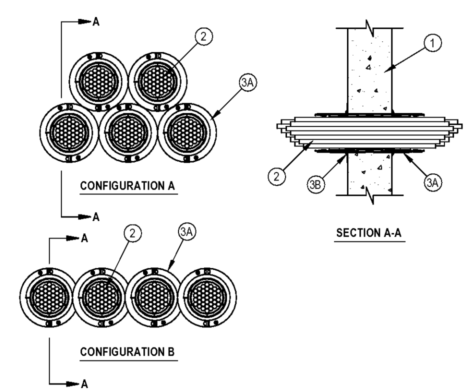
System No. W-J-3189

W-J-3189

CLASSIFIED C UL US
Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 Hr	F Rating - 2 Hr
T Ratings - 1/2 and 1-1/2 Hr (See Item 2)	FT Ratings - 1/2 and 1-1/2 Hr (See Item 2)
L Rating At Ambient - 1.2 and Less Than 1 CFM per Device (See Items 2, 3A and 3A1)	FH Rating - 2 Hr
L Ratings At 400 F - 1.3, 1.6 and Less Than 1 CFM per Device (See Items 2, 3A and 3A1)	FTH Ratings - 1/2 and 1-1/2 Hr (See Item 2)
	L Rating At Ambient - 0.6 and Less Than 0.5 L/s per Device (See Items 2, 3A and 3A1)
	L Ratings At 204°C - 0.6, 0.8 and Less Than 0.5 L/s per Device (See Items 2, 3A and 3A1)



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Hilti Firestop Systems

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System No. W-J-3189

W-J-3189

1. Wall Assembly — Minimum 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete wall. Wall may also be constructed of any UL Classified Concrete Blocks*. Maximum five individual openings may be provided (see Item 3A). Diam of opening for each firestop device shall not exceed 4-1/2 in. (114 mm) and shall be sized to the OD of the firestop device.
   See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. Cables — The aggregate cross-sectional area of cables in firestop devices to be min 0 percent (blank) to max 100 percent visual fill. Cables to be tightly bundled within the device and rigidly supported on both sides of wall assembly. Any combination of the following types and sizes of cables may be used:
   A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
   B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
   C. Max 4/0 AWG Type RHH ground cable.
   D. Max 4 pr No. 22 AWG Cat 5 or Cat 6 computer cables.
   E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
   G. Max 20/C No. 22 AWG shielded printer cable with PVC jacket.
   H. Through-Penetrating Product* - Two copper conductors No. 18 AWG (or smaller) Power or Non Power Limited Fire Alarm Cable with or without a jacket under a metal armor.
   AFC CABLE SYSTEMS INC
   I. Max. 1/4 in. (6 mm) diameter S-Video Cable consisting of 2 max 24 AWG 75 ohm coax or twisted pair cable with PE insulation and PVC jacket.
   J. Max 3/C No 12 AWG MC Cable.
   K. Through Penetrating Product* — Any cables, Armored Cable+ or Metal Clad Cable+ currently Classified under the Through Penetrating Product category. See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers.

   For opening with cables, the T, FT and FTH Ratings are 1/2 hr. For blank opening (no cables), the T, FT and FTH Ratings are 1-1/2 hr.

   L Ratings vary depending on whether the gasketing material (see Item 3) or the sealant (Item 4) is used. See Table below for L Ratings.

Max Cable Fill	Cable Type	Type L Rating, CFM (L/s) Per Device			
		Ambient		400°F (204°C)	
		Sealant	Gasket	Sealant	Gasket
0%	—	Less than 1 (Less than 0.5)	Less than 1 (Less than 0.5)	Less than 1 (Less than 0.5)	Less than 1 (Less than 0.5)
100%	Item 2D only	Less than 1 (Less than 0.5)	Less than 1 (Less than 0.5)	Less than 1 (Less than 0.5)	Less than 1 (Less than 0.5)
100%	Any cables (Item 2) in any combination	1.2 (0.6)	1.2 (0.6)	1.3 (0.6)	1.6 (0.8)

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System No. W-J-3189

W-J-3189

3. Firestop System — The firestop system shall consist of the following:
   A. Firestop Device* — Maximum five firestop devices grouped in two row configuration as depicted. The individual openings in the wall for each device are spaced min 2-7/16 in. (62 mm) apart such that the device flanges of adjacent devices are no closer than point contact. Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, twisted inner fabric smoke seal, flanges and gasketing material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. As an option, the inner fabric seal within each device may remain open except that, for all blank devices (no cables), the inner fabric seal shall be twisted to completely close the device. In addition, to attain the L Rating, the inner fabric seal must also be twisted to completely close the opening within each device. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. Device provided with flanges that are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. The annular space between each device and the periphery of the opening shall be nom 0 in. (point contact). Device flanges are to be secured to wall with min two 1-1/4 in. (32 mm) long masonry screws or anchors. As an alternate to gasket material, sealant (Item 3B) may be used.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 and CP 653 BA 2" Speed Sleeve, CP 653 and CP 653 BA 4" Speed Sleeve, CFS-SL GA L Speed Sleeves, CP 653 4" BA ILS and CFS-SL GA L ILS Speed Sleeve.
   The CFS-SL GA L and CFS-SL GA L ILS Speed Sleeves shall only be used in wall thickness of 8 in. (203 mm) or greater.
   A1. Firestop Device* — Same as Item A above except maximum four firestop devices grouped in one row as depicted. The individual openings in the wall for each device are spaced min 1-7/16 in. (36.5 mm) apart. Device flanges may overlap one another. As an option, the inner fabric seal may remain open except that, to attain the L Rating, the inner fabric seal shall be twisted to completely close off the opening within each device.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 and CP 653 BA 2" Speed Sleeve, CP 653 and CP 653 BA 4" Speed Sleeve, CFS-SL GA L Speed Sleeves, CP 653 4" BA ILS and CFS-SL GA L ILS Speed Sleeve.
   The CFS-SL GA L and CFS-SL GA L ILS Speed Speed Sleeves shall only be used in wall thickness of 8 in. (203 mm) or greater.
   B. Fill, Void or Cavity Material* — As an alternate to gasket material (see Item 3A), min 1/4 in. (6 mm) bead of fill material applied around periphery of each device to wall interface on both sides of wall prior to installing device flanges.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 606 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.

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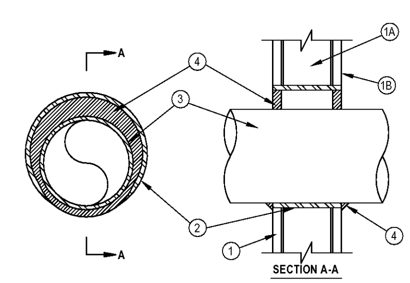
1 Cable Thru Rated Concrete Wall Assembly
Scale: Not to Scale

System No. W-L-1164

WL 1164

CLASSIFIED C UL US
Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

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



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 described in the individual U300, U400, V400 or W400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) 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. (102 to 152 mm) wider and 4 to 6 in. (102 to 152 mm) higher than the diam of the penetrating item such that, when the penetrating item is installed in the opening, a 2 to 3 in. (51 to 76 mm) clearance is present between the penetrating item and the framing on all four sides.
   B. Gypsum Board* — The gypsum wallboard type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual Wall and Partition Design. Max diam of opening in steel stud walls is 32 in. (813 mm). Max diam of openings in wood stud walls is 14-1/2 in. (368 mm).
   The hourly F, FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. Steel Sleeve — Nom 32 in. (813 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe sleeve friction fit in nom 32 in. (813 mm) diam circular opening cut through gypsum board layers. Length of steel sleeve to be equal to thickness of wall.

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System No. W-L-1164

WL 1164

3. Through-Penetrant — One metallic pipe, conduit or tubing installed either concentrically or eccentrically within the firestop system. The annular space between pipe, conduit or tubing and the steel sleeve shall be min 0 in. (point contact) to max 1-7/8 in. (48 mm). 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. (762 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. Iron Pipe — Nom 30 in. (762 mm) diam (or smaller) service weight (or heavier) cast iron soil pipe or Class 50 (or heavier) ductile iron pressure pipe.
   C. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing.
   D. Copper Tubing — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.
   E. Copper Pipe — Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.
4. Fill, Void or Cavity Material* - Sealant — Min 5/8 in. (16 mm) and 1-1/4 in. (32 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly in 1 or 2 hr rated walls, respectively. Min 1/2 in. (13 mm) diam bead of caulk applied to the penetrant/gypsumboard interface at the point contact location on both sides of wall.
   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.

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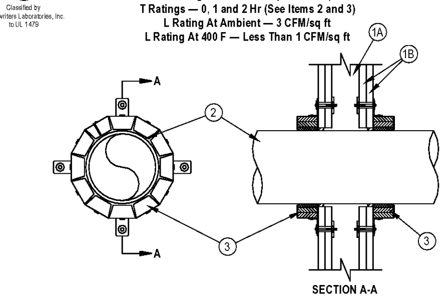
2 Metallic Conduit Thru Rated Gypsum Wallboard/Stud Wall Assembly
Scale: Not to Scale

System No. W-L-2078

WL 2078

CLASSIFIED UL
Classified by Underwriters Laboratories, Inc. to UL 1479

F Ratings — 1 and 2 Hr (See Item 1)
T Ratings — 0, 1 and 2 Hr (See Items 2 and 3)
L Rating At Ambient — 3 CFM/sq ft
L Rating At 400 F — Less Than 1 CFM/sq ft



1. Wall Assembly — The 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 construction features noted below:
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC.
   B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board, as specified in the individual Wall and Partition Design. Max diam of opening is 11-1/2 in. (292 mm).
   The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.
2. Through-Penetrants — One nonmetallic pipe, conduit or tubing to be installed within the firestop system. The annular space between pipe and periphery of opening shall be min 0 in. (point contact) to max 1/2 in. (13 mm). Pipe or conduit to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 10 in. (254 mm) 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 system.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 10 in. (254 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. Acrylonitrile Butadiene Styrene (ABS) Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 40 solid-core or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   D. Flame Retardant Polypropylene (FRPP) Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 40 FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   E. Polyvinylidene Fluoride (PVDF) Pipe — Nom 4 in. (102 mm) diam (or smaller) PVDF pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   F. Crosslinked Polyethylene (PEX) Tubing — Nom 4 in. (102 mm) diam (or smaller) SDR 9 Uponor AquaPEX or Wirsbo hePEX PEX tube for use in closed (process or supply) piping systems.
   When max 6 in. diam pipe is used, T Rating is equal to the hourly fire rating of the wall except that when penetrant type 2F is used, T Rating is 0 hr. When nom 8 in. or 10 in. (203 or 254 mm) diam pipe is used, T Rating is 0 hr.

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Hilti Firestop Systems

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System No. W-L-2078

WL 2078

3. Firestop Device* — Firestop Collar — Firestop collar shall be installed in accordance with the accompanying installation instructions. Collar to be installed and latched around the pipe and secured to both sides of the wall using the anchor hooks provided with the collar. (Minimum two anchor hooks for 1-1/2 and 2 in. (38 and 51 mm) diam pipes, three anchor hooks for 3 and 4 in. (76 and 102 mm) diam pipes, four anchor hooks for 6 in. (152 mm) diam pipes, ten anchor hooks for 8 in. (203 mm) diam pipes and twelve anchor hooks for 10 in. (254 mm) diam pipes. The anchor hooks are to be secured to the surface of wall with 3/16 in. (4.8 mm) diam by 2-1/2 in. (64 mm) long steel toggle bolts along with washers. As an alternate for pipe sizes of nom 4 in. diam or less, min No. 10 by 1-1/2 in. (254 by 38 mm) long drywall or laminate screws with min 3/4 in. (19 mm) steel washers may be used. When the drywall or laminate screw is used, T Rating shall not exceed 1 hr.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 643 50/1.5"N, CP 643 63/2"N, CP 643 90/3"N, CP 643 110/4"N, CP 643 160/6"N, CP 644-200/8" US and CP 644-250/10" US Firestop Collars
4. Fill, Void or Cavity Material* — Sealant - (Not Shown) — Min 1/2 in. (13 mm) thickness of sealant applied within the annular space for nom 8 in. and 10 in. (203 and 254 mm) diam pipes, flush with each side of wall. Sealant in annular space is optional for max 6 in. (152 mm) diam pipes except that for penetrant type 2F, sealant is required. A min 1/4 in. (6 mm) thickness of sealant is required within the annular space, flush with each side of wall, to attain the L Ratings for max 6 in. (152 mm) diam pipes.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — 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.

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3 Non-Metallic Conduit Thru Rated Gypsum Wallboard/Stud Wall Assembly
Scale: Not to Scale

Notes:

1. *Refer to section XXXX of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.*
2. *Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:*
   ** Minimum and maximum Width of Joints*
   ** Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.*
3. *If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.*
4. *References:*
   ** Underwriter's Laboratories Fire Resistance Directory, Volume 2*
   ** NFPA 101 Life Safety Code*
   ** All governing local and regional building codes*
5. *Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating equal to that of construction being penetrated.*
6. *All rated through-penetrations shall be prominently labeled with the following information:*
   ** ATTENTION: Fire Rated Assembly*
   ** UL System #*
   ** Product(s) used*
   ** Hourly Rating (F-Rating)*
   ** Installation Date*

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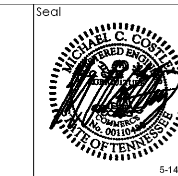
Seal



5-14-2020

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Project: 1928
CADD File:
Drawn By: SW
Checked By: WM

Permit Release:
May 19, 2020
Construction Release Set:
May 19, 2020

Revisions

No.	Date	Description

ASI / RFI Revisions

No.	Date	Description

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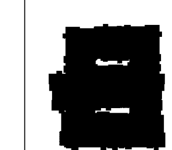

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