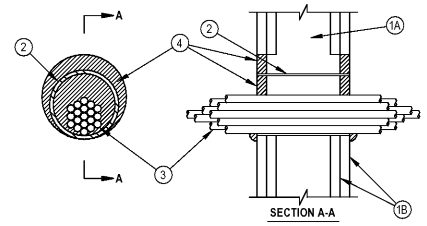
System No. W-L-3065

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

WL 3065

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 1 and 2 Hr (See Item 1)	F Rating — 1 and 2 Hr (See Item 1)
T Rating — 0 and 3/4 Hr (See item 3)	FT Rating — 0 and 3/4 Hr (See item 3)
L Rating At Ambient — 15 CFM/sq ft	FH Rating — 1 and 2 Hr (See Item 1)
L Rating At 400 F — 8 CFM/sq ft	FTH Rating — 0 and 3/4 Hr (See item 3)
	L Rating At Ambient — 15 CFM/sq ft
	L Rating At 400 F — 8 CFM/sq ft



1. Wall Assembly — The 1 or 2 fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs — Wall framing may consist of either wood studs or 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.
   B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board, 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 Wall and Partition Design in the UL Fire Resistance Directory. Max diam of opening is 5-1/2 in. (138 mm) when sleeve (Item 2) is employed. Max diam of opening is 4 in. (102 mm) when sleeve (Item 2) is not employed.

   The F, FH Ratings of the firestop system are equal to the fire rating of the wall assembly.
2. Metallic Sleeve — (Optional) - Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT) or Schedule 5 (or heavier) steel pipe or min 0.016 in. thick (0.41 mm, No. 28 ga) galv steel sleeve installed flush with wall surfaces. The annular space between steel sleeve and periphery of opening shall be min 0 in. (0 mm, point contact) to max 1 in. (25mm). When Schedule 5 steel pipe or EMT is used, sleeve may extend up to 18 in. (457 mm) beyond the wall surfaces. As an option when Schedule 5 steel pipe or EMT is used, sleeve may extend continuously beyond one wall surface. When cable bundle penetrates wall assembly at an angle of 45 degrees, no metallic sleeve is used.

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WL 3065

3. Cables — Aggregate cross-sectional area of cable in opening to be max 45 percent of the cross-sectional area of the opening. The annular space between the cable bundle and the periphery of the opening to be min 0 in. (point contact) to max 1 in. (25 mm). When sleeve is continuous on one side of wall (see Item 2), the cable fill may be 0 to 45% and the max annular space is not limited. Cables to be rigidly supported on both sides of the wall assembly. Any combination of the following types and sizes of copper conductor cables may be used:
   A. Max 7/C No. 12 AWG with polyvinyl chloride (PVC) insulation and jacket.
   B. Max 25 pair No. 24 AWG telephone cable with PVC insulation and jacket.
   B1. Max 4 pr No. 22 AWG Cat 5 or Cat 6 computer cables.
   C. Type RG/U coaxial cable with polyethylene (PE) insulation and PVC jacket having a max outside diameter of ½ in. (13 mm).
   C1. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   D. Multiple fiber optical communication cable jacketed with PVC and having a max OD of 5/8 in. (16 mm).
   E. Through Penetrating Products*— Max three copper conductor No. 8 AWG .Metal-Clad Cable+.
   AFC CABLE SYSTEMS INC
   F. Max 3/C (with ground)(or smaller) No. 8 AWG copper conductor cable with PVC insulation and jacketing.
   G. Max 3/4 in. (19 mm) diam copper ground cable with or without a PVC jacket.
   H. Fire Resistive Cables* - Max 1-1/4 in. (32 mm) diam single conductor or multi conductor Type MI cable. A min 1/8 in. (3 mm) separation shall be maintained between MI cables and any other types of cable.
   I. Max 4/C with ground 300 kcmil (or smaller) aluminum SER cable with PVC insulation and jacket.
   J. Through Penetrating Product* - Any cables, Metal-Clad Cable+ or Armored Cable+ currently Classified under the Through Penetrating Products category.
   K. Maximum 3/C No. 8 AWG metal-clad cable.
   L. Maximum 5/8 diam fiber-optic cable with PVC jacket.
   For cable bundle penetrating the wall assembly at an angle of 45 degrees, the T, FT, FTH Ratings are 0 hr and 3/4 hr for 1 and 2 hr wall assemblies, respectively.
   See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers.
4. Fill, Void or Cavity Material*— Sealant or Putty — Fill material applied within the annulus, flush with each end of the steel sleeve or wall surface. Fill material installed symmetrically on both sides of the wall. A min 5/8 in. (16 mm) thickness of sealant is required for the 1 or 2 hr F Rating . An additional 1/2 in. (13 mm) diam bead of fill material shall be applied at the interface of sleeve with gypsum board.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP601S, CP606, FS-One Sealants or FS-ONE MAX Intumescent Sealantor or CP618 Putty

5. Packing Material — (Optional, Not Shown) — Mineral wool forming material may be used as a backer for the fill material (Item 4). When used, it shall be firmly packed into annular space within the sleeve as a permanent form and recessed from end of sleeve to accommodate the required thickness of fill material.

* 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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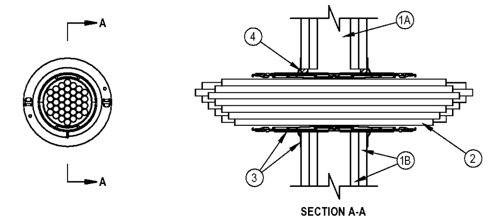
1 Copper Conductor Cables Thru Rated Gypsum Wallboard/Stud Wall Assembly
Scale: Not to Scale

System No. W-L-3334

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

WL 3334

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1, 2, 3 and 4 Hr (See Item 1)	F Ratings - 1, 2, 3 and 4 Hr (See Item 1)
T Ratings - 0, 1/2, 1, 1-1/2, 2 Hr (See Items 2 and 3)	FT Ratings - 0, 1/2, 1-1/2, and 2 Hr (See Items 2 and 3)
L Rating At Ambient - See Item 2	FH Ratings - 1, 2, 3 and 4 Hr (See Item 1)
L Ratings At 400 F - See Item 2	FTH Ratings - 0, 1/2, 1, 1-1/2, and 2Hr (See Items 2 and 3)
	L Rating At Ambient - See Item 2
	L Ratings At 204°C - See Item 2



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System No. W-L-3334

WL 3334

1. Wall Assembly — The 1, 2, 3 or 4 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described within the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall incorporate the following construction features:
   A. Studs — Wall framing shall 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 for 1 and 2 hr wall assemblies. Steel Studs to be 3-5/8 in. (92 mm) for 3 and 4 hr wall assemblies. Steel studs to be min 3-1/2 in. (89 mm) wide when 3/4 in. (19 mm) thick gypsum board is used (see Item 1B).
   B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Alternately, for 1 and 2 hr rated walls only, min one layer of nom 3/4 in. (19 mm) thick gypsum board on each side of wall as specified in the individual Wall and Partition Design may be used. Opening in gypsum board to be max 2-1/2 in. (64 mm) diam for 2" device and max 4-1/2 in. (114 mm) diam for 4" device.

   The hourly F and FH Ratings of the firestop system are dependent upon the hourly rating of the wall in which it is installed.
2. Cables — Within the loading area for each firestop device, the cables may represent 0 to 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 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 PE 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. 16 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 two No. 26 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.
   When the hourly rating of the wall assembly is 1 hr, the T, FT and FTH Ratings are 0 hr. When the hourly rating of the wall assembly is 2 hr, the T, FT and FTH Ratings are 1 hr except that, when Item 2J or 2K is used, the T, FT and FTH Ratings are 1/2 hr . When the hourly rating of the wall assembly is 3 or 4 hr, the T, FT and FTH Ratings are 1-1/2 and 2 hr, respectively.
   L Ratings apply only when device flanges are used. 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	L Rating, CFM/Sq Ft (L/s/m²)				L Rating, CFM (L/s)			
		Ambient		400°F (204°C)		Ambient		400°F (204°C)	
		Sealant	Gasket	Sealant	Gasket	Sealant	Gasket	Sealant	Gasket
0%	—	Less than 1 (Less than 5.1)	1.0 (5.1)	Less than 1 (Less than 5.1)	2.7 (13.7)	Less than 1	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	4.9 (24.9)	4.9 (24.9)	1.3 (6.6)	3.5 (17.8)	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	9.2 (46.7)	9.2 (46.7)	9.6 (48.8)	11.8 (59.9)	1.2 (0.6)	1.2 (0.6)	1.3 (0.6)	1.6 (0.8)

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2 Cables Thru Gypsum Wallboard/Stud Wall Assembly
Scale: Not to Scale

System No. W-L-3334

WL 3334

3. Firestop Device* — 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 may remain open except that, to attain the L Rating, the inner fabric seal shall be twisted to completely close off the opening within device. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flanges that are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. As an alternate to gasket material, sealant (Item 4) may be used. Device flanges are optional, except that when 3/4 in. (19 mm) gypsum board (see Item 1B) is used, device flanges shall be used and for 3 and 4 hr fire rating, device flanges shall be used. When the device flanges are not used, the T, FT and FTH Ratings for the firestop system are 0 hr.

   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.
4. Fill, Void or Cavity Material* - Sealant — As an alternate to gasket material (see Item 3), min 1/2 in. (13 mm) thickness of fill material applied within the annulus between firestop device and wall, flush with both surfaces of wall, and an additional 1/4 in. (6 mm) bead applied around periphery of device. When device flanges are used, gypsum drywall compound may be used in place of the fill material. Sealant is required when device flanges are not used (see Item 3).

   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE MAX Intumescent Sealant, or CP 606 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

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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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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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Drawing Title:
Electrical Penetration Details

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