

**System No. W-J-1058**  
F Ratings — 1 and 2 Hr  
T Rating — 0 Hr

**SECTION A-A**

- Wall Assembly — Min 5 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks\*. Max diam of opening is 13 in.
- Through Penetrants — One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. Pipe, conduit or tubing to be rigidly supported on both sides of the assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
  - Steel Pipe — Nom 8 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
  - Iron Pipe — Nom 8 in. diam (or smaller) cast or ductile iron pipe.
  - Conduit — Nom 4 in. diam (or smaller) steel electrical metallic tubing or steel conduit.
- Pipe Covering — Nom 2 in. thick hollow cylindrical heavy density (min 3.5 pcf) fiberglass pipe covering with an all-service jacket. Pipe covering material to extend 2 in. beyond both sides of wall surface. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap (SSL) tape. The annular space between the pipe covering and periphery of opening shall be min 0 in. (point contact) to max 3/8 in.
- Fill, Void or Cavity Material\* — Sealant — In 2 hr assemblies, min 1-1/4 in. thickness of fill material applied within annulus flush with both surfaces of wall. In 1 hr assemblies, min 1-1/4 in. thickness of fill material applied within annulus flush with both surfaces of wall. For both 1 and 2 hr assemblies, at point contact location between insulation and gypsum board, a min 1/2 in. bead of fill material shall be applied on both sides of wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant  
\*Bearing the UL Classification Mark

**HILTI** Firestop Systems  
Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. October 22, 1998

**System No. W-J-7021**  
F Ratings — 1 and 2 Hr (See Item 3)  
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

**SECTION A-A**

- Wall Assembly — Min 5 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks\*. Max area of opening is 1300 in. with a max dimension of 50 in.
- Steel Duct — Nom 24 in. by 48 in. (or smaller) No. 24 gauge (or heavier) galv steel duct to be installed within the firestop system. The annular space shall be min 0 (point contact) in. to a max 2 in. Duct to be rigidly supported on both sides of the wall assembly
- Firestop System — The firestop system shall consist of the following:
  - Fill, Void or Cavity Material\* — Sealant — Min 5/8 in. thickness of fill material applied within annulus flush with both surfaces of wall. At point contact location, a min 1/2 in. diam bead of fill material shall be applied to the wall/duct interface on both surfaces of wall.
  - HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant, CP601S Elastomeric Firestop Sealant or CP606 Flexible Sealant.
  - Steel Retaining Angle — Min No. 18 MSG (0.048 in.) galv steel angles cut to fit contour of duct with a 2 in. overlap on the duct and a min 1 in. overlap on the gypsum board assembly on both surfaces of wall. 2 in. leg of angle secured to duct with min No. 8 by 3/4 in. long sheet metal screws, spaced a max of 6 in. OC.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant  
\*Bearing the UL Classification Mark

**HILTI** Firestop Systems  
Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. August 27, 2010

**System No. W-L-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**

- 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:
  - 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.
  - 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.

**HILTI** Firestop Systems  
Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. December 4, 2002

**System No. W-L-3065**  
F Ratings — 1 and 2 Hr (See Item 1)  
T Rating — 0 Hr

**SECTION A-A**

- 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 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
  - 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.
  - 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 U300, U400 or V400 Series 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 Rating of the firestop system is equal to the fire rating of the wall assembly.
- Fill, Void or Cavity Material\* — Sealant — Min 5/8 in. thickness of fill material applied within annulus flush with both surfaces of wall. At point contact location, a min 1/2 in. diam bead of fill material shall be applied to the wall/cable bundle interface on both surfaces of wall.
- HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant, CP601S Elastomeric Firestop Sealant or CP606 Flexible Sealant.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant  
\*Bearing the UL Classification Mark

**HILTI** Firestop Systems  
Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. May 31, 2007

**System No. W-J-5041**

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

**SECTION A-A**

- Wall Assembly — Min 3-3/4 in. (95 mm) and 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m<sup>3</sup>) concrete required for F and FH Ratings of 1 and 2 Hr, respectively. Wall may also be constructed of any UL Classified Concrete Blocks\*. Max diam of opening is 7-1/2 in. (191 mm).
- 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 wall assembly. The following types and sizes of metallic pipes or tubing may be used:
  - Steel Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe.
  - Copper Tubing — Nom 2 in. (51 mm) diam (or smaller) Type L (or heavier) copper tubing.
  - Copper Pipe — Nom 2 in. (51 mm) diam (or smaller) regular (or heavier) copper pipe.
- 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. An annular space of min 0 in. (point contact) to max 1-1/2 in. (38 mm) is required within the firestop system. When tube insulation thickness is less than 3/4 in. (19 mm), the T, FT and FTH Ratings are 0 Hr.
- See Plastics\* (QMFZ) 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.
- Fill, Void or Cavity Material\* — Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with both surfaces of wall. At the point contact location between pipe covering and wall, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe covering/wall interface on both surfaces of wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant  
\*Bearing the UL Classification Mark

**HILTI** Firestop Systems  
Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. February 21, 2012

**System No. W-L-2098**  
F Ratings — 1 and 2 Hr (See Item 1)  
T Ratings — 1 and 2 Hr (See Item 1)  
L Rating At Ambient — Less Than 1 CFM/Sq Ft  
L Rating At 400 F — 4 CFM/Sq Ft

**SECTION A-A**

- Wall Assembly — The 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:
  - 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.
  - Gypsum Board\* — 5/8 in. thick, 4 ft wide with square or tapered edges. 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 is 4-3/8 in.
- The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
- Through Penetrants — One nonmetallic pipe installed within the firestop system. Pipe to be rigidly supported on both sides of floor or wall assembly. The space between pipe and periphery of opening shall be min 3/4 in. to max 1-1/4 in. Pipe to be rigidly supported on both sides of the floor or wall assembly. The following types and sizes of nonmetallic pipes may be used:
  - Polyvinyl Chloride (PVC) Pipe — Nom 2 in. diam (or smaller) Schedule 40 PVC pipe for use in closed (process or supply) piping system.
  - Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 2 in. diam (or smaller) SDR17 CPVC pipe for use in closed (process or supply) piping systems.
- Fill, Void or Cavity Material\* — Sealant — Installed to completely fill the annular space between the pipes and gypsum wallboard on both sides of wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant  
\*Bearing the UL Classification Mark

**HILTI** Firestop Systems  
Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 09, 2003

**System No. W-L-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**

- 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:
  - Steel Pipe — Nom 30 in diam (or smaller) Schedule 10 (or heavier) steel pipe.
  - Iron Pipe — Nom 30 in. diam (or smaller) cast or ductile iron pipe.
  - Conduit — Nom 4 in diam (or smaller) steel electrical metallic tubing or 6 in. diam steel conduit.
  - Copper Tubing — Nom 6 in. diam (or smaller) Type L (or heavier) copper tubing.
  - Copper Pipe — Nom 6 in. diam (or smaller) regular (or heavier) copper pipe.
- 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

**HILTI** Firestop Systems  
Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. December 4, 2002

**System No. W-L-3065**  
F Ratings — 1 and 2 Hr (See Item 1)  
T Rating — 0 Hr

**SECTION A-A**

- 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 around the perimeter of sleeve on both sides of the wall when sleeve extends beyond surface of wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP601S, CP606, FS-One Sealants or CP618 Putty  
\*Bearing the UL Classification Mark

**HILTI** Firestop Systems  
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**NOTE:**  
THESE DETAILS ARE INCLUDED FOR REFERENCE PURPOSES AND DO NOT INCLUDE ALL APPLICABLE UL SYSTEM TESTED DETAILING TO BE UTILIZED THROUGH OUT THE PROJECT. PROVIDE APPLICABLE UL SYSTEM TESTED DETAILING FOR ALL FIRE RATED AND SMOKE PARTITION PENETRATIONS, WHETHER INDICATED WITHIN THESE DRAWINGS OR NOT.

**CWS ARCHITECTS**  
ARCHITECTURE | INTERIOR DESIGN

264 US Route One Box 6, Suite 100-2A  
Scarborough ME 04074  
OFFICE: 207 774 4441 CWSARCH.COM

**DESIGNER**  
GUY T. LABRECQUE, JR.  
No. 2588  
STATE OF MAINE

**OWNER**  
FAIRPOINT COMMUNICATIONS  
264 US ROUTE ONE  
BOX 6, SUITE 100-2A  
SCARBOROUGH, MAINE 04074  
T: 207 774 4441  
WWW.CWSARCH.COM

**PROJECT**  
5 DAVIS FARM ROAD  
MERGER

**DRAWING**  
UL DESIGN DETAILS

**REVISIONS**

DRAWING NUMBER  
**LS3.02**

SCALE: AS NOTED  
DATE: 1-2-2018

ISSUED FOR PERMITTING