

ENGINEERING JUDGMENT FIRESTOP DETAIL

PROJECT : UNC NRB
CONTRACTOR : HOK
F-RATING = 1-HR., 2-HR., OR 3-HR.

1. CONCRETE FLOOR ASSEMBLY (MINIMUM 4-1/2" THICK) (1-HR., 2-HR. OR 3-HR. FIRE-RATING).
2. CONCRETE WALL ASSEMBLY (1-HR., 2-HR., OR 3-HR. FIRE-RATING) :
 A. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE WALL (MINIMUM 6-1/2" THICK).
 B. ANY UL/CUL CLASSIFIED CONCRETE BLOCK WALL ASSEMBLY.
3. NOMINAL 1-1/2" THICKNESS MINERAL WOOL SAFING (MINIMUM 4 PCF DENSITY) COMPRESSED 50%, FLUSH WITH NON-ACCESSIBLE SIDE OF WALL.
4. MINIMUM 1/2" DEPTH HILTI CP 606 FLEXIBLE FIRESTOP SEALANT OR HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT.
5. MINIMUM 4" THICKNESS MINERAL WOOL SAFING (MINIMUM 4 PCF DENSITY) COMPRESSED 50%, FLUSH WITH ACCESSIBLE SIDE OF WALL.

NOTES : 1. MAXIMUM WIDTH OF JOINT = 4"
2. T-RATING MAY NOT EQUAL F-RATING IN ACCORDANCE WITH UL 2079.

THIS ENGINEERING JUDGMENT REPRESENTS A FIRESTOP SYSTEM THAT WOULD BE EXPECTED TO PASS THE STATED RATINGS IF TESTED.
(REFERENCE : UL/CUL SYSTEM NO. HW-D-0403, HW-D-1078 & HW-D-1104)

HILTI Firestop Systems
Hilti Firestop Systems
Saving Lives through Innovation and Education

HILTI, Inc.
Plano, Texas USA (800) 679-8000
Scale 9/64" = 1"
Feb. 26, 2019
Drawing No. 323868a

System No. W-J-1089

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings — 1 and 2 Hr (See Item 3)	F Ratings — 1 and 2 Hr (See Item 3)
T Rating — 0 Hr	FT Rating — 0 Hr
	FH Ratings — 1 and 2 Hr (See Item 3)
	FTH Rating — 0 Hr

1. Wall Assembly — Min 3-3/4 in. (95 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diameter of opening: 10-1/2 in. (267 mm).
 See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. Through-Penetrants — One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. An annular space of min 0 in. (point contact) to max 1-7/8 in. (48 mm) is required within firestop system. Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes or tubing may be used:
 A. Steel Pipe — Nom 8 in. (203 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
 B. Iron Pipe — Nom 8 in. (203 mm) diam (or smaller) cast or ductile iron pipe.
 C. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT) or 6 in. (152 mm) diam steel conduit.
 D. Copper Tubing — Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.
 E. Copper Pipe — Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.
 F. Flexible Steel Conduit* — Nom 2 in. (51 mm) diam (or smaller) flexible steel conduit.
 See Flexible Metal Conduit (DXUZ) category in the Electrical Construction Equipment Directory for names of manufacturers.

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System No. C-AJ-5090

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

1. Floor or Wall Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 18 in. (457 mm).
 See Concrete Blocks (CAZT) Category in the Fire Resistance Directory for names of manufacturers.
2. Metallic Sleeve — (Optional) — Nom 18 in. (457 mm) diam (or smaller) Schedule 10 (or heavier) steel sleeve cast or grouted into floor or wall assembly, flush with floor or wall surfaces or extending a max of 3 in. (76 mm) above floor or beyond both surfaces of wall.
3. Through Penetrants — One metallic pipe or tubing to be centered within the firestop system. Pipe or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes or tubing may be used:
 A. Steel Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
 B. Copper Pipe — Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper tubing.
 C. Copper Tubing — Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.
4. Tube Insulation — Plastics* — Min 1/2 in. (13 mm) to max 3/4 in. (19 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. Nom 1 in. (25 mm) thick AB/PVC flexible foam insulation may be used for max 2 hr F and FH Ratings when max 3 in. (76 mm) diam pipe or tubing is used. The annular space shall be min 1/2 in. (13 mm) to max 1 1/2 in. (38 mm). When max annular space exceeds 1-1/2 in. (38 mm) the F and FH Ratings are 2 hr.
 See Plastics* (QMFZ2) Category in the Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be used.
5. Firestop System — The firestop system shall consist of the following:
 A. Packing Material — Min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m³) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of fill material.
 B. Fill, Void or Cavity Material* — Sealant* — Min 1/4 in. (6 mm) thickness of fill material applied within the annulus. Flush with top surface of floor or with both surfaces of wall. When max annular space exceeds 1-1/2 in. (38 mm) the min thickness of fill material is 1/2 in. (13 mm).
 HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant or FS-One MAX Intumescent Sealant

HILTI Firestop Systems
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System No. W-J-0010

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Ratings — 0 and 1-3/4 Hr (See Item 2)	FT Ratings — 0 and 1-3/4 Hr (See Item 2)
	FH Rating — 2 Hr
	FTH Ratings — 0 and 1-3/4 Hr (See Item 2)

1. Wall Assembly — Min 6 in. (152 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 18 in. (457 mm).
 See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. Metallic Sleeve — (Optional) Nom 1-1/2, 2, 3 or 4 in. (38, 51, 76 or 102 mm) diam Schedule 5 (or heavier) steel sleeve cast or grouted into floor or wall assembly. Sleeve to be flush with wall surfaces or may extend up to 12 in. (305 mm) beyond either or both surfaces. Where sleeve extends more than 6 in. (152 mm) beyond the surface of the wall it shall be rigidly supported. When wall is constructed of concrete blocks, steel sleeve is required.
 The T, FT and FTH Ratings of the firestop system are 0 Hr when sleeve extends beyond both wall surfaces. The T, FT and FTH Ratings are 1-3/4 Hr when the sleeve is flush with both wall surfaces. See Hilti Firestop Plug 2 for details.
3. Fill, Void or Cavity Material* — Plug — Nom 2.5 or 4 in. (51, 63 or 102 mm) plug for use with steel sleeve. See Hilti Firestop Plug 2 for details.
 HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP Firestop Plug 2.5 or 4 in. or CP-PL Firestop Plug 2 or 4 in.

Sleeve/Opening Diam in. (mm)	Nom Plug Size in. (mm)	CFS-PL
1-1/2 (38)	2.5 (63)	2 (51)**
2 (51)	2.5 (63)**	2 (51)
3 (76)	4 (102)**	4 (102)**
4 (102)	4 (102)	4 (102)

** Cut wedge from plug to fit sleeve/opening size. See Hilti Installation Instructions for specific size of wedge cuts required.

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System No. W-J-1089

3. Firestop System — The firestop system shall consist of the following:
 A. Packing Material — Min 1-5/8 in. (41 or 57 mm) thickness of min 4 pcf (64 kg/m³) mineral wool batt insulation firmly packed into opening on one side of the wall as permanent form for 1 and 2 Hr ratings, respectively. Packing material to be recessed from one side of wall to accommodate the required thickness of fill material.
 B. Fill, Void or Cavity Material* — Sealant* — Min 1-1/2 in. (38 mm) thickness of fill material applied within opening, flush with one surface of wall. At the point contact location between pipe and wall, a min 1/2 in. (13 mm) diam bead of sealant material shall be applied at the pipe/wall interface.
 HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant or FS-One MAX Intumescent Sealant

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

HILTI Firestop Systems
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System No. C-AJ-5090

1. Floor or Wall Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 18 in. (457 mm).
 See Concrete Blocks (CAZT) Category in the Fire Resistance Directory for names of manufacturers.
2. Metallic Sleeve — (Optional) — Nom 18 in. (457 mm) diam (or smaller) Schedule 10 (or heavier) steel sleeve cast or grouted into floor or wall assembly, flush with floor or wall surfaces or extending a max of 3 in. (76 mm) above floor or beyond both surfaces of wall.
3. Through Penetrants — One metallic pipe or tubing to be centered within the firestop system. Pipe or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes or tubing may be used:
 A. Steel Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
 B. Copper Pipe — Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper tubing.
 C. Copper Tubing — Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.
4. Tube Insulation — Plastics* — Min 1/2 in. (13 mm) to max 3/4 in. (19 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. Nom 1 in. (25 mm) thick AB/PVC flexible foam insulation may be used for max 2 hr F and FH Ratings when max 3 in. (76 mm) diam pipe or tubing is used. The annular space shall be min 1/2 in. (13 mm) to max 1 1/2 in. (38 mm). When max annular space exceeds 1-1/2 in. (38 mm) the F and FH Ratings are 2 hr.
 See Plastics* (QMFZ2) Category in the Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be used.
5. Firestop System — The firestop system shall consist of the following:
 A. Packing Material — Min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m³) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of fill material.
 B. Fill, Void or Cavity Material* — Sealant* — Min 1/4 in. (6 mm) thickness of fill material applied within the annulus. Flush with top surface of floor or with both surfaces of wall. When max annular space exceeds 1-1/2 in. (38 mm) the min thickness of fill material is 1/2 in. (13 mm).
 HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant or FS-One MAX Intumescent Sealant

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REVISION:

LORD AECK SARGENT, A KATERA COMPANY
CERT. NO. 53391
CHAPEL HILL

SHEET TITLE
FIRESTOPPING DETAILS
SCALE (X,N)

UNC SCHOOL OF MEDICINE
NEUROSCIENCES RESEARCH BUILDING
SCO PROJECT ID: 11-09861-02G
7th & 8th FLOORS FOR DERMATOLOGY

LOCATION
115 Mason Farm Road, Campus Box 7250
Chapel Hill, North Carolina 27598-7250

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