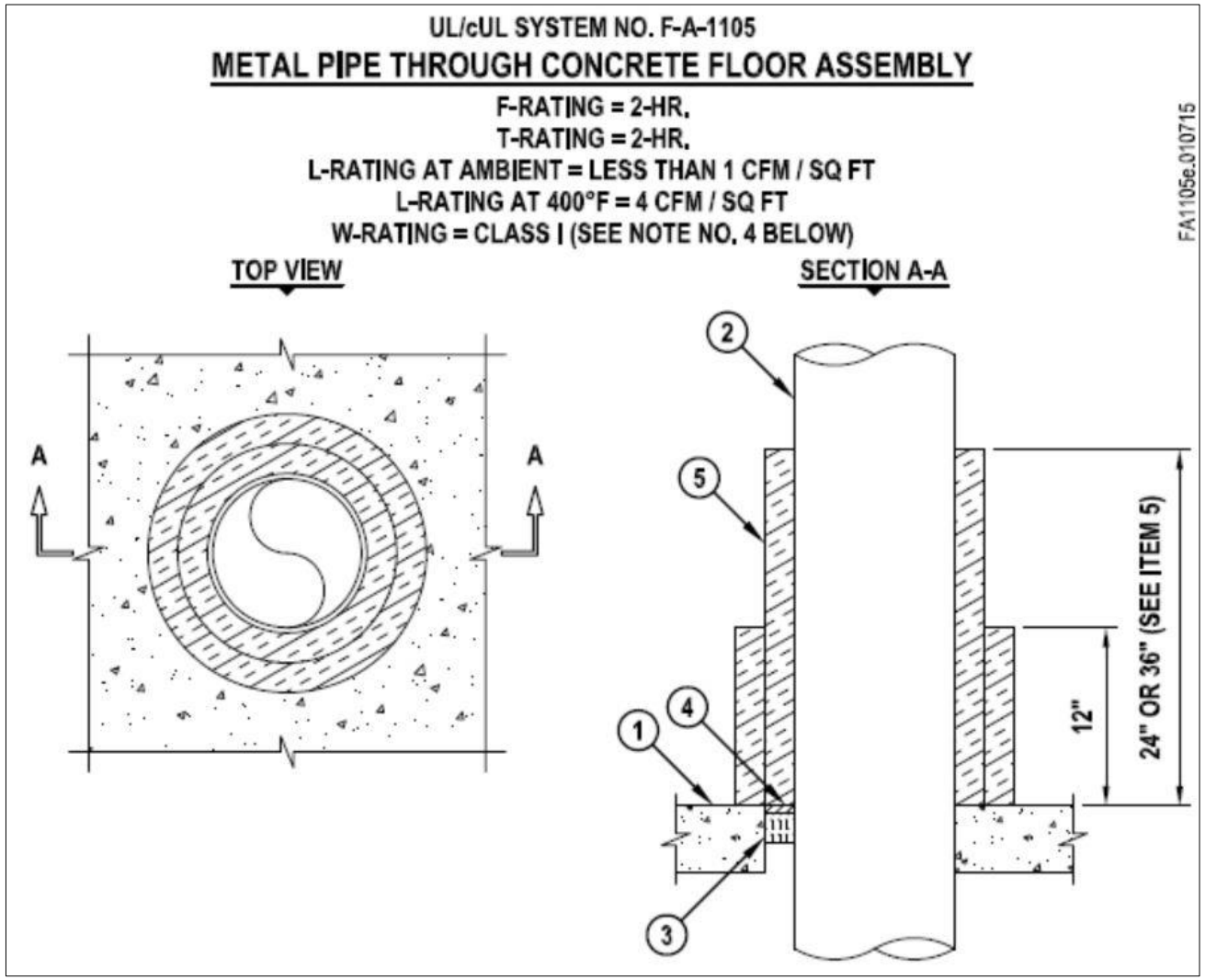
Tested to resist up to 3 feet of water column for 72 hours.

T-RATING

The time period that the penetration firestop system, including the penetrating item, limits the maximum temperature rise to 325°F (163°C) above its initial temperature through the penetration on the non-fire side when tested in accordance with ASTM E 814.



“T” RATING


UL/cUL SYSTEM NO. F-A-1105
METAL PIPE THROUGH CONCRETE FLOOR ASSEMBLY
F-RATING = 2-HR.
T-RATING = 2-HR.
L-RATING AT AMBIENT = LESS THAN 1 CFM / SQ FT
L-RATING AT 400°F = 4 CFM / SQ FT
W-RATING = CLASS I (SEE NOTE NO. 4 BELOW)
TOP VIEW
SECTION A-A
FA1105e.010715
A
A
1
2
3
4
5
12"
24" OR 36" (SEE ITEM 5)


OCT 26

UL 1479: AIR LEAKAGE RATING

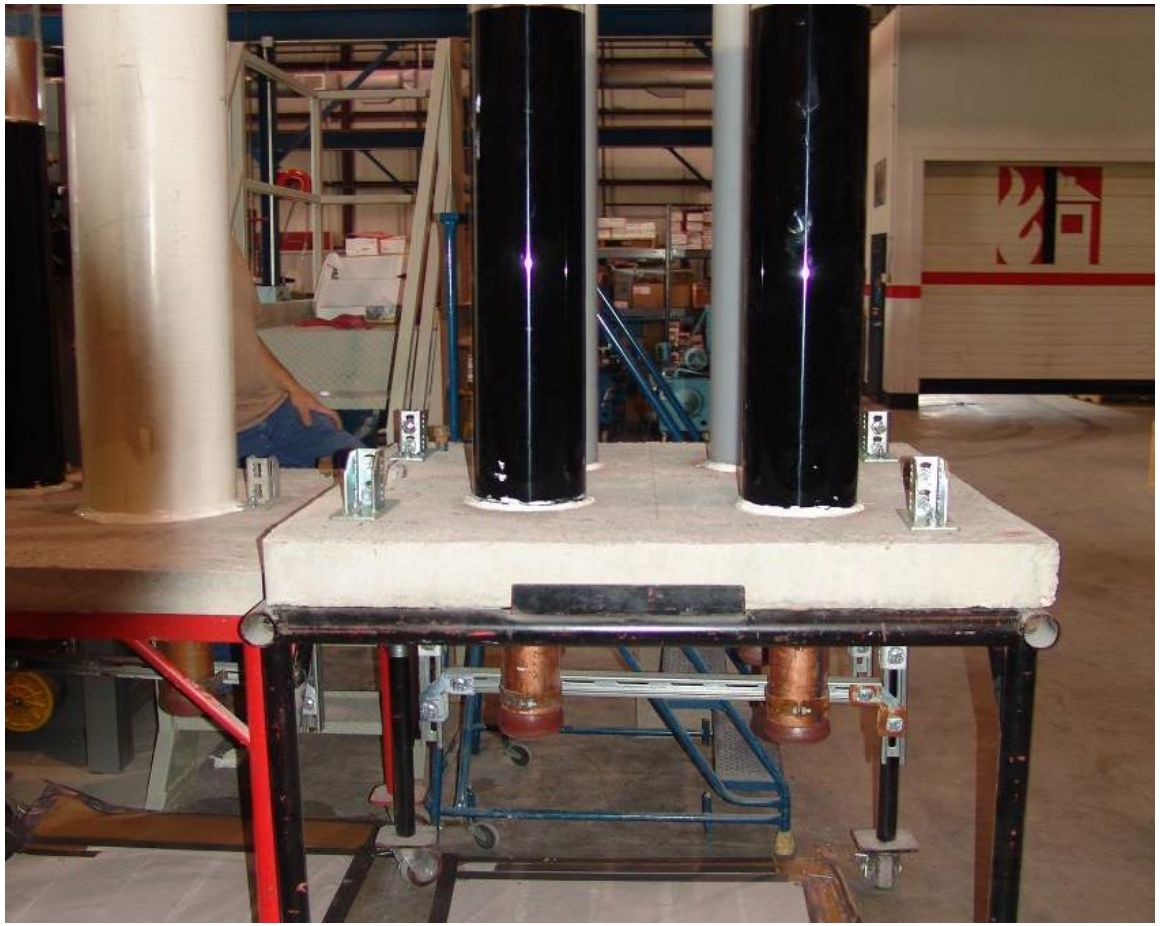
L-Rating

- Measures amount of air leakage through the firestop system
- Tested at ambient and 400°F
- Measured in CFM - the lower the number, the better

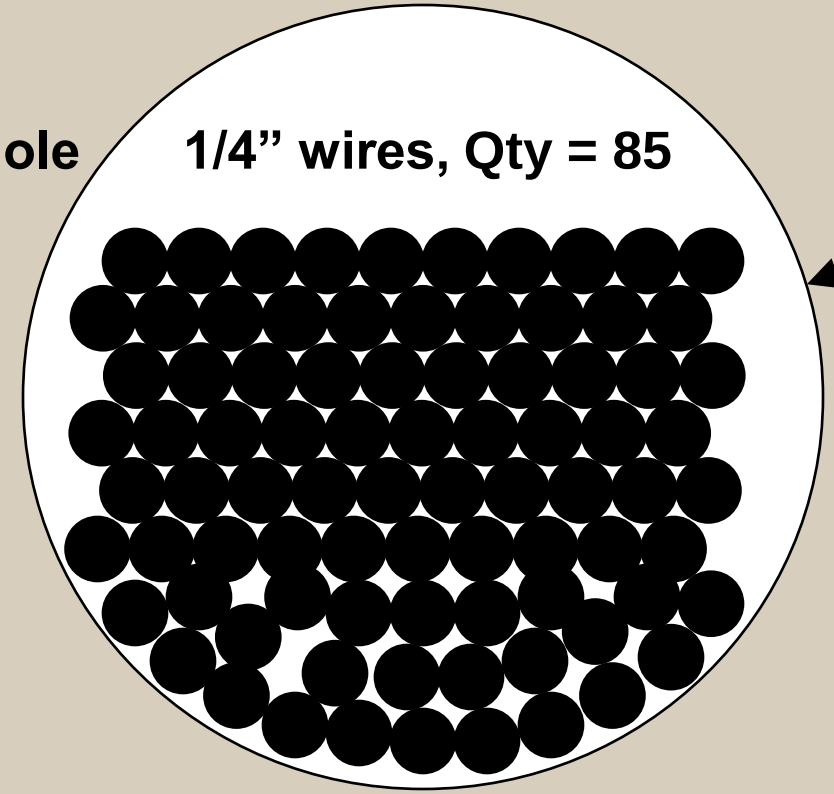
UL 1479: WATER LEAKAGE RATING

W-Rating

- Determines effectiveness of a firestop system to restrict flow of water
- Tested to resist up to 3 feet of water column for 72 hours
- Fully fire-tested after water exposure - must perform as well as non water-tested assembly



CALCULATING %FILL
(PER UL NOMENCLATURE)



Appears to be about 2/3 full

$(A_o)=3.14 \times (2^2)=12.56\ in^2$

$(A_w)=[3.14 \times (.125^2)] \times 85= 4.17\ in^2$

$(\%_f)=(4.17/12.56) \times 100 =$ 33.2%

Actual % fill

Actual % fill rates are roughly 50-60% of what they visually appear to be

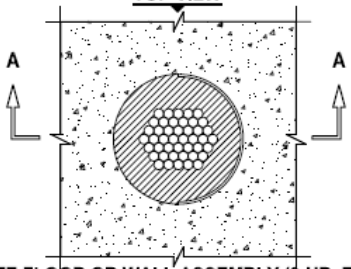
UL/cUL SYSTEM NO. C-AJ-3095

CABLE BUNDLE THROUGH CONCRETE FLOOR/WALL OR BLOCK WALL ASSEMBLY

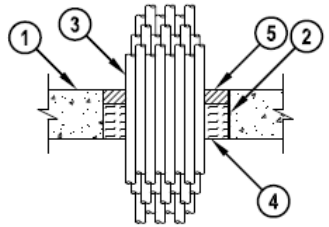
F-RATING = 3-HR.
T-RATING = 0-HR, 1/2-HR, & 3/4-HR.
(SEE UL FIRE RESISTANCE DIRECTORY VOL. 2)

CAJ3095r.010515

TOP VIEW



SECTION A-A



1. CONCRETE FLOOR OR WALL ASSEMBLY (3-HR. FIRE-RATING) :
   A. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR (MINIMUM 2-1/2" THICK).
   B. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE WALL (MINIMUM 3" THICK).
   C. ANY UL/cUL CLASSIFIED CONCRETE BLOCK WALL.
2. [OPTIONAL] MAXIMUM 6" NOMINAL DIAMETER STEEL PIPE SLEEVE (SCHEDULE 10 OR HEAVIER) MAY EXTEND MAXIMUM 3" ABOVE FLOOR, OR BOTH SURFACES OF WALL.
3. CABLE BUNDLE TO BE A COMBINATION OF ANY OF THE FOLLOWING :
   A. MAXIMUM 300 PAIR NO. 24 AWG TELEPHONE CABLE WITH PVC JACKET.

2. CABLES TO FILL MINIMUM 25%, TO MAXIMUM 45%

   I. MAXIMUM 3/C NO. 6 AWG CABLE WITH PVC JACKET.
   J. MAXIMUM 1/4" DIAMETER SINGLE OR MULTIPLE CONDUCTOR TYPE MI CABLE (SEE NOTE NO. 4 BELOW).
   K. ANY CABLE, METAL-CLAD CABLES, OR ARMORED CABLES CURRENTLY LISTED UNDER THE THROUGH PENETRATING PRODUCTS CATEGORY.
4. MINIMUM 2" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) TIGHTLY PACKED.
5. MINIMUM 1/2" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 6".
2. CABLES TO FILL MINIMUM 25%, TO MAXIMUM 45% OF CROSS-SECTIONAL AREA OF OPENING.
3. MINIMUM 1/2" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT IS REQUIRED ON BOTH SIDES OF A WALL.
4. A MINIMUM 1/8" SEPARATION SHOULD BE MAINTAINED BETWEEN MI CABLES AND ANY OTHER TYPES OF CABLE.

Hilti Firestop Systems

HILTI, Inc.
Tulsa, Oklahoma USA (800) 879-8000

Sheet	1 of 1
Scale	5/32" = 1"
Date	Jan. 05, 2015

Drawing No. CAJ 3095r

Saving Lives through Innovation and Education

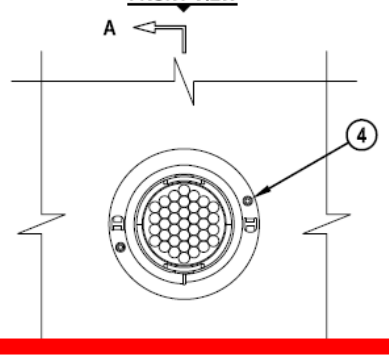
UL/cUL SYSTEM NO. W-L-3335

CABLE BUNDLE THROUGH GYPSUM WALL ASSEMBLY

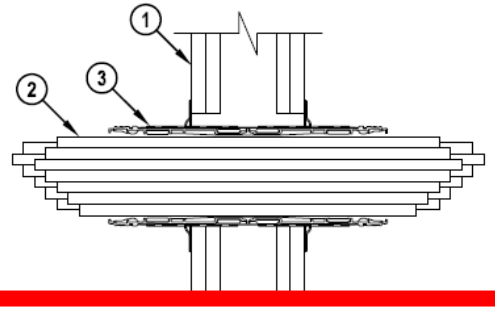
F-RATING = 1-HR. OR 2-HR.
T-RATING = 0-HR., 1/2-HR., OR 1-HR.
L-RATING AT AMBIENT = SEE TABLE
L-RATING AT 400°F = SEE TABLE

WL3335h.010716

FRONT VIEW



SECTION A-A



1. GYPSUM WALL ASSEMBLY (UL/cUL CLASSIFIED U300, U400 OR V400 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN) TO INCLUDE THE FOLLOWING CONSTRUCTION FEATURES :
   A. [NOT SHOWN] WOOD STUDS TO CONSIST OF NOMINAL 2" x 4" LUMBER (SPACED MAXIMUM 16" OC). STEEL STUDS TO BE MINIMUM 2-1/2" WIDE [WHEN 5/8" THICK GYPSUM WALLBOARD IS USED] AND MINIMUM 3-1/2" WIDE [WHEN 3/4" THICK GYPSUM WALLBOARD IS USED] (SPACED MAXIMUM 24" OC).
   B. NOMINAL 5/8" THICK GYPSUM WALLBOARD. TYPE, NUMBER OF LAYERS, AND SHEET ORIENTATION AS SPECIFIED IN THE INDIVIDUAL UL DESIGN (MINIMUM ONE LAYER 3/4" THICK GYPSUM WALLBOARD MAY BE USED).
2. CABLE BUNDLE TO BE A COMBINATION OF ANY OF THE FOLLOWING ;
   A. MAXIMUM 100 PAIR NO. 24 AWG TELEPHONE CABLE WITH PVC JACKET.
   B. MAXIMUM 7/C NO. 12 AWG COPPER CONDUCTOR CONTROL CABLE WITH PVC OR XLPE JACKET AND INSULATION.
   C. MAXIMUM 4/0 AWG TYPE RHH GROUND CABLE.

Hilti Firestop Systems	HILTI, Inc. Plano, Texas USA (800) 879-8000	Sheet 1 of 2	Drawing No. WL 3335h
		Scale 3/16" = 1"	
		Date Jan. 07, 2016	

Saving Lives through Innovation and Education

UL/cUL SYSTEM NO. W-L-3335

CABLE BUNDLE THROUGH GYPSUM WALL ASSEMBLY

F-RATING = 1-HR. OR 2-HR.
T-RATING = 0-HR., 1/2-HR., OR 1-HR.
L-RATING AT AMBIENT = SEE TABLE
L-RATING AT 400°F = SEE TABLE

WL3335h.010716

D. MAXIMUM 4 PAIR NO. 22 AWG CAT 5 OR CAT 6 COMPUTER CABLE.
E. MAXIMUM RG 6/U COAXIAL CABLE.
F. MAXIMUM 1/2" DIAMETER FIBER-OPTIC CABLE (24 FIBER) WITH PVC OR PE JACKET AND INSULATION.
G. MAXIMUM 20/C NO. 22 AWG SHIELDED PRINTER CABLE WITH PVC JACKET.
H. MAXIMUM 2/C NO. 18 AWG POWER OR NON-POWER LIMITED FIRE ALARM CABLE WITH OR WITHOUT METAL JACKET (MANUFACTURED BY AFC CABLE SYSTEMS, INC.).
I. MAXIMUM 1/4" DIAMETER S-VIDEO CABLE CONSISTING OF TWO MAXIMUM 24 AWG 75 OHM COAX OR TWISTED PAIR CABLE WITH PE INSULATION AND PVC JACKET.
J. MAXIMUM 3/C NO. 12 AWG METAL CLAD CABLE.
K. ANY CABLES, METAL-CLAD CABLES, OR ARMORED CABLES CURRENTLY LISTED UNDER THE THROUGH PENETRATING PRODUCTS CATEGORY.

3. HILTI CP 653 (BA) SPEED SLEEVE (2" OR 4") SLID INTO AND CENTERED WITHIN WALL. DEVICE FLANGES

2. CABLES MAY REPRESENT 0% TO 100% VISUAL FILL OF DEVICE.

CABLE FILL	CABLE TYPE	AMBIENT		400°F		AMBIENT		400°F	
		SEALANT	GASKET	SEALANT	GASKET	SEALANT	GASKET	SEALANT	GASKET
0% FILL	-	LESS THAN 1	1	LESS THAN 1	2.7	LESS THAN 1	LESS THAN 1	LESS THAN 1	LESS THAN 1
100%	ITEM 2D ONLY	4.9	4.9	1.3	3.5	LESS THAN 1	LESS THAN 1	LESS THAN 1	LESS THAN 1
100%	ANY CABLES (ITEM 2) IN ANY COMBINATION	9.2	9.2	9.6	11.8	1.2	1.2	1.3	1.6

NOTES:
1. MAXIMUM DIAMETER OF OPENING = 6" (FOR 6" DEVICE) OR 5" (FOR 4" DEVICE).
2. CABLES MAY REPRESENT 0% TO 100% VISUAL FILL OF DEVICE.
3. ANNULAR SPACE BETWEEN DEVICE AND PERIPHERY OF OPENING = MINIMUM 0".
4. L-RATING APPLIES ONLY WHEN HILTI FS-ONE MAX OR FS-ONE OR CP 606 FIRESTOP SEALANT IS USED AND INNER FABRIC SEAL IS TWISTED CLOSED.
5. [OPTIONAL] INNER FABRIC MAY REMAIN OPEN WHEN L-RATING IS NOT REQUIRED.
6. [OPTIONAL] AS AN ALTERNATE TO SMOKE GASKET, MINIMUM 5/8" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT, HILTI CP 606 FLEXIBLE FIRESTOP SEALANT, OR HILTI CP 618 FIRESTOP PUTTY STICK FLUSH WITH BOTH SURFACES OF WALL WITH AN ADDITIONAL 1/4" BEAD OF FIRESTOP SEALANT (NOT REQUIRED FOR PUTTY) APPLIED AT POINT OF CONTACT.

Hilti Firestop Systems	HILTI, Inc. Plano, Texas USA (800) 879-8000	Sheet 2 of 2	Drawing No. WL 3335h
		Scale -	
		Date Jan. 07, 2016	

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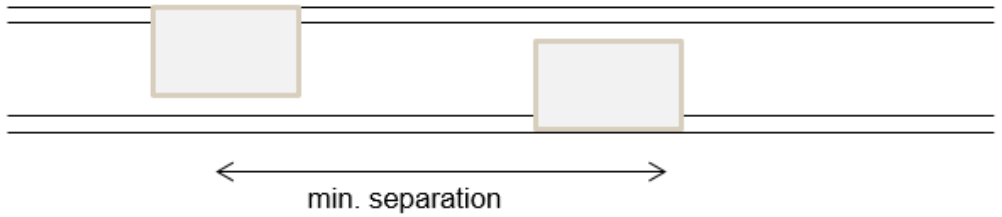
CABLE TRAY BEST PRACTICE

2015 IBC 714.3.2: MEMBRANE PENETRATIONS FIRESTOP SYSTEMS TESTED TO ASTM E 814 / UL 1479

Recessed fixtures shall be installed such that the required fire resistance will not be reduced.

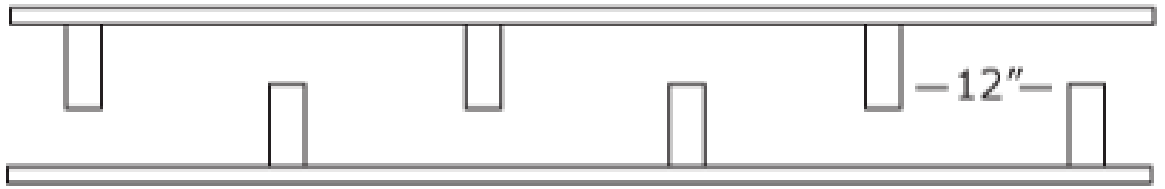
- Sum total area of openings does not exceed 100 square inches for any 100 sq. ft. of wall
- Steel electrical boxes on opposite sides of wall should be separated by a horizontal distance > 24 inches



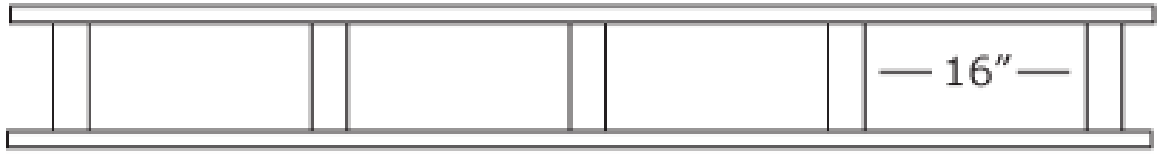
- Steel boxes outside these parameters must be protected

ELECTRICAL BOXES - STUD ORIENTATION

Staggered Stud (communicating stud cavities)



Conventional (non-communicating stud cavities)



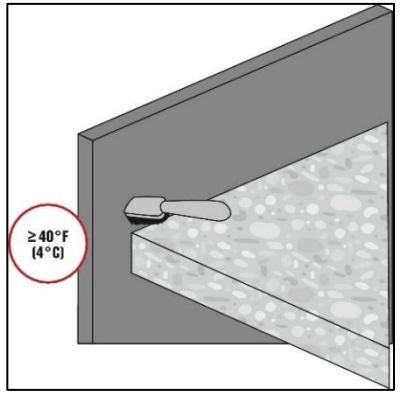
FACTORS THAT AFFECT JOINT FIRE PERFORMANCE

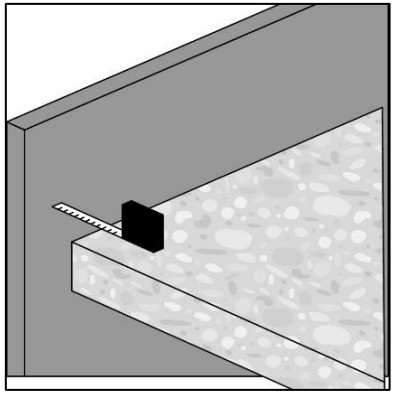
Joints

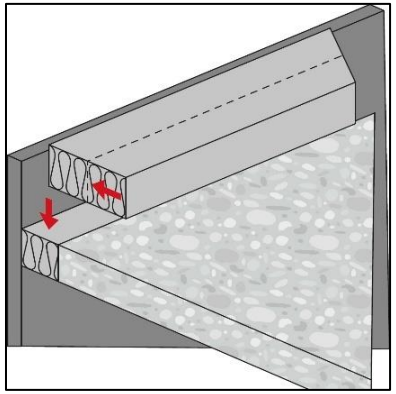
- Joint width
- Desired assembly rating (hrs.)
- Floor or wall construction type and thickness
- Movement requirements (%)
- Stud width for gypsum walls
- Firestop products used

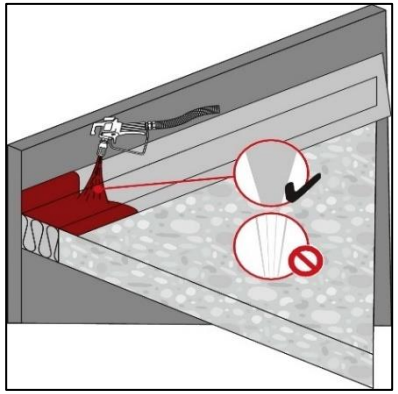
PROPER INSTALLATION OF JOINT SPRAY

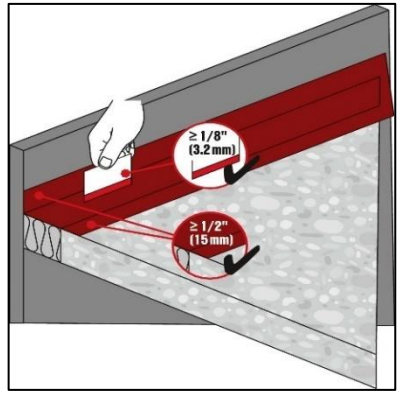
System Selection	Cleaning	Joint Width	Backing Material	Apply Spray	Verifty Correct Installation
Always refer to appropriate UL listed firestop assembly or HILTI manufacturer‘s Engineering Judgment for complete installation information.	Clean the opening. Surfaces to which sealant will be applied should be cleaned of loose debris, dirt, oil, wax, and grease. The surface should be moisture & frost free.	Properly measure the joint to find the maximum joint width. Ensure max joint width is less than or equal to max joint width on UL system or Engineering Judgment.	Calculate required thickness of mineral wool required to meet the minimum compression % per UL system or Engineering Judgement	Apply firestop spray over mineral wool (min. 1/8“ wet thckness). Overlap on to both substrates (check UL listing)	1/8“ wet thickness will dry to 1/16“. Verify that no mineral wool is exposed.











COMMON JOINT TYPES

Head of wall

Curtain Wall

Wall to wall

Joint firestop systems installed per ASTM 1966 standards.

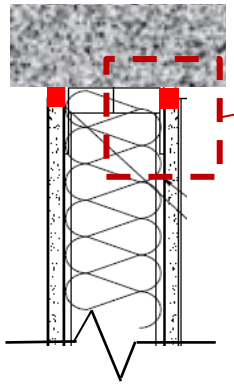
IBC SECTION 715.3: JOINT FIRESTOP SYSTEMS TESTED TO ASTM E 1966 / UL 2079

Assembly Rating

Measures fire and **temperature** on the non-fire side of the joint

Hose stream required for top-of-wall and wall-to-wall joints

Joint undergoes cyclic testing prior to fire testing



A revised UL 2079 5th test edition came into effect on August 26, 2017 affects pre-formed firestop devices

T RATING MUST EQUAL F RATING

UL/cUL SYSTEM NO. HW-D-1058

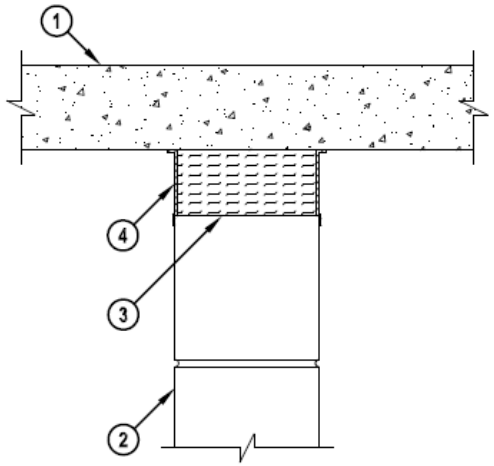
FIRE-RATED JOINT THROUGH CONCRETE WALL OR BLOCK WALL ASSEMBLY

ASSEMBLY RATING = 3-HR.

CLASS II MOVEMENT CAPABILITIES - 25% COMPRESSION OR EXTENSION

CROSS-SECTIONAL VIEW

HWD1058b.052510



1. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR ASSEMBLY (MINIMUM 4-1/2" THICK) (3-HR. FIRE-RATING).
2. CONCRETE WALL ASSEMBLY (3-HR. FIRE-RATING):
   A. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE WALL (MINIMUM 8" THICK).
   B. ANY UL/cUL CLASSIFIED CONCRETE BLOCK WALL ASSEMBLY.
3. MINIMUM 8" THICKNESS MINERAL WOOL (MINIMUM 4 PCF DENSITY) COMPRESSED 50%.
4. MINIMUM 1/8" (WET) THICKNESS HILTI CFS-SP WB FIRESTOP JOINT SPRAY OR HILTI CP 672 SPEED SPRAY APPLIED WITHIN THE JOINT, FLUSH WITH EACH SURFACE OF WALL AND OVERLAPPING MINIMUM 1/2" ONTO FLOOR AND WALL ON BOTH SIDES OF JOINT.

NOTE : MAXIMUM WIDTH OF JOINT = 3-1/4".

Hilti Firestop Systems	HILTI, Inc. Tulsa, Oklahoma USA (800) 879-8000	Sheet 1 of 1 Scale 5/32" = 1" Date May 25, 2010	Drawing No. HWD 1058b

Saving Lives through Innovation and Education

UL/cUL SYSTEM NO. HW-D-1058

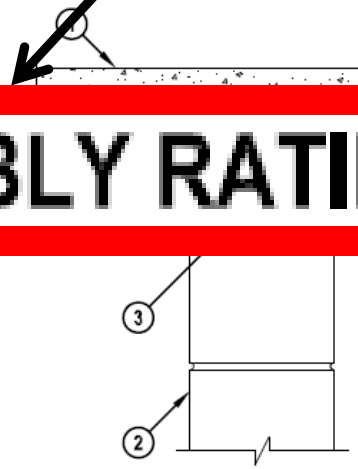
FIRE-RATED JOINT THROUGH CONCRETE WALL OR BLOCK WALL ASSEMBLY

ASSEMBLY RATING = 3-HR.

CLASS II MOVEMENT CAPABILITIES - 25% COMPRESSION OR EXTENSION

CROSS-SECTIONAL VIEW

HWD1058b.052510



ASSEMBLY RATING = 3-HR.

1. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR ASSEMBLY (MINIMUM 4-1/2" THICK) (3-HR. FIRE-RATING).
2. CONCRETE WALL ASSEMBLY (3-HR. FIRE-RATING):
   A. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE WALL (MINIMUM 8" THICK).
   B. ANY UL/cUL CLASSIFIED CONCRETE BLOCK WALL ASSEMBLY.
3. MINIMUM 8" THICKNESS MINERAL WOOL (MINIMUM 4 PCF DENSITY) COMPRESSED 50%.
4. MINIMUM 1/8" (WET) THICKNESS HILTI CFS-SP WB FIRESTOP JOINT SPRAY OR HILTI CP 672 SPEED SPRAY APPLIED WITHIN THE JOINT, FLUSH WITH EACH SURFACE OF WALL AND OVERLAPPING MINIMUM 1/2" ONTO FLOOR AND WALL ON BOTH SIDES OF JOINT.

NOTE : MAXIMUM WIDTH OF JOINT = 3-1/4".

Hilti Firestop Systems	HILTI, Inc. Tulsa, Oklahoma USA (800) 879-8000	Sheet 1 of 1 Scale 5/32" = 1" Date May 25, 2010	Drawing No. HWD 1058b

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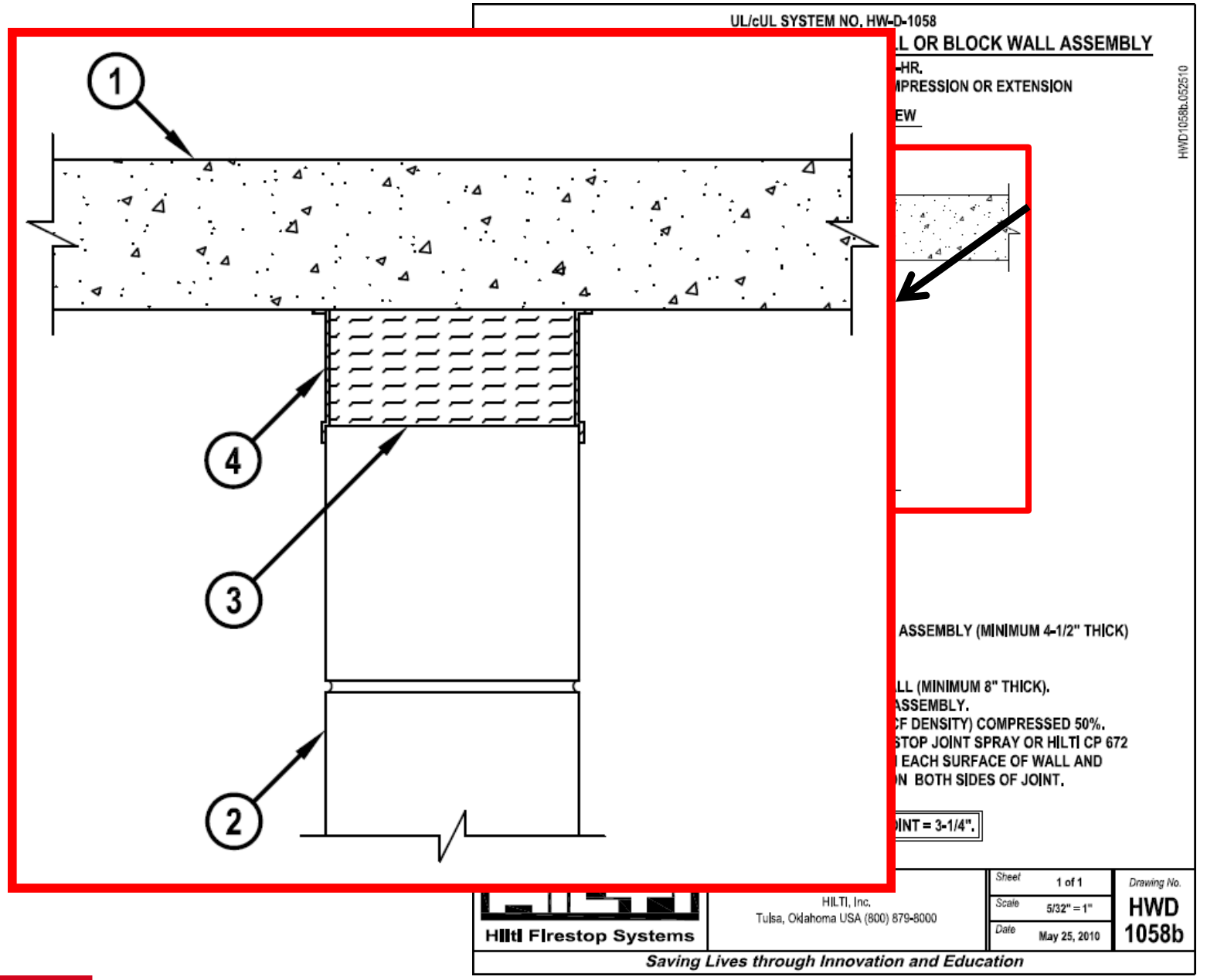

UL/cUL SYSTEM NO. HW-D-1058
L OR BLOCK WALL ASSEMBLY
-HR.
MPRESSION OR EXTENSION
EW
HWD1058b.052510
1
4
3
2
ASSEMBLY (MINIMUM 4-1/2" THICK)
LL (MINIMUM 8" THICK).
ASSEMBLY.
CF DENSITY) COMPRESSED 50%.
STOP JOINT SPRAY OR HILTI CP 672
EACH SURFACE OF WALL AND
N BOTH SIDES OF JOINT.
INT = 3-1/4".
Hilti Firestop Systems
HILTI, Inc.
Tulsa, Oklahoma USA (800) 879-8000
Sheet 1 of 1
Scale 5/32" = 1"
Date May 25, 2010
Drawing No.
HWD 1058b
Saving Lives through Innovation and Education

UL/cUL SYSTEM NO. HW-D-1058

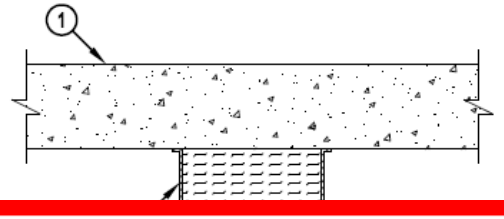
FIRE-RATED JOINT THROUGH CONCRETE WALL OR BLOCK WALL ASSEMBLY

ASSEMBLY RATING = 3-HR.

CLASS II MOVEMENT CAPABILITIES - 25% COMPRESSION OR EXTENSION

CROSS-SECTIONAL VIEW

HWD1058b.052510



1. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR ASSEMBLY (MINIMUM 4-1/2" THICK) (3-HR. FIRE-RATING).

2. CONCRETE WALL ASSEMBLY (3-HR. FIRE-RATING):

A. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE WALL (MINIMUM 8" THICK).

B. ANY UL/cUL CLASSIFIED CONCRETE BLOCK WALL ASSEMBLY.

1. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR ASSEMBLY (MINIMUM 4-1/2" THICK) (3-HR. FIRE-RATING).
2. CONCRETE WALL ASSEMBLY (3-HR. FIRE-RATING):
A. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE WALL (MINIMUM 8" THICK).
B. ANY UL/cUL CLASSIFIED CONCRETE BLOCK WALL ASSEMBLY.

3. MINIMUM 6" THICKNESS MINERAL WOOL (MINIMUM 4 PCF DENSITY) COMPRESSED 50%.

4. MINIMUM 1/8" (WET) THICKNESS HILTI CFS-SP WB FIRESTOP JOINT SPRAY OR HILTI CP 672 SPEED SPRAY APPLIED WITHIN THE JOINT, FLUSH WITH EACH SURFACE OF WALL AND OVERLAPPING MINIMUM 1/2" ONTO FLOOR AND WALL ON BOTH SIDES OF JOINT.

NOTE : MAXIMUM WIDTH OF JOINT = 3-1/4".

Hilti Firestop Systems

HILTI, Inc.
Tulsa, Oklahoma USA (800) 879-8000

Sheet	1 of 1
Scale	5/32" = 1"
Date	May 25, 2010
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UL/cUL SYSTEM NO. HW-D-1058

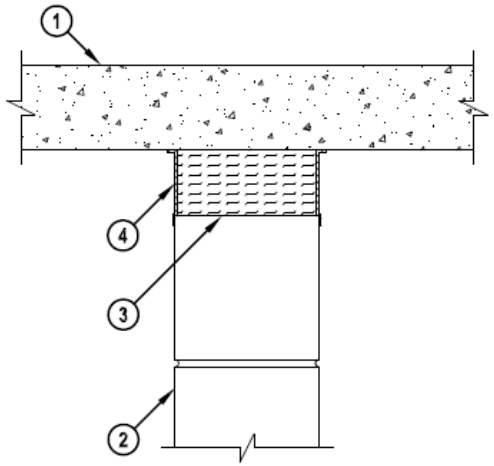
FIRE-RATED JOINT THROUGH CONCRETE WALL OR BLOCK WALL ASSEMBLY

ASSEMBLY RATING = 3-HR.

CLASS II MOVEMENT CAPABILITIES - 25% COMPRESSION OR EXTENSION

CROSS-SECTIONAL VIEW

HWD1058b.052510



1. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR ASSEMBLY (MINIMUM 4-1/2" THICK)

NOTE : MAXIMUM WIDTH OF JOINT = 3-1/4".

MINIMUM 1/8" (WET) THICKNESS HILTI CFS-SP WB FIRESTOP JOINT SPRAY OR HILTI CP 672 SPEED SPRAY APPLIED WITHIN THE JOINT, FLUSH WITH EACH SURFACE OF WALL AND OVERLAPPING MINIMUM 1/2" ONTO FLOOR AND WALL ON BOTH SIDES OF JOINT.

NOTE : MAXIMUM WIDTH OF JOINT = 3-1/4".

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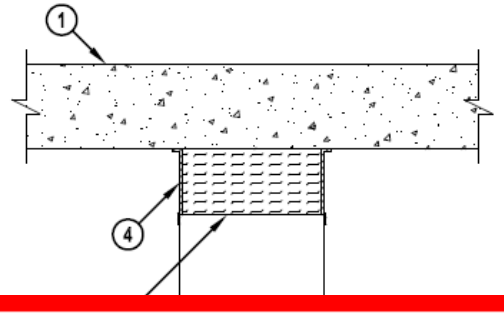
FIRE-RATED JOINT THROUGH CONCRETE WALL OR BLOCK WALL ASSEMBLY

ASSEMBLY RATING = 3-HR.

CLASS II MOVEMENT CAPABILITIES - 25% COMPRESSION OR EXTENSION

CROSS-SECTIONAL VIEW

HWD1058b.052510



3. MINIMUM 8" THICKNESS MINERAL WOOL (MINIMUM 4 PCF DENSITY) COMPRESSED 50%.
4. MINIMUM 1/8" (WET) THICKNESS HILTI CFS-SP WB FIRESTOP JOINT SPRAY OR HILTI CP 672 SPEED SPRAY APPLIED WITHIN THE JOINT, FLUSH WITH EACH SURFACE OF WALL AND OVERLAPPING MINIMUM 1/2" ONTO FLOOR AND WALL ON BOTH SIDES OF JOINT.

1. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR ASSEMBLY (MINIMUM 4-1/2" THICK) (3-HR. FIRE-RATING).
2. CONCRETE WALL ASSEMBLY (3-HR. FIRE-RATING):
   A. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE WALL (MINIMUM 8" THICK).
   B. ANY UL/cUL CLASSIFIED CONCRETE BLOCK WALL ASSEMBLY
3. MINIMUM 8" THICKNESS MINERAL WOOL (MINIMUM 4 PCF DENSITY) COMPRESSED 50%.
4. MINIMUM 1/8" (WET) THICKNESS HILTI CFS-SP WB FIRESTOP JOINT SPRAY OR HILTI CP 672 SPEED SPRAY APPLIED WITHIN THE JOINT, FLUSH WITH EACH SURFACE OF WALL AND OVERLAPPING MINIMUM 1/2" ONTO FLOOR AND WALL ON BOTH SIDES OF JOINT.

NOTE : MAXIMUM WIDTH OF JOINT = 3-1/4".

Hilti Firestop Systems

HILTI, Inc.
Tulsa, Oklahoma USA (800) 879-8000

Sheet	1 of 1
Scale	5/32" = 1"
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Drawing No. HWD 1058b

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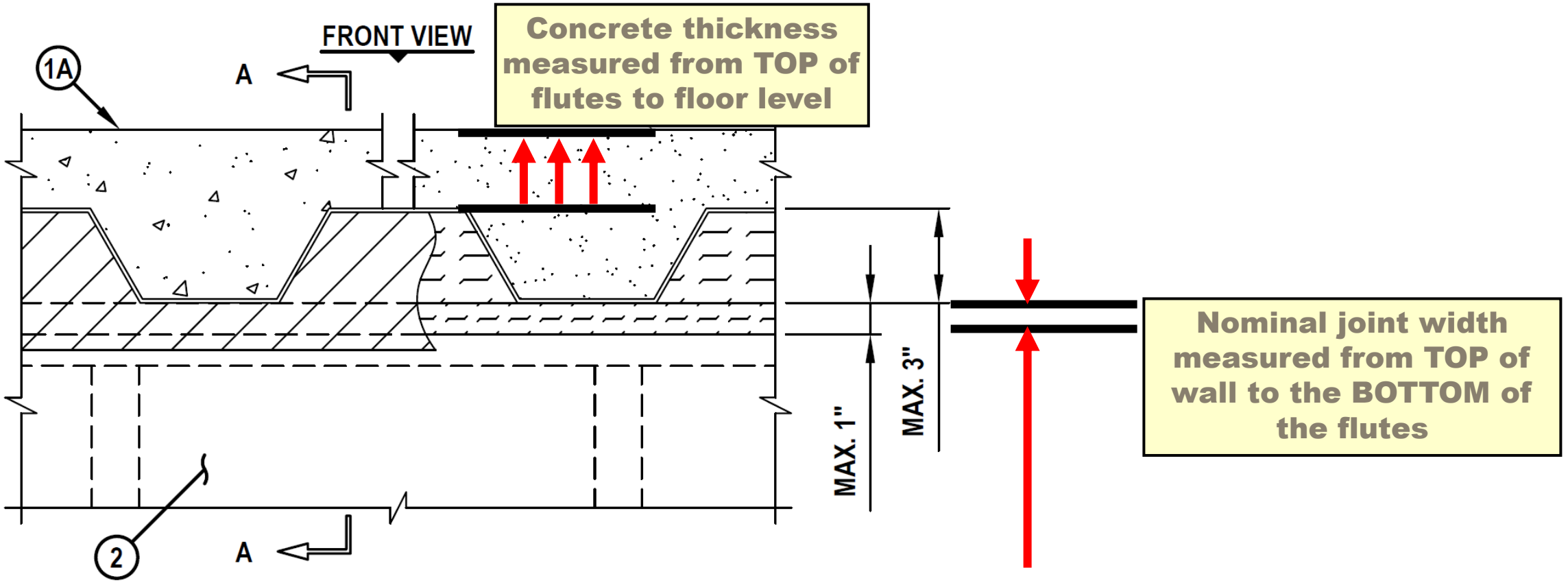
MEASURING WIDTHS & THICKNESSES

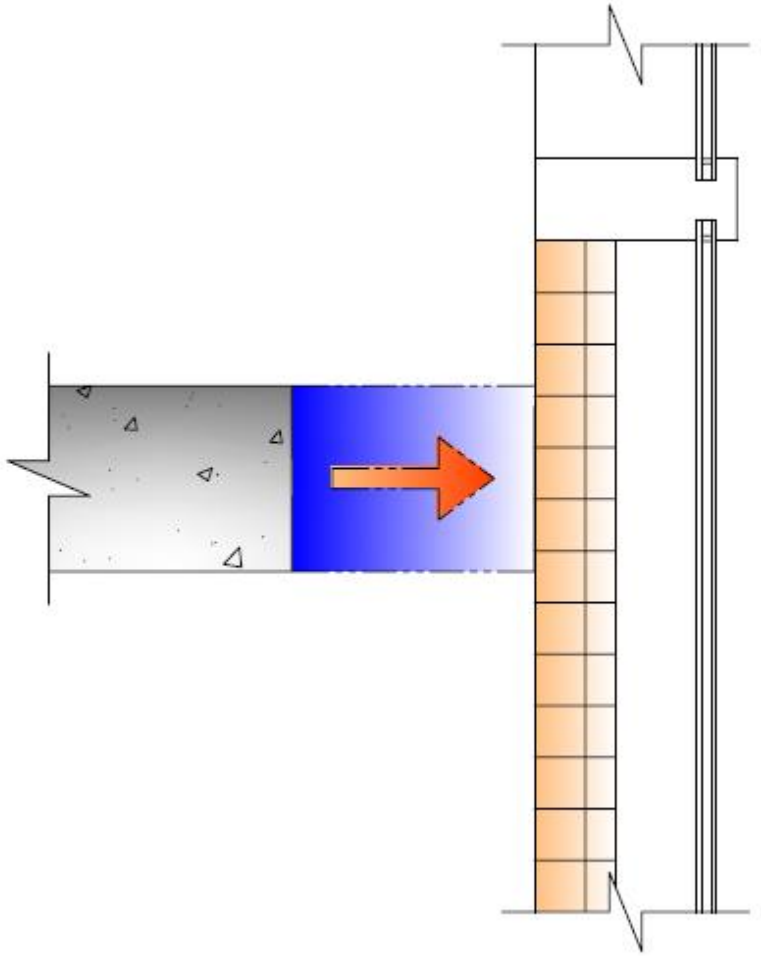


FIRESTOPPING CURTAIN WALL

“CURTAIN WALL FIRESTOPPING” = “PERIMETER BARRIER FIRE CONTAINMENT”

- Floor slabs are supported by interior beams and columns, CW itself attached to slab

- Gap ranges typically from a few inches to up to 12 inches between each floor and exterior curtain wall



AGENDA

Consequences of Fires

What is Firestop?

Fire Incident Examples

Fire Safe Building Construction & Code Requirements

Firestop System Testing

Selecting Firestop Systems

Firestop Installation Examples

UL SYSTEM NOMENCLATURE

Penetrations

F = Floors
W = Walls
C = Floors or walls (Combined)

A.	Concrete floors 5 inches thick or less
B.	Concrete floors greater than 5 inches thick
C.	Framed floors – Floor/Ceiling assemblies
D.	Steel deck construction
E.	Floor-ceiling assemblies consisting of concrete w/ membrane protection
J.	Concrete or masonry walls 8 inches thick or less
K.	Concrete walls greater than 8 inches thick
L.	**Framed walls – gypsum wallboard assemblies**
M.	Bulkheads

<u>The four digit number describes the penetration item(s)</u>

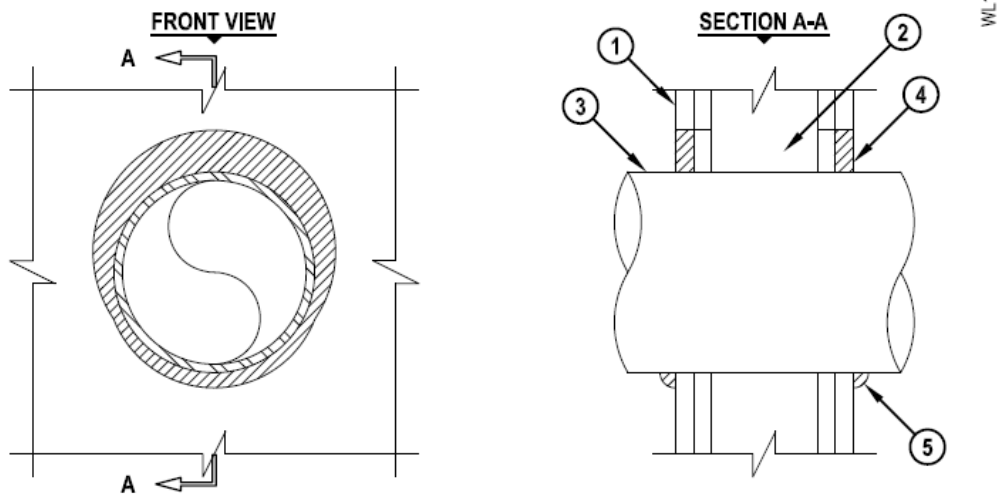
0000 - 0999	Blank openings
1000 - 1999	**Metal pipe, conduit or tubing**
2000 - 2999	Non-metallic pipe conduit or tubing
3000 - 3999	Cables
4000 - 4999	Cable trays
5000 - 5999	Insulated pipes 8" or less
6000 - 6999	Miscellaneous electrical (busway)
7000 - 7999	Miscellaneous mechanical
8000 - 8999	Mixed penetrating items

UL/cUL SYSTEM NO. W-L-1054

METAL PIPE THROUGH GYPSUM WALL ASSEMBLY

F-RATING = 1-HR. OR 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

WL1054s.011015



1. GYPSUM WALL ASSEMBLY (UL/cUL CLASSIFIED U300 OR U400 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
2. [NOT SHOWN] WOOD STUDS TO CONSIST OF NOMINAL 2" x 4" LUMBER. STEEL STUDS TO BE MINIMUM 2-1/2" WIDE.
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 30" DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
   B. MAXIMUM 30" DIAMETER CAST IRON PIPE.
   C. MAXIMUM 6" NOMINAL DIAMETER COPPER PIPE.
   D. MAXIMUM 6" NOMINAL DIAMETER STEEL CONDUIT.
   E. MAXIMUM 4" NOMINAL DIAMETER EMT.
4. MINIMUM 5/8" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT.
5. MINIMUM 1/2" BEAD HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING :
A. 32-1/4" FOR STEEL STUD WALLS.
B. 14-1/2" FOR WOOD STUD WALLS.
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 2-1/4".
3. PIPE MAY BE INSTALLED WITH CONTINUOUS POINT OF CONTACT.
4. PIPE MAY BE INSTALLED AT AN ANGLE NOT GREATER THAN 45° FROM PERPENDICULAR.

HILTI
Hilti Firestop Systems

HILTI, Inc.
Tulsa, Oklahoma USA (800) 879-8000

Sheet	1 of 1
Scale	7/32" = 1"
Date	Jan. 10, 2015

Drawing No.
WL 1054s

UL SYSTEM NOMENCLATURE

Joints

FF = Floor-to-Floor
WW = Wall-to-Wall
FW = Floor-to-Wall
HW = Head-to- Wall
CG = Wall-to-Wall Joints intended as corner guards
CW = Curtain wall (perimeter fire barrier system)

The third letter signifies the movement capabilities of the joint system

S = No movement (Static))
D = Allows movement (Dynamic)

The four digit number describes maximum nominal joint width

0000 - 0999 Less than or equal to 2”
1000 - 1999 Greater than 2” and less than or equal to 6”
2000 - 2999 Greater than 6” and less than or equal to 12”
3000 - 3999 Greater than 12” and less than or equal to 24”

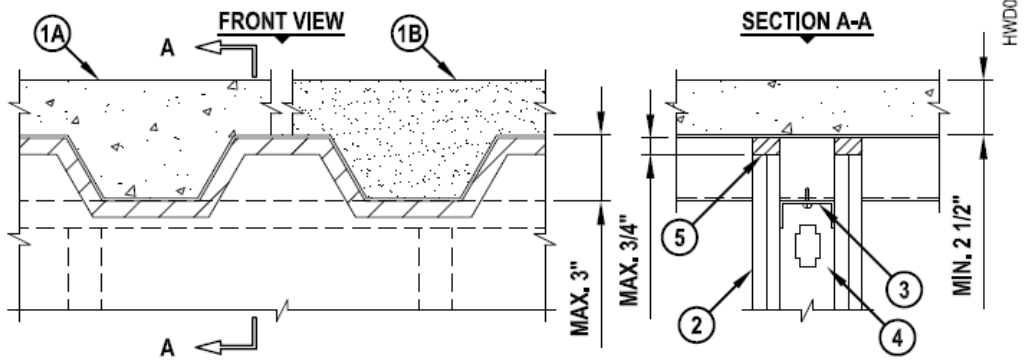
4000-4999 Greater than 24”

UL/cUL SYSTEM NO. HW-D-0077

TOP OF WALL JOINT : GYPSUM WALL ASSEMBLY

ASSEMBLY RATING = 1-HR. OR 2-HR.
CLASS II MOVEMENT CAPABILITIES = 17% COMPRESSION OR EXTENSION
L-RATING AT AMBIENT = LESS THAN 1 CFM/LIN FT
L-RATING AT 400°F = LESS THAN 1 CFM/LIN FT

HWD0077m.022610



1. FLOOR OR ROOF ASSEMBLY (1-HR. OR 2-HR. FIRE-RATING) :
   A. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR (MIN. 2-1/2" THICK) OVER METAL DECKING (UL/cUL CLASSIFIED D700 OR D900 SERIES).
   B. INSULATING CONCRETE (MIN. 2-1/4" THICK) OVER METAL DECKING (UL/cUL CLASSIFIED P900 SERIES).
   C. [NOT SHOWN] FLUTED STEEL ROOF DECK WITH SPRAY-APPLIED FIREPROOFING (UL/cUL CLASSIFIED P700 SERIES).
2. GYPSUM WALL ASSEMBLY (UL/cUL CLASSIFIED U400 OR V400 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
3. CEILING RUNNER (MIN. 25 GA., FLANGE HEIGHT OF CEILING RUNNER SHALL BE MINIMUM 1/4" GREATER THAN MAXIMUM EXTENDED JOINT WIDTH) FASTENED TO UNDERSIDE OF THE DECK WITH STEEL MASONRY ANCHORS, STEEL FASTENERS, OR WELDS (SPACED MAX. 24" O.C.) (SEE NOTE NO. 2 BELOW).
4. STEEL STUDS (MIN. 2-1/2" WIDE), CUT 1/2" TO 3/4" LESS IN LENGTH THAN ASSEMBLY HEIGHT, NESTING IN CEILING RUNNER WITHOUT ATTACHMENT.
5. HILTI CP 606 FLEXIBLE FIRESTOP SEALANT :
   A. MINIMUM 5/8" DEPTH ON BOTH SIDES OF WALL, FOR A 1-HR. FIRE-RATING.
   B. MINIMUM 1-1/4" DEPTH ON BOTH SIDES OF WALL, FOR A 2-HR. FIRE-RATING.

NOTES : 1. STEEL FLOOR UNITS MAY BE SPRAYED WITH A MINIMUM 5/16" THICKNESS TO MAXIMUM 11/16" THICKNESS OF UL CLASSIFIED MONOKOTE TYPE MK-6/HY FIREPROOFING MANUFACTURED BY W.R. GRACE PRIOR TO OR AFTER THE INSTALLATION OF CEILING RUNNERS.
2. AS AN ALTERNATE TO CEILING RUNNER IN ITEM NO. 3, CEILING RUNNERS, MANUFACTURED BY BRADY CONSTRUCTION INNOVATIONS, INC., DBA SLIPTRACK SYSTEMS, METAL-LITE, INC., TOTAL STEEL SOLUTIONS, THE STEEL NETWORK, INC., CEMCO, CLARKWESTERN BUILDING SYSTEMS, INC., SCAFCO, OR OLMAR SUPPLY, INC., MAY BE USED. WHEN ALTERNATE CEILING TRACKS ARE USED, CONSULT THE UL FIRE RESISTANCE DIRECTORY FOR INSTALLATION INSTRUCTIONS.

Hilti Firestop Systems

HILTI, Inc.
Tulsa, Oklahoma USA (800) 879-8000

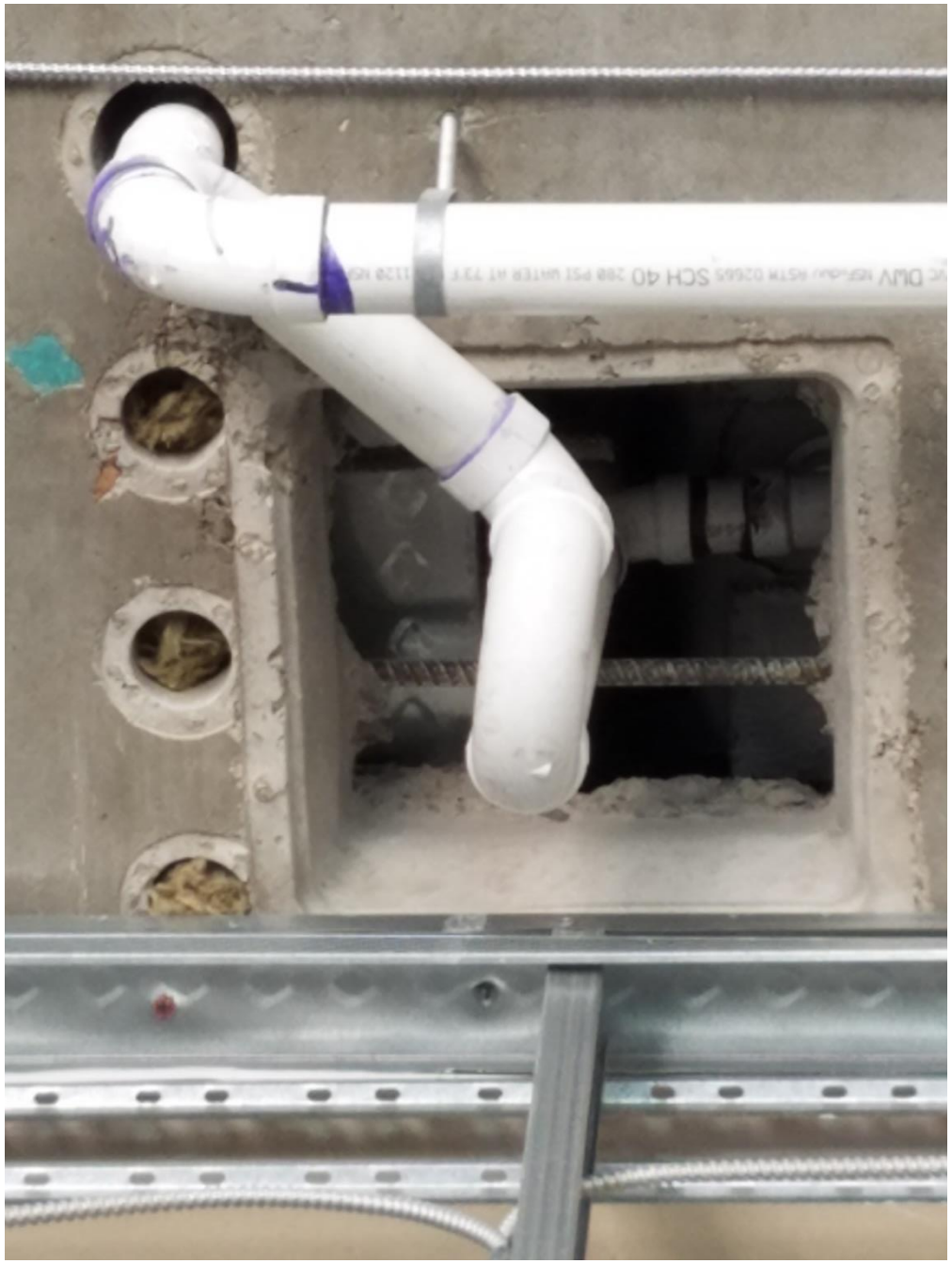
Sheet	1 of 1
Scale	5/32" = 1"
Date	Feb. 26, 2010

Drawing No. HWD 0077m

ENGINEERING JUDGMENTS

Typical situations when no systems exist:

- Annular space larger/smaller than tested
- Irregular hole shape
- Hole shape different than tested
- Curtain wall construction not identical to that tested
- More penetrating items in hole than system allows
- Access to one side only
- Oversized or exotic insulation types
- Structural member penetrations
- Intersections of rated assembly with non-rated assembly (e.g. roof deck)

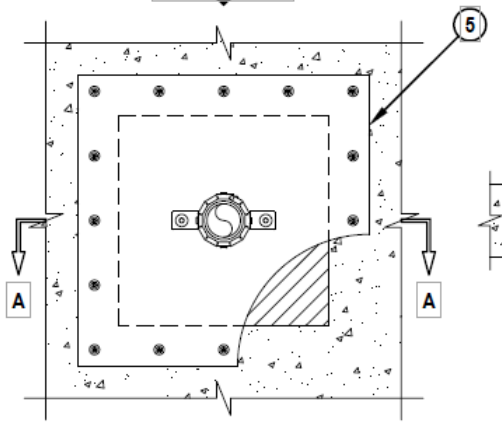


RM

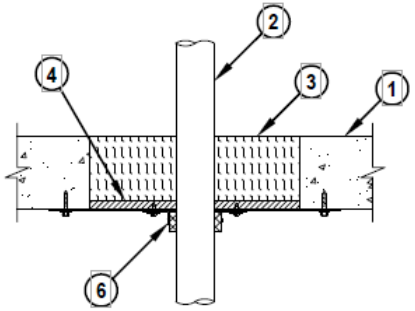
ENGINEERING JUDGMENT FIRESTOP DETAIL

PROJECT : PLANO HOTEL
CONTRACTOR : ABC CONSTRUCTION
F-RATING = 2-HR.

BOTTOM VIEW



SECTION A-A



1. CONCRETE FLOOR ASSEMBLY (MINIMUM 4-1/2" THICK) (2-HR. FIRE-RATING).
2. MAXIMUM 2" NOMINAL DIAMETER PVC PLASTIC PIPE (SCH 40).
3. MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) TIGHTLY PACKED, RECESSED TO ACCOMMODATE SEALANT.
4. MINIMUM 1/2" DEPTH HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT, FLUSH WITH BOTTOM SURFACE OF FLOOR.
5. SHEET METAL COVER PLATE (MIN. 18 GA.) ATTACHED WITH THE APPROPRIATE HILTI ANCHORS.
6. HILTI CP 643N FIRESTOP COLLAR ATTACHED WITH THE APPROPRIATE HILTI ANCHORS WITH WASHERS.

NOTES : 1. MAXIMUM SIZE OF OPENING = 13" x 13".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 9".

THIS ENGINEERING JUDGMENT REPRESENTS A FIRESTOP SYSTEM THAT WOULD BE EXPECTED TO PASS THE STATED RATINGS IF TESTED.
(REFERENCE : UL/cUL SYSTEM NO. C-AJ-8143; UL SYSTEM NO. C-AJ-2631)

Hilti Firestop Systems

HILTI, Inc.
Plano, Texas USA (800) 879-8000

Designed by Stephen Savarie

Sheet 1 of 1
Scale 1/8" = 1"
Date Sep. 27, 2017

Drawing No. 272874a

Saving Lives through Innovation and Education

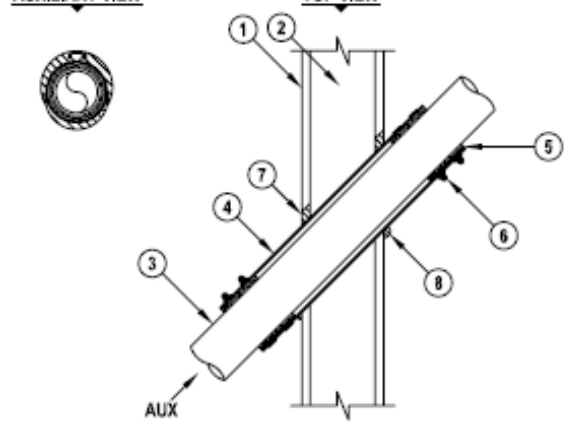
ENGINEERING JUDGEMENTS

DS

ENGINEERING JUDGMENT FIRESTOP DETAIL

PROJECT : PROJECT NAME
CONTRACTOR : CONTRACTOR NAME
F-RATING = 1-HR,

AUXILIARY VIEW TOP VIEW



1. GYPSUM WALL ASSEMBLY (UL CLASSIFIED U400 SERIES WALL) (1-HR. FIRE-RATING).
2. STEEL STUDS TO BE MINIMUM 2-1/2" WIDE.
3. MAXIMUM 3" NOMINAL DIAMETER PP PLASTIC PIPE.
4. MAXIMUM 4-1/2" NOMINAL DIAMETER SHEET METAL SLEEVE (MIN. 28 GA.) HAVING A MINIMUM 1" LAP ALONG LONGITUDINAL SEAM. LENGTH OF SLEEVE TO EXTEND 4" BEYOND EACH SURFACE OF WALL.
5. HILTI CP 648E WRAP STRIP (NOMINAL 3/16" THICK x 1-3/4" WIDE) CONTINUOUSLY WRAPPED AROUND THE OUTER CIRCUMFERENCE OF THE PIPE, COVERING TWO TIMES, AND HELD IN PLACE WITH TAPE. WRAP STRIP TO BE DOUBLE-STACKED AND INSTALLED FLUSH WITH ENDS OF SHEET METAL SLEEVE.
6. HILTI COLLAR CLAMP(S) FASTENED AROUND SHEET METAL SLEEVE AT THE CENTER OF EACH WRAP STRIP.
7. MINIMUM 5/8" DEPTH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT.
8. MINIMUM 1/2" BEAD HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT AT POINT OF CONTACT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 4-1/2".
2. ANNULAR SPACE BETWEEN SLEEVE AND PERIPHERY OF OPENING = MIN. 0", MAX. 3/4".
3. PIPE MAY BE INSTALLED AT AN ANGLE NOT GREATER THAN 45° FROM PERPENDICULAR.

THIS ENGINEERING JUDGMENT REPRESENTS A FIRESTOP SYSTEM THAT WOULD BE EXPECTED TO PASS THE STATED RATINGS IF TESTED,
(REFERENCE : UL SYSTEM NO. W-L-2340 & W-L-2453)

HILTI Firestop Systems

HILTI Inc.
Tulsa, Oklahoma USA (918) 252-6000
Designed by

Sheet 1 of 1
Scale 1/8" = 1"
Date June 30, 2006

Drawing No. 66560b

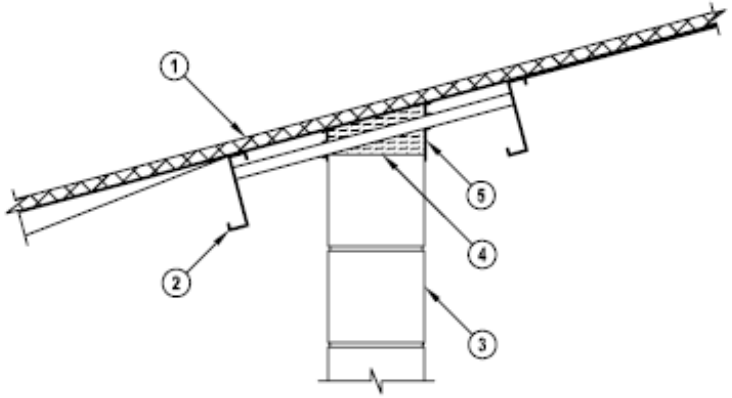
Saving Lives through Innovation and Education

DS

ENGINEERING JUDGMENT FIRESTOP DETAIL

PROJECT : PROJECT NAME
CONTRACTOR : CONTRACTOR NAME
F-RATING = 1-HR, OR 2-HR, (SEE NOTE NO. 3 BELOW)

CROSS-SECTIONAL VIEW



1. BUILT UP METAL ROOF DECK ASSEMBLY (NON FIRE-RATED).
2. STEEL Z-PURLIN ALL THE WAY ACROSS JOINT.
3. CONCRETE BLOCK WALL ASSEMBLY (UL/cUL CLASSIFIED) (MIN. 8" THICK) (1-HR. OR 2-HR. FIRE-RATING).
4. MINIMUM 8" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) COMPRESSED 33%, FLUSH WITH WALL SURFACES.
5. MINIMUM 1/8" (WET) THICKNESS HILTI CP 672 SPEED SPRAY TO COMPLETELY COVER MINERAL WOOL, OVERLAPPING MINIMUM 1/2" ONTO BLOCK WALL AND METAL DECK.

NOTES : 1. MAXIMUM WIDTH OF JOINT = 2".
2. T-RATING MAY NOT EQUAL F-RATING IN ACCORDANCE WITH UL 2079.
3. FIRE-RATING OF ASSEMBLY IS ONLY AS GOOD AS PERFORMANCE OF METAL ROOF DECK ASSEMBLY UNDER FIRE CONDITIONS.

THIS ENGINEERING JUDGMENT REPRESENTS A FIRESTOP SYSTEM THAT WOULD BE EXPECTED TO PASS THE STATED RATINGS IF TESTED,
(REFERENCE : UL SYSTEM NO. HW-D-1037)

HILTI Firestop Systems

HILTI Inc.
Tulsa, Oklahoma USA (918) 252-6000
Designed by Brett Littlefield

Sheet 1 of 1
Scale 7/64" = 1"
Date June 23, 2006

Drawing No. 66410a

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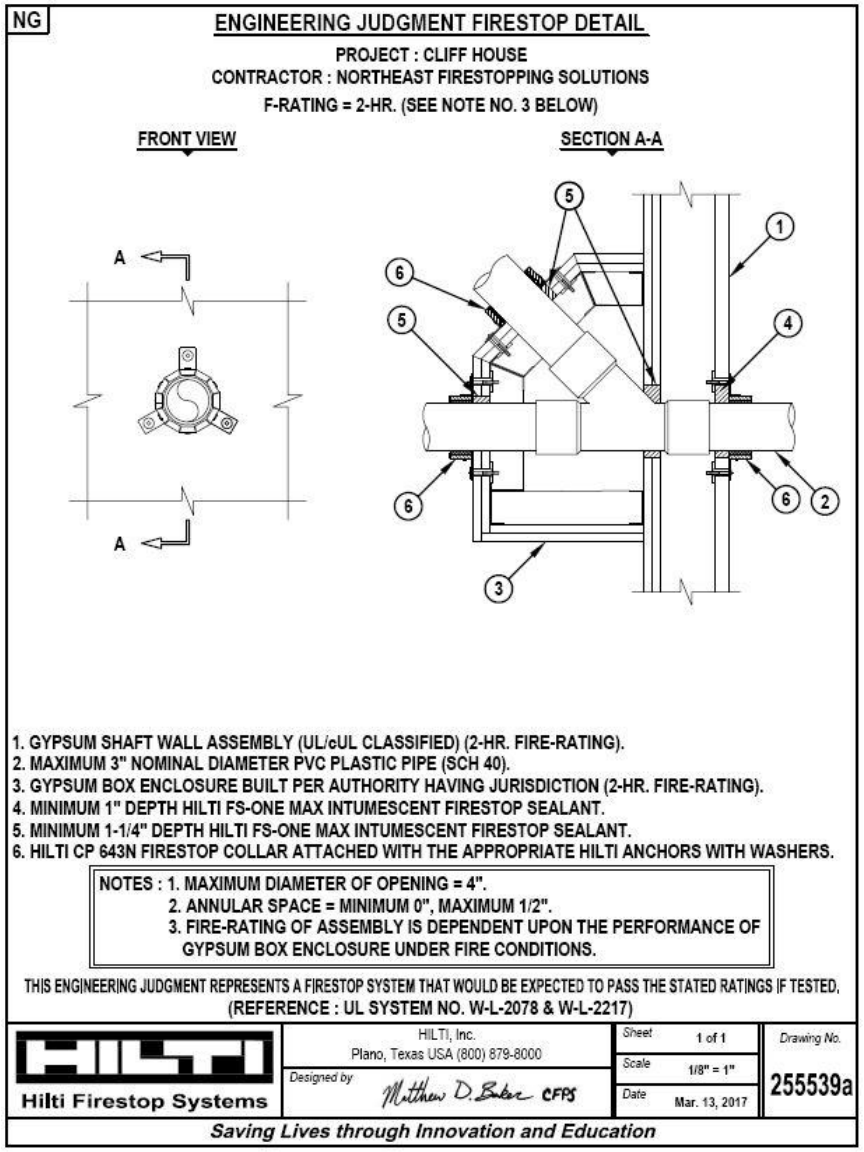
INTERNATIONAL FIRESTOP COUNCIL GUIDELINES:



NG

ENGINEERING JUDGMENT FIRESTOP DETAIL

PROJECT : CLIFF HOUSE
CONTRACTOR : NORTHEAST FIRESTOPPING SOLUTIONS
F-RATING = 2-HR. (SEE NOTE NO. 3 BELOW)

FRONT VIEW

SECTION A-A

1. GYPSUM SHAFT WALL ASSEMBLY (UL/cUL CLASSIFIED) (2-HR. FIRE-RATING).
2. MAXIMUM 3" NOMINAL DIAMETER PVC PLASTIC PIPE (SCH 40).
3. GYPSUM BOX ENCLOSURE BUILT PER AUTHORITY HAVING JURISDICTION (2-HR. FIRE-RATING).
4. MINIMUM 1" DEPTH HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.
5. MINIMUM 1-1/4" DEPTH HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.
6. HILTI CP 643N FIRESTOP COLLAR ATTACHED WITH THE APPROPRIATE HILTI ANCHORS WITH WASHERS.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 4".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1/2".
3. FIRE-RATING OF ASSEMBLY IS DEPENDENT UPON THE PERFORMANCE OF GYPSUM BOX ENCLOSURE UNDER FIRE CONDITIONS.

THIS ENGINEERING JUDGMENT REPRESENTS A FIRESTOP SYSTEM THAT WOULD BE EXPECTED TO PASS THE STATED RATINGS IF TESTED.
(REFERENCE : UL SYSTEM NO. W-L-2078 & W-L-2217)

HILTI
Hilti Firestop Systems

HILTI, Inc.
Plano, Texas USA (800) 879-8000

Designed by Matthew D. Baker CFPS

Sheet 1 of 1
Scale 1/8" = 1"
Date Mar. 13, 2017

Drawing No. 255539a

Saving Lives through Innovation and Education

IFC International Firestop Council

- **Not to be used in lieu of available tested system**
- **Be issued by qualifed technical personnel**
- **Based upon previously tested system(s)**
- **Be issued only for a single job, location, and application**
- **Based on assumption that the recommended system (EJ) would pass if tested for the required rated period of time**

AGENDA

Consequences of Fires

What is Firestop?

Fire Incident Examples

Fire Safe Building Construction & Code Requirements

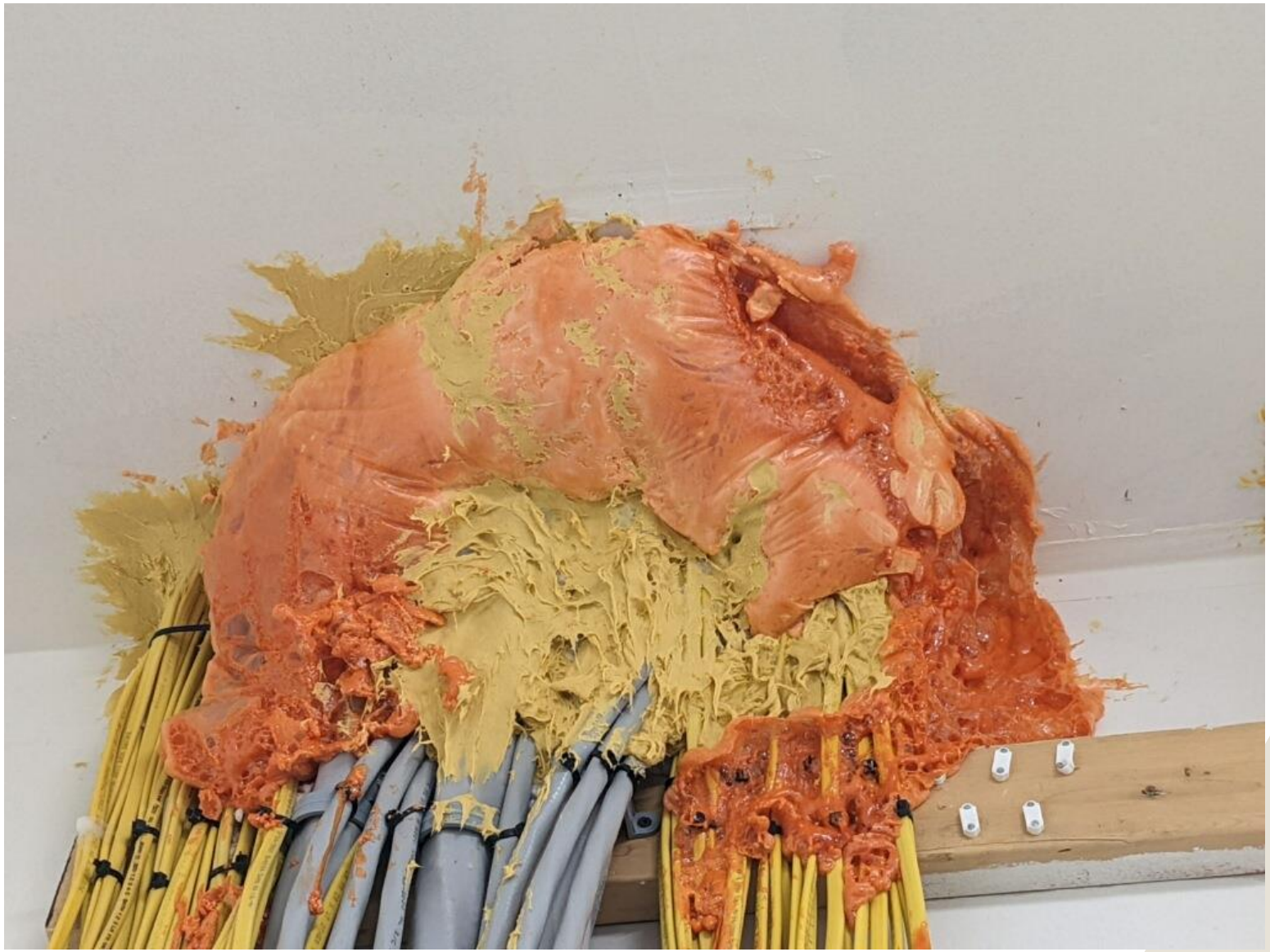
Firestop System Testing

Selecting Firestop Systems

Firestop Installation Examples

INCORRECT FIRESTOP INSTALLATIONS

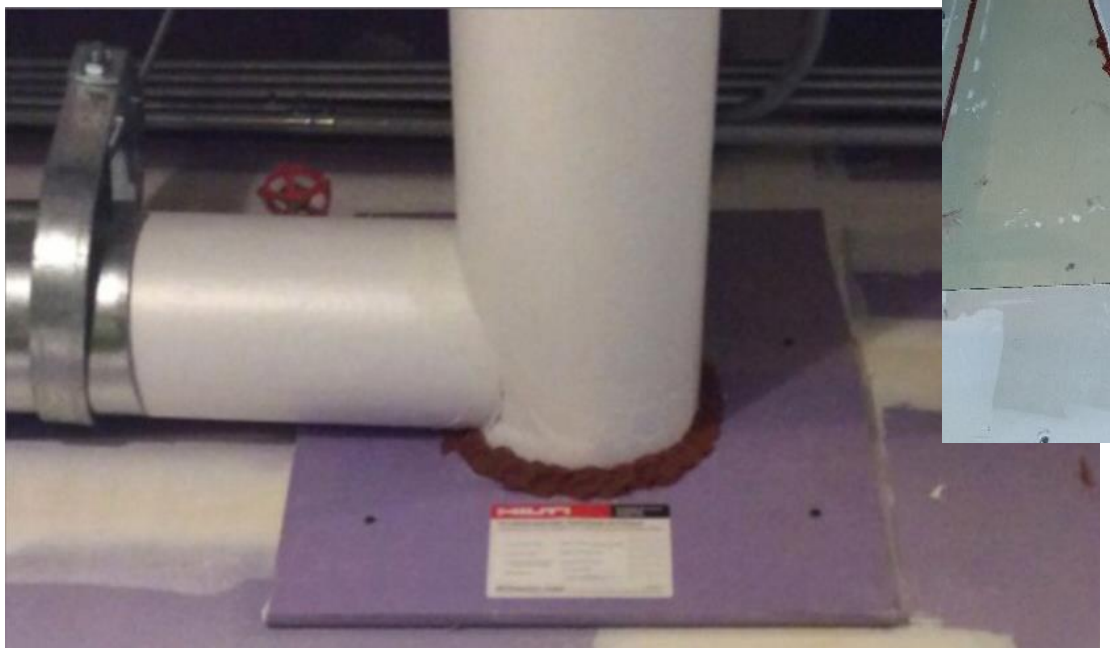
DON’T DO THIS!!!



DON’T DO THIS!!!!

DON’T DO THIS!!!

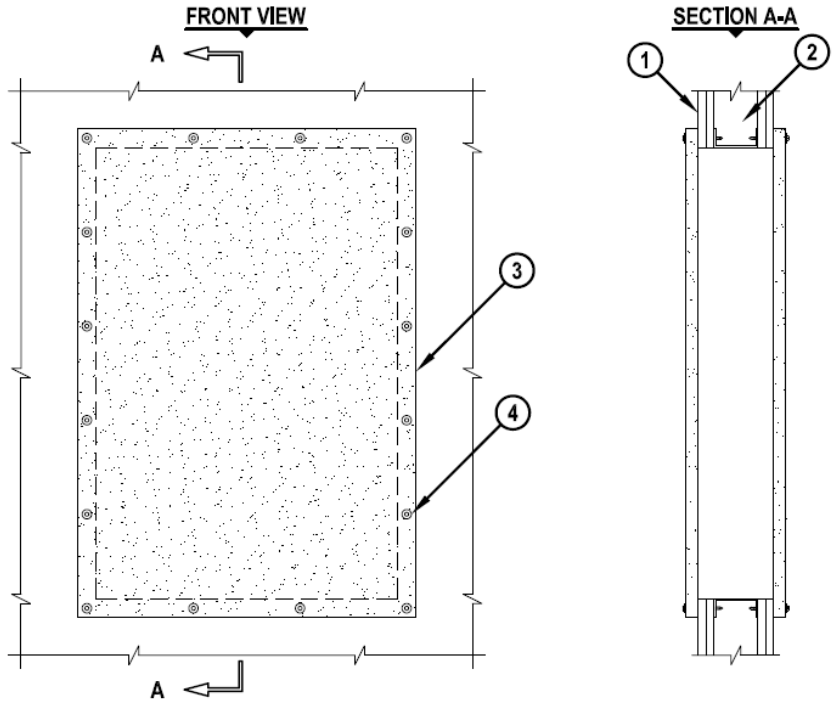
DON’T DO THIS!!!!



UL/cUL SYSTEM NO. W-L-0014

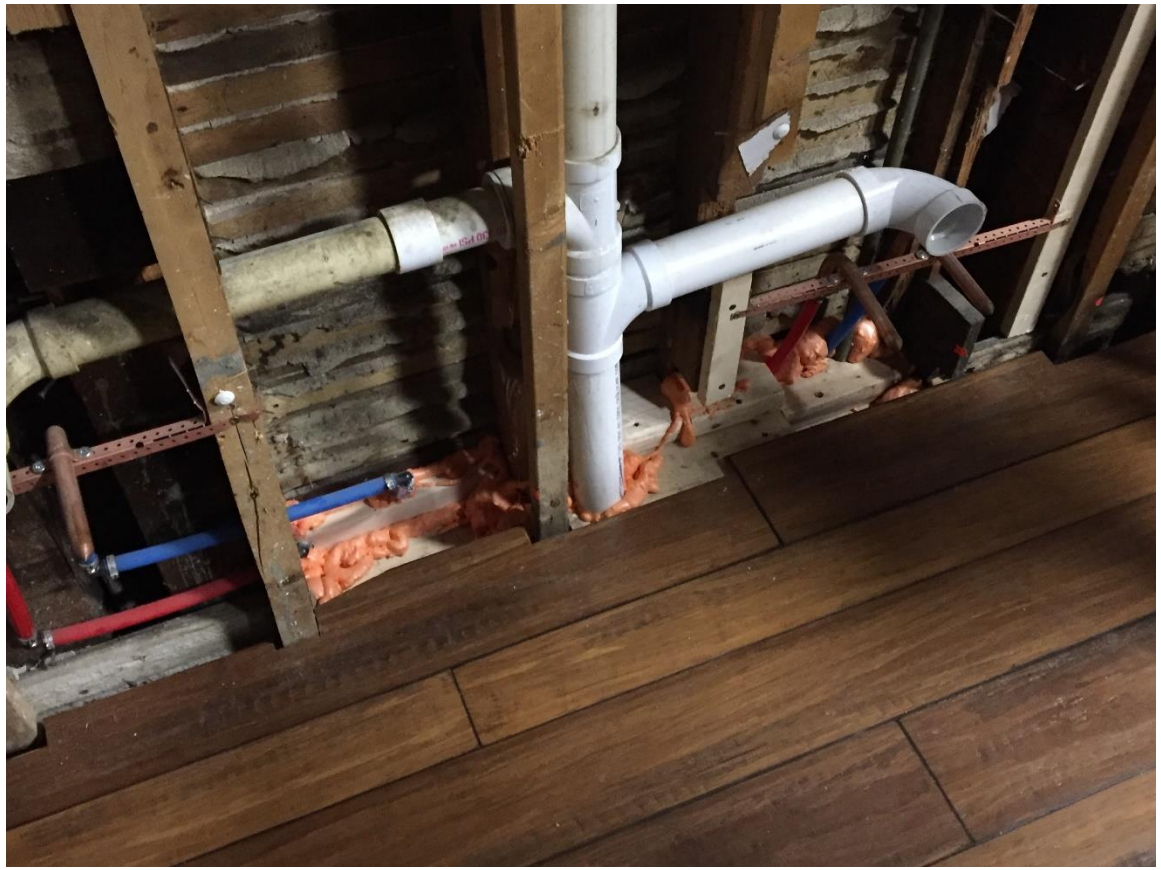
BLANK OPENING IN GYPSUM WALL ASSEMBLY

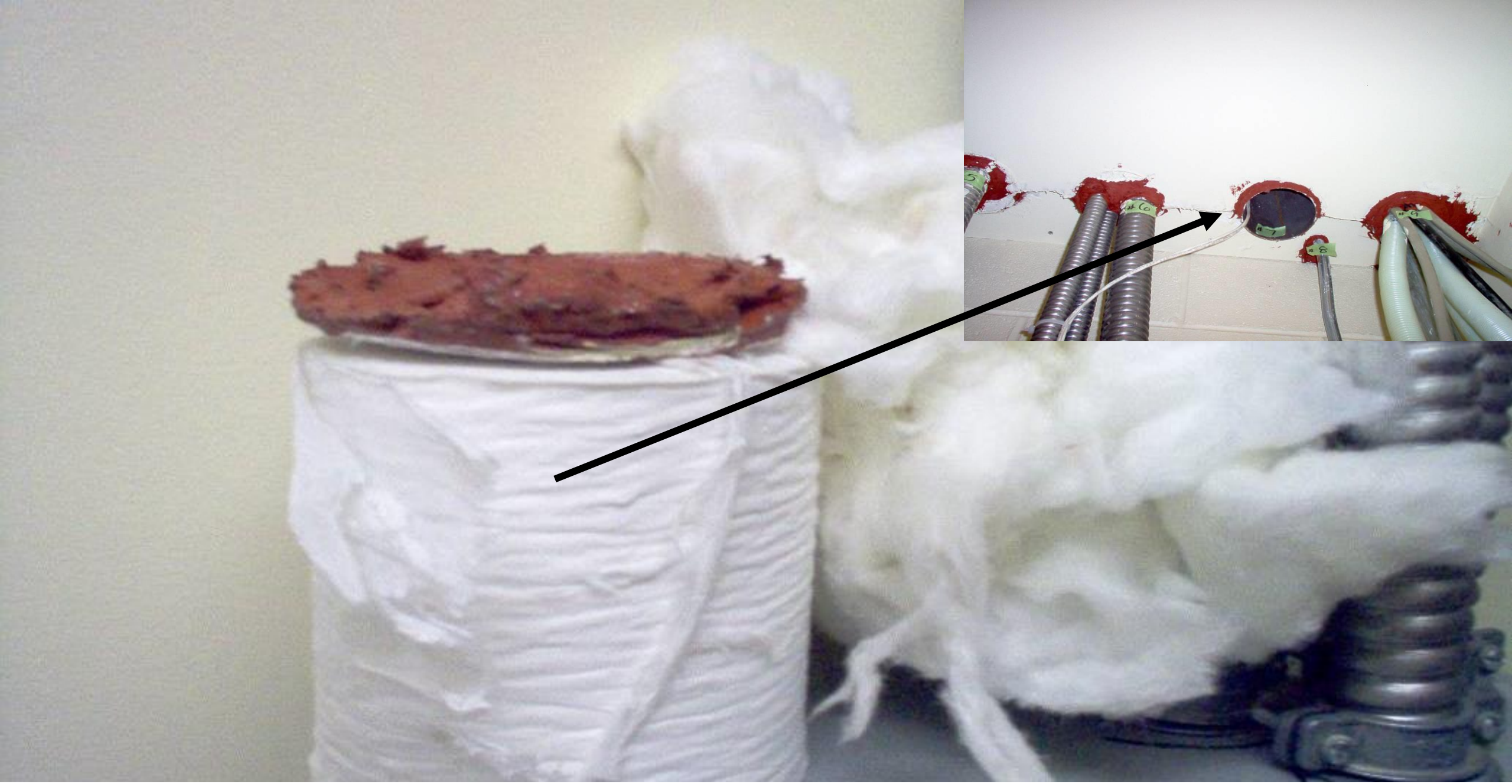
F-RATING = 1-HR. OR 2-HR.
T-RATING = 1-HR.
L-RATING AT AMBIENT = LESS THAN 1 CFM / SQ FT
L-RATING AT 400°F = LESS THAN 1 CFM / SQ FT




GEM-EZM 8
8 ZONE EXPANSION MODULE
SECURITY SYSTEM
COMPONENT

DON’T DO THIS!!!!





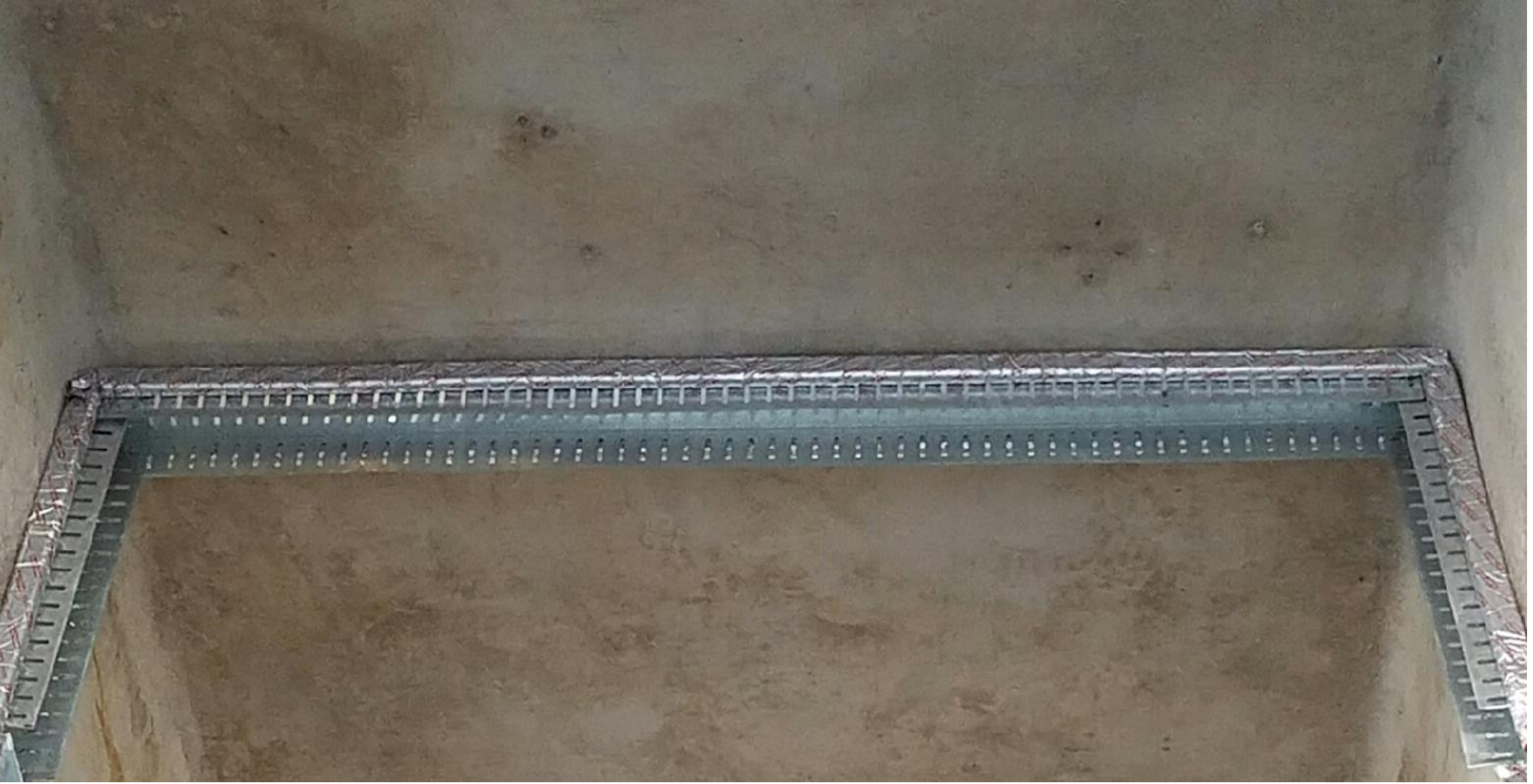
CORRECT FIRESTOP INSTALLATIONS


HILTI


WARNING
DO NOT REMOVE


HILTI


HILTI
GX 3
MaxiFlex




WARNING
DO NOT REMOVE

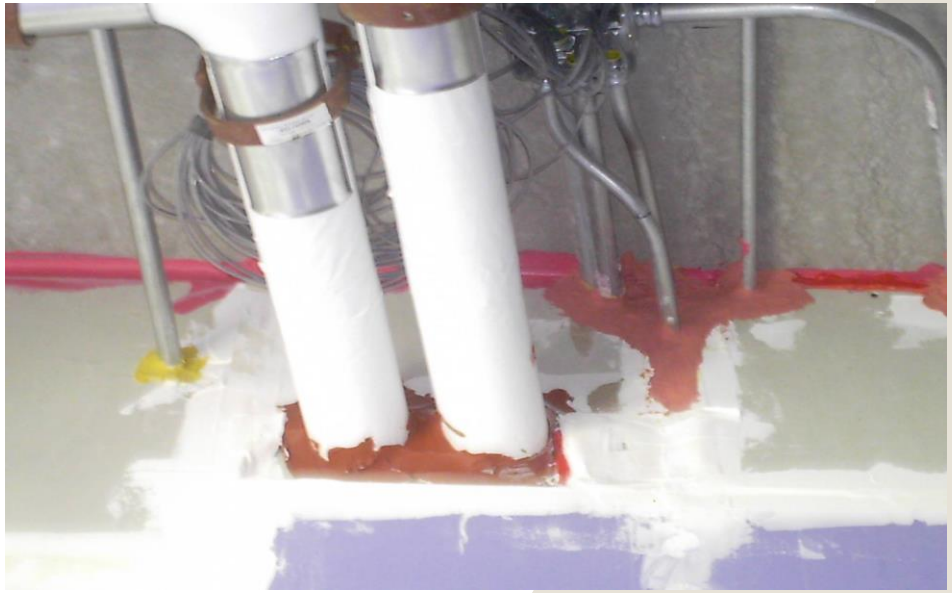

WARNING
DO NOT REMOVE

FIRESTOPPING BEST PRACTICES

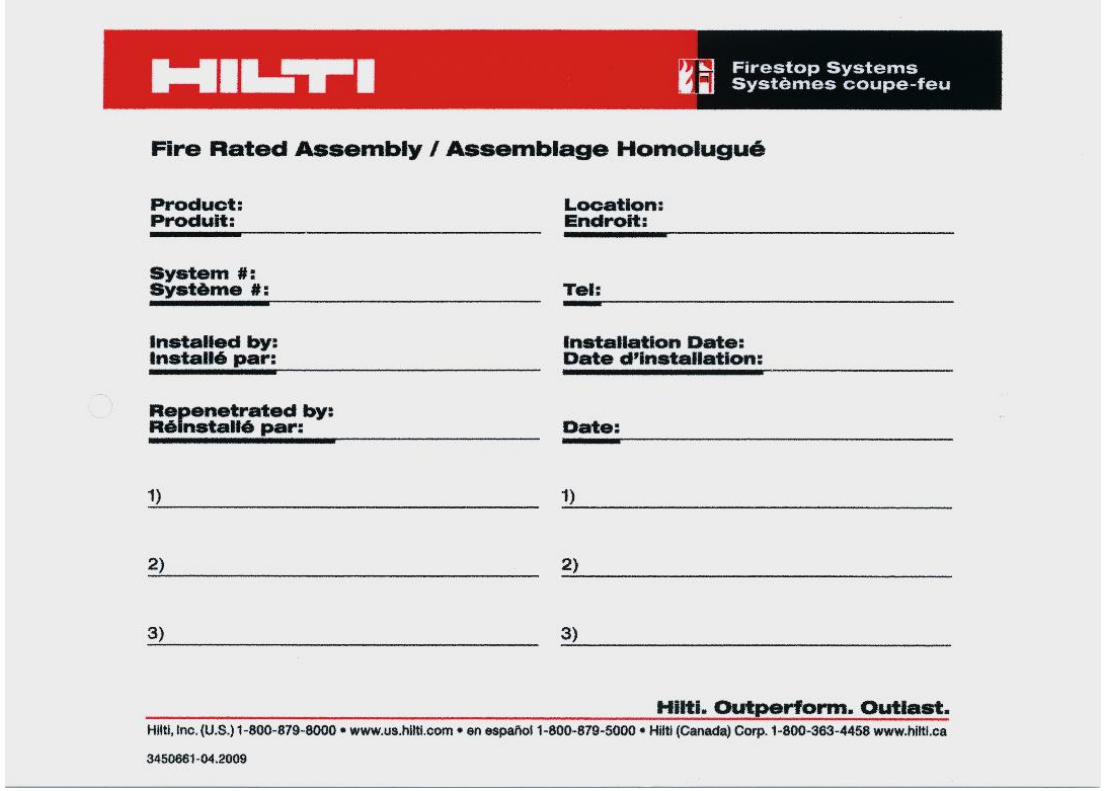
BEST PRACTICES
SINGLE SOURCE FIRESTOP MANUFACTURER

ADVANTAGES TO SINGLE SOURCE MANUFACTURER

- TESTING TO SUPPORT CHEMICAL COMPLIANCE / MIXING OF PRODUCTS
- EASIER TO INSPECT – ONE SET OF DETAILS TO REFERENCE
- MANUFACTURER'S TRAINING AND SUPPORT EASY COORDINATION / ONE MESSAGE
- EASIER FOR OWNER TO MAINTAIN



BEST PRACTICES
SYSTEM LABEL STICKERS



HILTI

Firestop Systems
Systèmes coupe-feu

Fire Rated Assembly / Assemblage Homologué

Product:
Produit: _____

Location:
Endroit: _____

System #:
Système #: _____

Tel: _____

Installed by:
Installé par: _____

Installation Date:
Date d'installation: _____

Repenetrated by:
Réinstallé par: _____

Date: _____

1) _____ 1) _____

2) _____ 2) _____

3) _____ 3) _____

Hilti. Outperform. Outlast.

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3450661-04.2009

- Installation Stickers aid in identification, inspection and tracking
- Placed next to each penetration firestop or periodically along a joint firestop
- Should meet FCIA and/or architectural specifications
- Ensure wall/floor surface is clean, dry and free of dust/debris before applying

BEST PRACTICES
MANUFACTURER'S TRAINING

WHO SHOULD BE PRESENT?

- General Contractor
- Forman from each sub-contractor installing firestop

  Individual(s) actually installing firestop
- Inspectors
  - Building Official
  - 3rd Party Inspector
- Owner's Representative

Opportunity not only for training on correct firestop installation and latest firestop technology, but clear expectations can be set

BEST PRACTICES
WALL IDENTIFICATION

2015 IBC

703.7 **Marking and identification**. Where there is an accessible concealed floor, floor-ceiling or *attic* space, *fire walls*, *fire barriers*, *fire partitions*, *smoke barriers* and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling in the concealed space. Such identification shall:

1. Be located within 15 feet (4572 mm) of the end of each wall and at intervals not exceeding 30 feet (9144 mm) measured horizontally along the wall or partition.

2. Include lettering not less than 3 inches (76 mm) in height with a minimum 3/8-inch (9.5 mm) stroke in a contrasting color incorporating the suggested wording, “FIRE AND/OR SMOKE BARRIER—PROTECT ALL OPENINGS” or other wording.

EDUCATION CONTINUES

Hilti Is There To Support You

THANK YOU

Daniel Schmidt
Senior Fire Protection Specialist
Daniel.schmidt@hilti.com
608-334-4464