ALL FIRE SHIELD FIRE BARRIER

Project	3884 Progress Ave Unit #104A
Date	09/12/2023
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ALL FIRESHIELD and Insulation, Inc.

ALEXANDER UZAGA 2023

Table of Contents

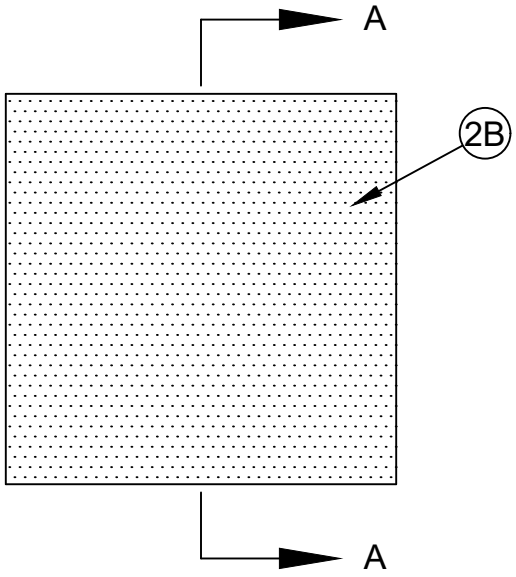
Systems

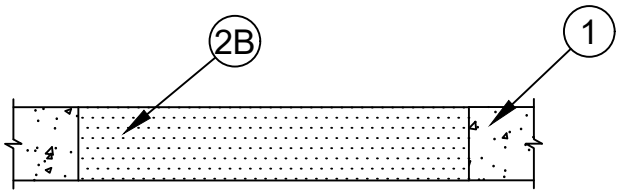
Gypsum wall to metal roof-ceiling assembly. Fiberglass insulation on interior side. Max 2" joint. 100% compression and extension. 1 Hr.

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. C-AJ-0015

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 & 3 Hr (See Item 2B)	F Ratings - 2 and 3 Hr (See Item 2B)
T Rating - 2 & 3 Hr (See Item 2B)	FT Ratings - 2 and 3 Hr (See Item 2B)
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Ratings - 2 and 3 Hr (See Item 2B)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Ratings - 2 and 3 Hr (See Item 2B)
	L Rating At Ambient - Less Than 5.1 L/s/m2
	L Rating At 204 C - Less Than 5.1 L/s/m2





Section A-A

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/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max area of opening is 576 sq in. (0.37 m^2) with max dimension of 24 in. (610 mm). See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. **Firestop System -** The firestop system shall consist of the following:
   A. **Forms -** (Not Shown) - Used as a form to prevent leakage of fill material during installation. Forms to be rigid sheet material, positioned on the bottom surface of the floor or both sides of the wall as required to accommodate the required thickness of fill material. Forms to be removed after fill material has cured.
   B. **Fill, Void or Cavity Materials* - Mortar -** Fill material applied within annulus. Mortar to be mixed with water at a rate of 1.4 parts dry mixture to 1.0 part water by weight in accordance with the installation instructions supplied with the product.
   The F, T, FT, FH, and FTH Ratings of the firestop system are dependent upon the min thickness of fill material and max dimensions of opening as tabulated below:
   SPECIFIED TECHNOLOGIES INC - SpecSeal Mortar

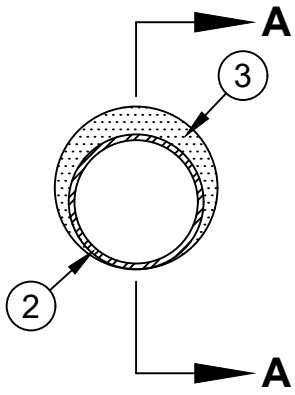
Min Fill Mtl Thkns In.	Max Dimension of Opening In.	F Rating Hr	F, T, FT, FH, FTH Ratings Hr
4-1/2 (114 mm)	24 in. by 24 in. (610mm by 610mm)	3	3
3-1/2 (89 mm)	24 in. by 12 in. (610 mm by 305mm)	2	2

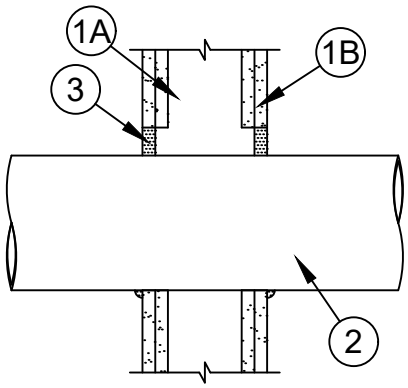
*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. W-L-1049

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 Rating - 0 Hr	FT Rating - 0 Hr
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 Rating - 0 Hr
	L Rating at Ambient - Less Than 5.1 L/S/m2
	L Rating at 204°C - Less Than 5.1 L/S/m2





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 described in the individual U300, V300, 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 3-1/2 in. (89 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* -** 5/8 in. (16 mm) thick, 4 ft (1.22 m) 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, V300, U400, V400 or W400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 38 in. (965 mm) for steel stud walls. Max diam of opening is 14-1/2 in. (368 mm) for wood stud walls.
   The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.

1A. **Metallic Sleeve -** (Optional, Not Shown) - Cylindrical sleeve fabricated from min 0.016 in. (0.41 mm) to max 0.105 in. (2.7 mm) thick sheet steel. Length of steel sleeve to be equal to the thickness of wall. Longitudinal seam of sleeve welded or overlapped min 1 in. (25 mm). The ends of the steel sleeve shall be flush or recessed max 1/4 in. (6 mm) from wall surfaces.

2. **Through Penetrant -** One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. Pipe, conduit or tubing may be installed at an angle not greater than 45 degrees from perpendicular. The annular space between pipe, conduit or tubing and periphery of opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 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 36 in. (914 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. **Iron Pipe -** Nom 36 in. (914 mm) diam (or smaller) cast or ductile iron pipe.
   C. **Conduit -** Nom 6 in. (152 mm) diam (or smaller) rigid steel conduit, nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT) or nom 4 in. (102 mm) diam (or smaller) flexible steel conduit.
   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.
   F. **Stainless Steel Pipe -** Nom 36 in. (914 mm) diam (or smaller) Schedule 10 (or heavier) stainless steel pipe.

2A. **Through Penetrating Product* - Flexible Metal Piping -** As an alternate to Item 2, one nom 2 in. (51 mm) diam (or smaller) steel flexible metal pipe to be installed either concentrically or eccentrically within the firestop system. The annular space between the pipe and the periphery of the opening shall be min 0 in. (point contact) to max 2 in. (51 mm). Pipe to be rigidly supported on both sides of the wall assembly.

OMEGA FLEX INC

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3. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall. At point contact location between through penetrant and gypsum board, a min 3/8 in. (10 mm) diam bead of fill material shall be applied at the gypsum board/through penetrant interface on both surfaces of wall.

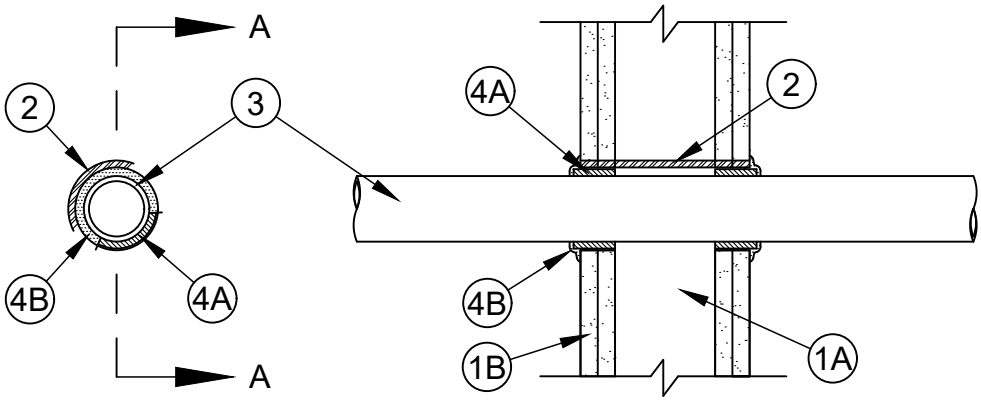
SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant or SpecSeal LCI Sealant

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

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. W-L-2048

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 -1, 1-3/4 and 2 Hr (See Items 2 and 4A)	FT Ratings - 1, 1-3/4 and 2 Hr (See Items 2 and 4A)
L Rating At Ambient - Less Than 1 CFM/ft2	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400°F - Less Than 1 CFM/ft2	FTH Ratings - 1, 1-3/4 and 2 Hr (See Items 2 and 4A)
	L Rating At Ambient - Less Than 5.1 L/s/m2
	L Rating At 204°C - Less Than 5.1 L/s/m2



Section A-A

System tested with a pressure differential of 2.5 Pa between the exposed and the unexposed surfaces with the higher pressure on the exposed side.

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, V300, U400, V400 or W400 Series Wall 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 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.

   B. **Gypsum Board* -** The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300, V300, U400, V400 or W400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 5 in. (127 mm).

   The hourly F and 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 (Optional) -** Nom 3 in. (76 mm) diam (or smaller) Schedule 40 (or thinner) steel pipe friction-fit into wall assembly, flush with both surfaces of wall. **When steel sleeve is used, T, FT and FTH Ratings are 1 hr.**
3. **Through Penetrants -** One nonmetallic pipe or conduit to be centered within the firestop system. The annular space shall be min 1/4 in. (6 mm) to max 1-1/4 in (32 mm). Pipe or conduit to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 3 in. (76 mm) diam (or smaller) Schedule 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 3 in. (76 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.

C. **Rigid Nonmetallic Conduit+ -** Nom 3 in. (76 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA No. 70).

D. **Acrylonitrile Butadiene Styrene (ABS) Pipe -** Nom 3 in. (76 mm) diam (or smaller) Schedule 40 cellular or solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

E. **Flame Retardant Polypropylene (FRPP) Pipe -** Nom 2 in. (51 mm) diam (or smaller) Schedule 40 FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

F . **Polypropylene (PP) Pipe -** Nom 1 in. (25 mm) diam (or smaller) Schedule 80 PP pipe for use in closed (process or supply) piping systems .

G. **Polyvinylidene Fluoride (PVDF) Pipe -** Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVDF pipe for use in closed (process or supply) piping systems .

4. **Firestop System -** The firestop system shall consist of the following:

A. **Fill, Void or Cavity Material* - Wrap Strip -** Nom 1/8 in. (3.2 mm) or 3/16 in. (4.8 mm) thick intumescent material faced on both sides with a plastic film, supplied in 2 in. (51 mm) wide strips or 1/8 or 1/4 in. (3.2 or 6 mm) thick intumescent material faced on both sides with a plastic film, supplied in 1-1/2 in. (38 mm) wide strips. Single layer of wrap strip wrapped around the through penetrant with the ends butted and held in place by means of foil tape. The wrap strip is slid along the through penetrant into annulus such that 1/4 in. (6 mm) of the wrap strip protrudes from the wall. One set of wrap strips to be installed on each side of wall. As an option when 1/8 in. (3.2 mm) thick wrap strip (BLU2) is used, the strips may be cut to a width of 1-1/2 in. (38 mm).

The T, FT and FTH Ratings of the firestop system is dependent upon the hourly rating of the wall, the type of through penetrant and the type of wrap strip used as tabulated below:

Type Of Throught Penetrant	Hourly Rating of Wall Hr	Type of Wrap Strip	T, FT, FTH Rating Hr
PVC, CPVC, PVDF RNC, PP or FRPP	1	SpecSeal BLU, SpecSeal BLU2 or SpecSeal RED, RED2	1
ABS	1	SpecSeal BLU, SpecSeal BLU2 or SpecSeal RED, RED2	1
PVC, CPVC, PVDF RNC, PP or FRPP	2	SpecSeal BLU, SpecSeal BLU2 or SpecSeal RED, RED2	2
ABS	2	SpecSeal BLU or SpecSeal BLU2	2
ABS	2	SpecSeal RED, RED2	1-3/4

SPECIFIED TECHNOLOGIES INC - SpecSeal BLU Wrap Strip, SpecSeal BLU2 Wrap Strip or SpecSeal RED Wrap Strip, SpecSeal RED2 Wrap Strip

B. **Fill, Void or Cavity Material* - Sealant -** When an annular space is present between the wrap strip and the edge of the opening, a min 5/8 in. (16 mm) depth of sealant shall be installed in the annular space flush with each surface of the wall. A min 1/4 in. (6 mm) diam bead of sealant shall be applied at the gypsum board/wrap strip interface on both surfaces of wall.

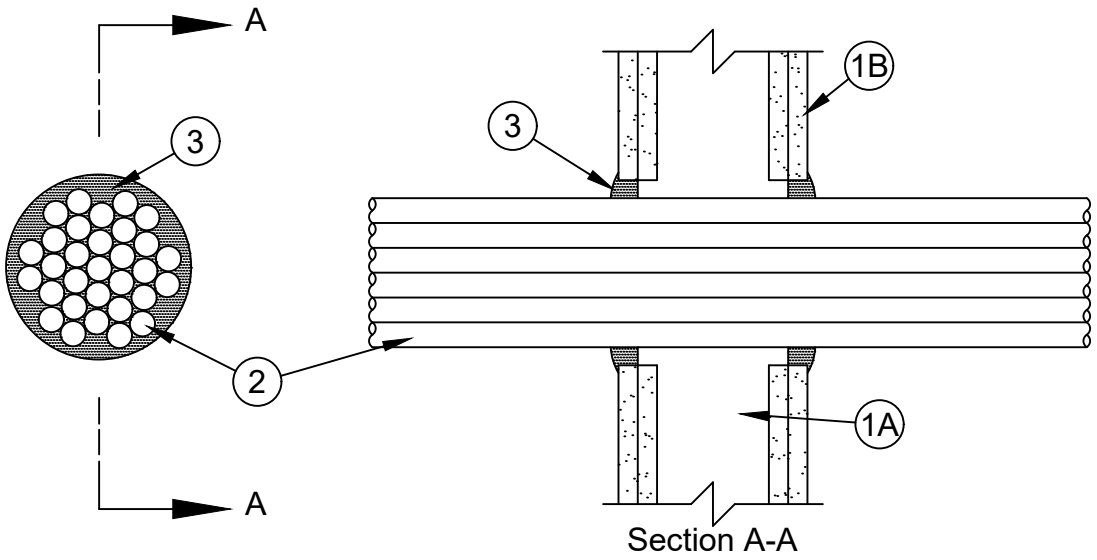
SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LCI Sealant or SpecSeal SIL300 Sealant

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

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. W-L-3076

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 Rating - 0 Hr	FT Rating - 0 Hr
	FH Ratings - 1 and 2 Hr (See Item 1)
	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 or V400 Series Wall and 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 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. **Gypsum Board * -** 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. Diam of circular cutout in gypsum board layers in each side of wall to be 1/2 in. (13 mm) larger than diam of tight cable bundle (Item 2 or 2A). Max diam of opening is 4-1/2 in. (114 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. **Cables -** Max 4 in. (102 mm) diam tight bundle of cables to be installed either concentrically or eccentricity in circular cutouts in gypsum board opening. Cables to be rigidly supported on both sides of wall assembly. The annular space within the firestop system shall be a min 0 in. (point contact) to a max 1/2 in. (13 mm). Any combination of the following types and sizes of cables may be used.
   A. Max 150 pair No. 24 AWG (or smaller) copper conductor cable with polyvinyl chloride (PVC) insulation and jacket.
   B. Max 1/C - 350 kcmil (or smaller) copper conductor cable with cross-linked polyethylene (XLPE) jacket.
   C. Max 2/0 AWG (or smaller) copper conductor cable with a XLPE insulation and PVC jacket.
   D. Max 3/C (with ground) No. 8 AWG nonmetallic sheathed (Romex) cable (or smaller) with copper conductor, polyvinyl chloride (PVC) insulation and jacket materials.
   E. Max 3/C (with ground) No. 2/0 AWG (or smaller) aluminum or copper conductor service entrance cable with PVC insulation and jacket materials.

F. Max 4 pair No. 18 AWG (or smaller) copper conductor thermostat cable with PVC insulation and jacket materials.

G. Max RG/U Type 11 (or smaller) coaxial cable with fluorinated ethylene insulation and jacket materials.

H. Max 62.5/125 micron fiber optic cable with PVC insulation and jacket materials.

2A. **Through penetrating Product* -** As an alternate to the Item 2, a max 4 in. (102 mm) diam tight bundle of max 4 /C (with ground) - No. 2/0 AWG (or smaller) aluminum or steel jacketed **Armored Cable+** or **Metal-Clad Cable+** with aluminum or copper conductors may be used. The annular space between the cable bundle and the periphery of the opening shall be a min of 0 in. (point contact) to a max of 1 in. (25 mm). Through penetrating products may also be used in conjunction with the cables specified in Item 2. The through penetrating products are to be spaced min 1/2 in. (13 mm) from the cable bundle in Item 2. Cables to be rigidly supported on both sides of wall assembly.

AFC CABLE SYSTEMS INC

ENCORE WIRE CORP

3. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall. Fill material to be forced into interstices of cable group to max extent possible. At point contact location, apply min 1/4 in. (6 mm) diam bead of fill material at cable/gypsum board interface on both sides of wall.

SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant or SpecSeal LCI Sealant

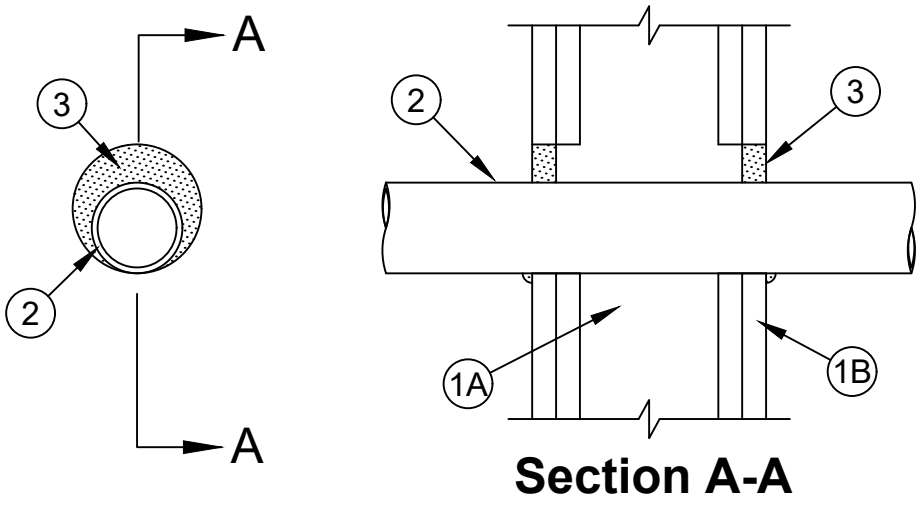
* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

+ Bearing the UL Listing Mark

Classified by
Underwriters Laboratories, Inc.
to ASTM/UL1479 (ASTM E814)

System No. W-L-2241

F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 0, 1/4, 1 and 1-3/4 Hr (See Item 2)
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft



Section A-A

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 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 max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. **Gypsum Board* -** Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Diam of opening to be 1 in. to 1-1/8 in. (25 to 29 mm) larger than outside diam of pipe.

   The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed. When Item 2G or 2H is used, the hourly F Rating is 1 hr.
2. **Through Penetrant -** One nonmetallic pipe, conduit or tube to be installed eccentrically or concentrically within the firestop system. Pipe, conduit or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes, conduits and tubes may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 2 in. (51 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 2 in. (51 mm) diam (or smaller) SDR 13.5 or Schedule 80 CPVC pipe for use in closed (process or supply) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).
   C. **Rigid Nonmetallic Conduit+ -** Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA 70). Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).
   D. **Electrical Nonmetallic Tubing+ -** Nom 2 in. (51 mm) diam (or smaller) PVC tubing installed in accordance with Article 331 of the National Electrical Code (NFPA 70). Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).
   E. **Cross Linked Polyethylene (PEX) Tubing -** Nom 1 in. (25 mm) diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).

F. **Acrylonitrile Butadiene Styrene (ABS) pipe -** Nom 1-1/2 in. (38 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 systems. Annular space shall be min 1/4 in. (6 mm) to max 3/4 in. (19 mm).

G. **Polyvinyl Chloride (PVC) Pipe -** Nom 3 in. (76 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).

H. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 3 in. (76 mm) diam (or smaller) SDR 17 CPVC pipe for use in closed (process or supply) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).

When Item 2A or 2B is used, the T Rating is 1/4 hr. When Item 2C, 2D, or 2E is used, the T Rating is 1 hr and 1-3/4 hr for 1 hr and 2 hr fire rated walls, respectively. When Item 2F, 2G, or 2H is used, T Rating is 0 hr.

3. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At point contact location, min 1/4 in. (6 mm) diam bead of fill material applied at nonmetallic pipe/gypsum board interface on both surfaces of wall.

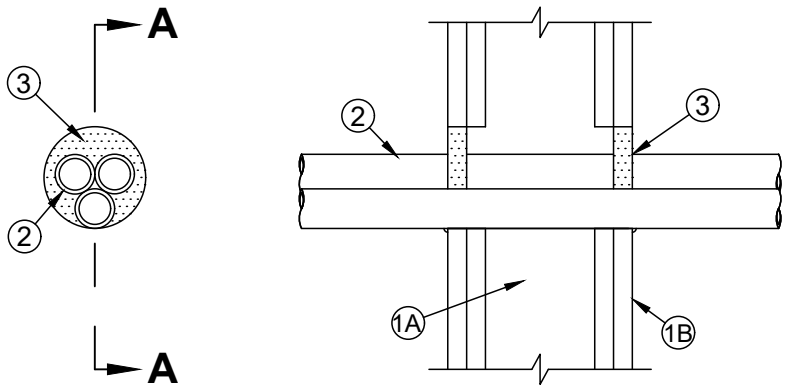
SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant or Type WF300 Firestop Caulk (for wood studs only)

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

Classified by
Underwriters Laboratories, Inc.
to ASTM/UL1479 (ASTM E814)

System No. W-L-2242

F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 1-3/4 Hr (See Item 2)
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft



Section A-A

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 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 3-5/8 in. (92 mm) wide and spaced max 24 in. (610 mm) OC.

   B. **Gypsum Board* -** Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Max diam of opening is 3 in. (76 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 Penetrant -** One or more nonmetallic pipes, conduits or tubes to be bundled together and installed eccentrically or concentrically within the firestop system. Aggregate cross-sectional area of penetrants not to exceed 42 percent of the cross-sectional area of the opening. The annular space between the grounded pipes, conduits or tubes and the periphery of the opening shall be min 0 in. (point contact) to max 1 in. (25 mm). Separation between pipes, conduits or tubes to be min 0 in. (point contact) to max 1 in. (25 mm). Pipes, conduits or tubes to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes, conduits and tubes may be used:

   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 1 in. (25 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems.

   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 1 in. (25 mm) diam (or smaller) SDR17 CPVC pipe for use in closed (process or supply) piping systems.

   C. **Rigid Nonmetallic Conduit+ -** Nom 1 in. (25 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA 70).

   D. **Electrical Nonmetallic Tubing+ -** Nom 1 in. (25 mm) diam (or smaller) PVC tubing installed in accordance with the National Electrical Code (NFPA 70).

   E. **Cross Linked Polyethylene (PEX) Tubing -** Nom 1 in. (25 mm) diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) piping systems.

   The T Rating is 1 hr and 1-3/4 hr for 1 hr and 2 hr fire rated walls, respectively.

3. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. Sealant to be forced into interstices between penetrants to max extent possible. At point contact location, min 1/4 in. (6 mm) diam bead of fill material applied at nonmetallic pipe/gypsum board interface on both surfaces of wall.

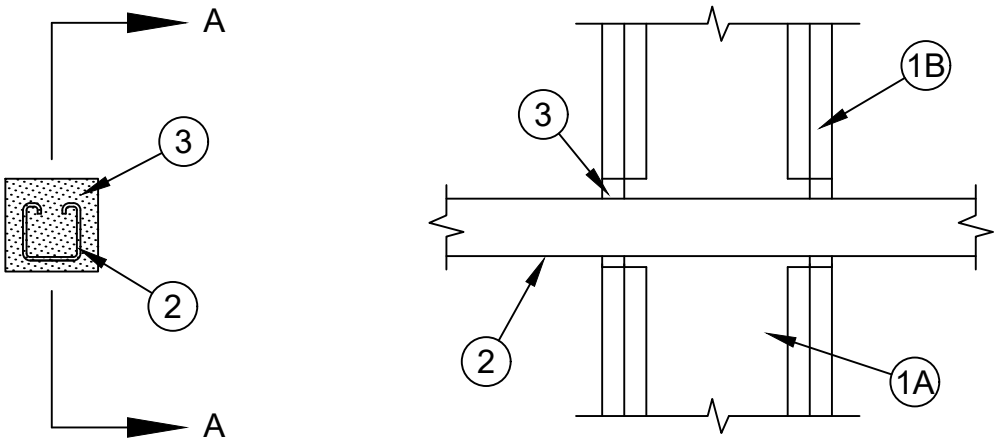
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant or Type WF300 Firestop Caulk (wood stud walls only)

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

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. W-L-7136

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 Rating - 0 Hr	FT Rating - 0 Hr
	FH Ratings - 1 and 2 Hr (See Item 1)
	FTH Rating - 0 Hr



Section A-A

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/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:
   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* -** One or two layers of gypsum board, as specified in the individual Wall and Partition Design. Max diam of opening is 3-3/8 in. (86 mm). Max area of rectangular opening is 16.5 sq in. (106 cm2) with max dimension of 5 in. (127 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 metallic strut, cable or rod service support to be installed within the firestop system. An annular space of min 1/8 in. (3 mm) to max 7/8 in. (22 mm) is required within the firestop system. Strut, cable or rod service support to be rigidly supported on both sides of wall assembly. The strut, cable or rod service support may be installed at an angle not greater than 45 degrees from the perpendicular. The following types and sizes of metallic strut, cable or rod service support may be used:
   A. **Steel Strut -** Max 1-5/8 by 1-5/8 in. (41 by 41 mm) channel strut formed from min 0.105 in. (2.7 mm) thick galv or painted steel.
   B. **Steel Strut -** Max 3-1/4 by 1-5/8 in. (83 by 41 mm) H strut formed from min 0.105 in. (2.7 mm) thick galv or painted steel.
   C. **Cable -** Max 3/8 in. (9.5 mm) diam unjacketed galv steel cable.
   D. **Threaded Rod -** Max 5/8 in. (16 mm) diam galv steel threaded rod.
3. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within the annulus and within the channel struts, flush with both surfaces of wall.

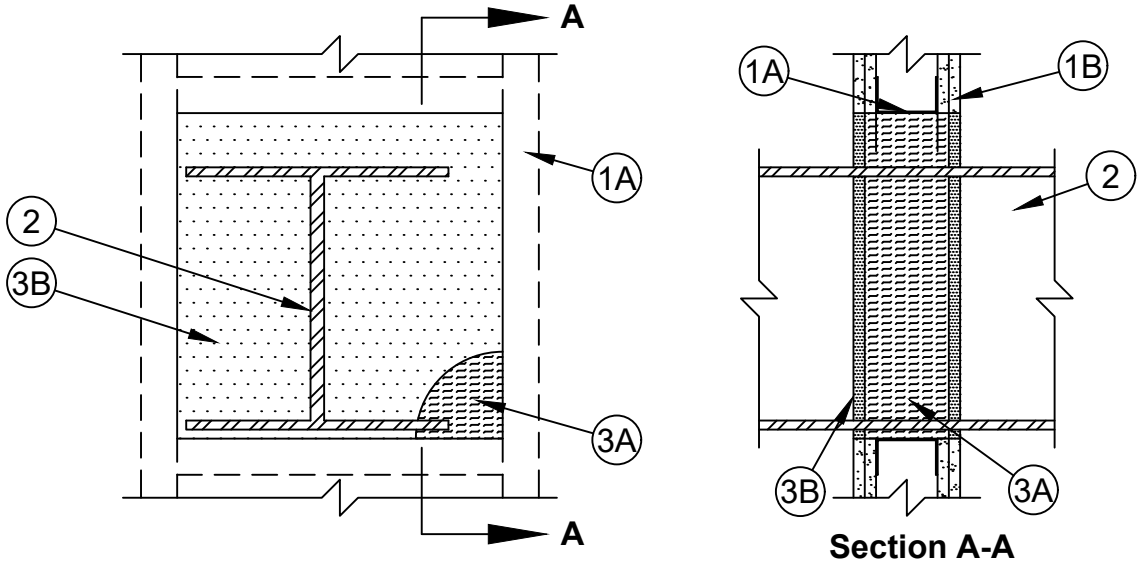
   SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LCI Sealant, SpecSeal LC150 Sealant, SpecSeal LE600 Sealant

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

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. W-L-7186

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 Rating - 0 Hr	FT Rating - 0 Hr
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 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

1. **Wall Assembly -** The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing shall consist of steel channel studs. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC. Opening framed out with steel studs to form a rectangular box around through penetrant.
   B. **Gypsum Board* -** One or two layers of gypsum board, as specified in the individual Wall and Partition Design. Max area of rectangular opening is 324 sq in. (0.21 m2) with max dimension of 18 in. (457 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 Penetrant -** One W14X90 (or smaller) steel beam service support to be installed within the firestop system. An annular space of min 1/2 in. (13 mm) to max 3 in. (76 mm) is required between the steel beam and the periphery of the opening. Steel beam service support to be rigidly supported on both sides of wall assembly.
3. **Firestop System -** The firestop system shall consist of the following items:
   A. **Packing Material -** Mineral wool batt insulation, nom 4 pcf (64 kg/m3), tightly-packed into opening to full depth of wall except for min 5/8 in. (16 mm) recess on each side of wall as required to accommodate fill material (Item 3B).
   B. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied to fill annular space around steel beam flush with each surface of wall.

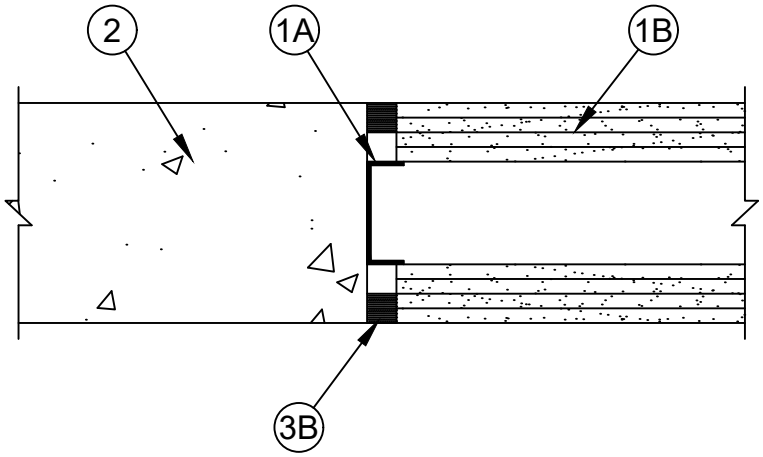
   SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant or SpecSeal LCI Sealant

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

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 2079

System No. WW-S-0052

Assembly Rating - 1, 2, 3 and 4 Hr (See Items 2 and 3B)
Joint Width - 1 In. Max
L Rating At Ambient - Less Than 1 CFM/lin ft
L Rating At 400 °F - Less Than 1 CFM/lin ft

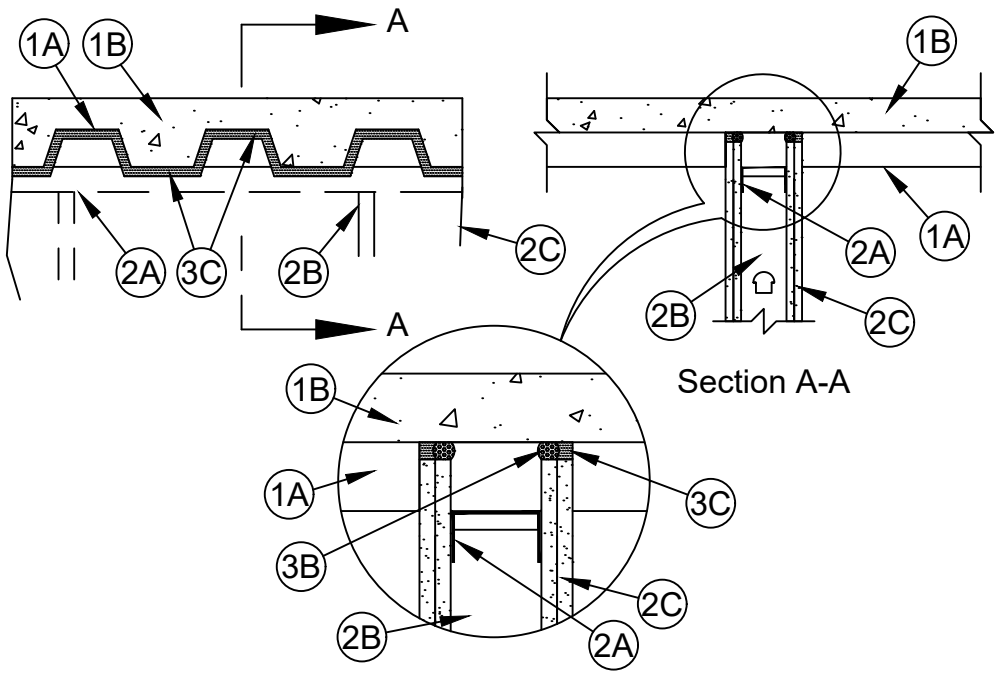


1. **Wall Assembly -** The 1, 2, 3 or 4 hr fire-rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Steel studs to be min 3-1/2 in. (89 mm) wide by 1-1/4 in. (32 mm) deep corrosion protected min 25 MSG steel channels. Stud spacing not to exceed 24 in. (610 mm) OC. Stud installed nominally centered at joint location.
   B. **Gypsum Board* -** Gypsum board sheets installed to a min total thickness of 5/8 in. (16 mm), 1-1/4 in. (32 mm), 1-1/2 in. (38 mm) or 2 in. (51 mm) on each side of wall for 1, 2, 3 and 4 hr fire rated assemblies, respectively. Wall to be constructed in the individual U400 or V400 Series Design in the UL Fire Resistance Directory.
   The hourly rating of the joint system is dependent on the hourly fire rating of the wall assembly in which it is installed.
2. **Wall Assembly -** Min 6 in. (152 mm) thick steel-reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete. When the hourly rating is greater than 3 hr, the min thickness of the wall shall be 7-5/8 in. (194 mm) Wall may also be constructed of any UL Classified **Concrete Blocks***.
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.
3. **Joint System - Max width of joint is 1 in. (25 mm).** The joint system consists of the following:
   A. **Forming Material -** (Optional, Not Shown) - In 2, 3 or 4 hr fire rated wall assemblies, polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction fit into joint opening, flush with both surfaces of wall.
   B. **Fill, Void or Cavity Material* - Sealant -** In 1 hr fire rated wall assemblies, min 5/8 in. (16 mm) thickness of fill material applied within joint opening. In 2, 3 or 4 hr fire rated wall assemblies, min 1 in. (25 mm) thickness of fill material applied within joint opening. Sealant applied on both sides of wall, flush with both surfaces of the wall.
   SPECIFIED TECHNOLOGIES INC - SpecSeal ES Sealant, Pensil 300 Sealant, SpecSeal Series SIL300 Sealant, SpecSeal LC150 or SpecSeal LE600 Sealant.
   Note: When SpecSeal LC150 or LE600 Sealant is used, the max assembly rating is 2 hr.
   * Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 2079

System No. HW-D-0484

Assembly Ratings - 1 and 2 Hr (See Item 2)
Maximum Joint Width - 3/4 in.
Class II Movement Capabilities - 25% Compression



1. **Floor Assembly -** The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:

   A. **Steel Floor And Form Units* -** Max 3 in. (76 mm) deep galv steel fluted floor units.

   B. **Concrete -** Min 2-1/2 in. (64 mm) thick reinforced concrete, as measured from the top plane of the floor units.

   C. **Spray-Applied Fire Resistive Material* -** (Optional, Not Shown) - After installation of the ceiling runner (Item 2A) or deflection channel (Item 3A), steel floor units to be sprayed with a min 5/16 in. (8 mm) to max 11/16 in. (17 mm) thickness of material in accordance with the specifications in the individual D700 or D800 Series Design. When spray applied fire resistive material is used, ceiling runner or deflection channel to be provided with 2 in. (51 mm) flanges. Excess material to be scraped from flanges of ceiling runner or deflection channel prior to installation of gypsum board.

   ISOLATEK INTERNATIONAL - Type 300

   GCP APPLIED TECHNOLOGIES INC - MK-6/HY

1A. **Roof Assembly -** (Not Shown) - As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P700, P800 or P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:

   A. **Steel Roof Deck -** Max 3 in. (76 mm) deep galv steel fluted roof deck.

   B. **Roof Insulation -** Min 2-1/4 in. (57 mm) thick poured insulating concrete, as measured from the top plane of the steel roof deck.

   C. **Roof Covering* -** Hot-mopped or cold-application materials compatible with insulating concrete.

D. **Spray-Applied Fire Resistive Material* -** (Optional, Not Shown) - After installation of the ceiling runner (Item 2A) or deflection channel (Item 3A), steel floor units to be sprayed with a min 5/16 in. (8 mm) to max 11/16 in. (17 mm) thickness of material in accordance with the specifications in the individual P700 or P800 Series Design. When spray applied fire resistive material is used, ceiling runner or deflection channel to be provided with 2 in. (51 mm) flanges. Excess material to be scraped from flanges of ceiling runner or deflection channel prior to installation of gypsum board.

ISOLATEK INTERNATIONAL - Type 300

GCP APPLIED TECHNOLOGIES INC - MK-6/HY

2. **Wall Assembly -** The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

A. **Steel Floor And Ceiling Runners -** Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs . Ceiling runner to be provided with min 1-1/4 in. (32 mm) to max 2 in. (51 mm) flanges. When deflection channel (Item 3A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 1/2 in. (13 mm) to 3/4 in. (19 mm) gap maintained between the top of the ceiling runner and the top of the deflection channel. Ceiling runner secured to valleys with steel masonry anchors or welds spaced max 24 in. (610 mm) OC.

A1. **Light Gauge Framing* - Clipped Ceiling Runner -** As an alternate to the ceiling runner in Item 2A, clipped runner to consist of galv steel channel with clips preformed in track flanges which positively engage the inside flange of the steel studs (Item 2B). Track sized to accommodate steel studs (Item 2B). Track flanges to be min 2-1/2 in. (64 mm) long. Clipped ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors spaced max 24 in. (610 mm) OC. When clipped ceiling runner is used, deflection channel (Item 3A) shall not be used.

TOTAL STEEL SOLUTIONS L L C - Snap Trak

A2. **Light Gauge Framing* - Notched Ceiling Runner -** As an alternate to the ceiling runners in Items 2A and 2A1, notched ceiling runners to consist of C-shaped galv steel channel with notched return flanges sized to accommodate steel studs (Item 2B). Notched ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors spaced max 24 in. (610 mm) OC. When notched ceiling runner is used, deflection channel (Item 3A) shall not be used.

OLMAR SUPPLY INC - Type SCR

A3. **Light Gauge Framing* - Slotted Ceiling Runner -** Slotted ceiling runner may be used as an alternate to the ceiling runner in Item 2A. Slotted ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 3B). Ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors spaced max 24 in. (610 mm) OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.

BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS - SLP-TRK

CEMCO, LLC - CST

CLARKDIETRICH BUILDING SYSTEMS - Type SLT, SLT-H

MARINO/WARE, DIV OF WARE INDUSTRIES INC - Type SLT

METAL-LITE INC - The System

RAM SALES L L C - RAM Slotted Track

B. **Studs -** Steel studs to be min 3-1/2 in. (89 mm) wide. Studs cut 1/2 in. (13 mm) to 3/4 in. (19 mm) less in length than assembly height with bottom nesting in and secured to floor runner. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner with sheet metal screws located 1/2 in. (13 mm) below the bottom of the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment.

C. **Gypsum Board* -** Gypsum board sheets installed to a min total thickness of 5/8 in. (16 mm) and 1-1/4 in. (32 mm) on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that the gypsum board is cut to follow the contour of the steel floor units with a nom 3/4 in. (19 mm) gap maintained between the gypsum board and the steel deck. In addition, the top row of screws shall be installed into the steel studs 1/2 to 1 in. (13 to 25 mm) below the bottom edge of the ceiling runner flange.

The hourly fire rating of the joint system is dependent on the hourly fire rating of the wall assembly in which it is installed.

3. **Joint System -** Max separation between bottom of floor or roof deck and top of wall is 3/4 in. (19 mm). The joint system is designed to accommodate a max 25 percent compression from its installed width. The joint system consists of the following:

   A. **Deflection Channel -** (Optional, Not Shown) - Max 2 in. (51 mm) deep min 24 gauge galv steel channel sized to accommodate ceiling runner (Item 2A). Deflection channel installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors or welds spaced max 24 in. (610 mm) OC. The ceiling runner is installed within the deflection channel to maintain a 1/2 in. (13 mm) to 3/4 in. (19 mm) gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner is not fastened to the deflection channel.

   B. **Forming Material -** (Optional, Not Shown) - In 2 hr fire rated wall assemblies, foam backer rod friction fit into joint opening and recessed minimum 1/2 in. (13 mm) from each surface of wall.

   C. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within joint opening on both sides of wall, flush with both surfaces of wall. As an option in 1 hr fire rated walls, bond breaker tape applied to ceiling channel (Item 2A) or deflection channel (Item 3A) prior to installation of fill material.

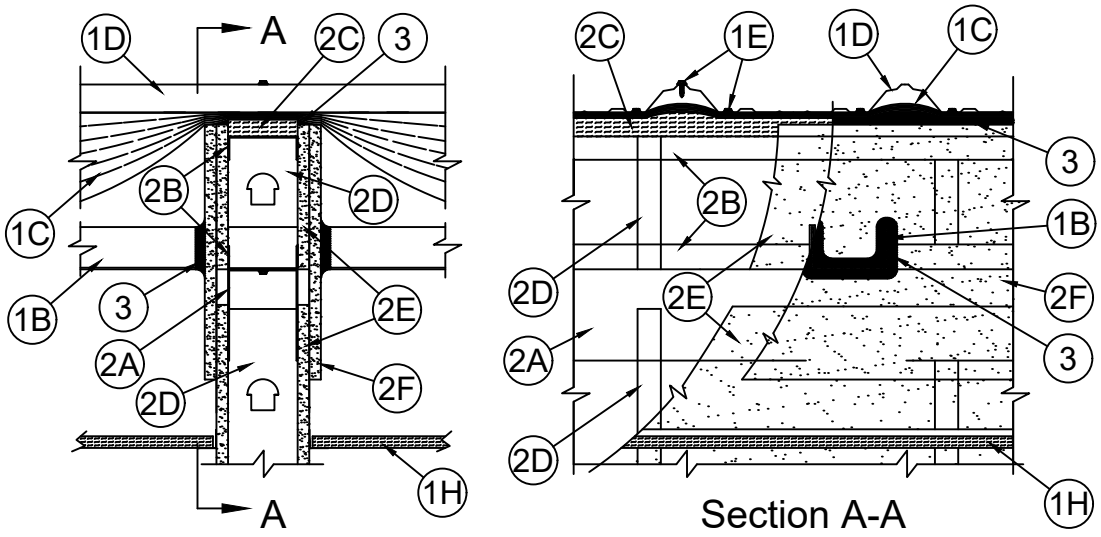
      SPECIFIED TECHNOLOGIES INC - SpecSeal LC150 Sealant, SpecSeal LE600 Sealant

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

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 2079

System No. HW-D-0521

Assembly Rating - 1 Hr
Nominal Joint Width - 2 in.
Class II Movement Capabilities - 100% Compression and Extension



1. **Roof-Ceiling Assembly -** The fire rated roof-ceiling assembly shall be constructed of the materials and in the manner described in the individual P200 or P500 Series **Roof-Ceiling Designs** in the UL Roofing Materials and Systems Directory and shall include the following construction features:

   A. **Purlin -** (Not Shown) - Min 16 ga coated steel. Max spacing as specified in the individual **Roof-Ceiling Design**.

   B. **Lateral Bracing -** Min 16 ga coated steel strap, channel, angle or other structural shape installed where required for lateral support of studs. Attached to steel purlins on each side of wall assembly with welds or with min No. 14 self-tapping, hex-head, plated steel or stainless steel screws.

   C. **Batts and Blankets* - Insulation -** Any faced compressible glass-fiber blanket insulation having a min 6 in. (152 mm) thickness before compression and a min density of 0.6 pcf (9.6 kg/m3). Insulation draped over purlins prior to installation of panel clips (Item 1F) and/or metal roof deck panels (Item 1D). Side edges of the batts shall be butted or overlapped a max of 3 in. (76 mm).

   See **Batts and Blankets** (BZJZ) category in the UL Fire Resistance Directory or **Batts and Blankets** (BKNV) category in the UL Building Materials Directory for names of manufacturers.

   D. **Metal Roof Deck Panels* -** Min 26 ga coated steel. Panels continuous over two or more spans. Roof panel end laps, if required, centered over purlins with min 3 in. (76 mm) panel overlap as specified in the individual **Roof-Ceiling Design**. A line of tube sealant or tape sealant may be used at panel end and side laps.

   See **Metal Roof Deck Panels** (TJPV) category in the UL Roofing Materials and Systems Directory for names of manufacturers.

   E. **Fasteners -** Fasteners used for panel-to-purlin and panel-to-panel connections to be self-tapping, hex-head, plated steel or stainless steel screws with either an integral or a separate steel washer fitted with a compressible sealing washer. Fastener type, length, pilot hole diam and spacing to be as specified in the individual **Roof-Ceiling Design**.

   F. **Roof Deck Fasteners* - Panel Clips -** (Not Shown) - Panel clips used for panel-to-purlin connections to be secured to purlin through insulation as specified in the individual **Roof-Ceiling Design**.

   See **Roof Deck Fasteners** (TLSX) category in the UL Roofing Materials and Systems Directory for names of manufacturers.

   G. **Thermal Spacer Blocks -** (Not Shown) - Expanded polystyrene strips cut to fit between panel clips (Item 1F) as specified in the individual **Roof-Ceiling Design**. Thermal spacer blocks, when used, are to be installed between insulation (Item 1C) and metal roof deck panels (Item 1D) over purlins.

H. **Ceiling Membrane - The Steel Framing Members*, Acoustical Material*, Gypsum Board*** and other ceiling membrane components shall be as specified in the individual **Roof-Ceiling Design.**

2. **Wall Assembly -** The 1 h fire-rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 or V400 Series **Wall and Partition Design** in the UL Fire Resistance Directory and shall include the following construction features:

   A. **Ceiling Deflection Channel -** U-shaped channel formed from min 16 ga steel sized to accommodate steel studs (Item 2D) and provided with 5 in. (127 mm) flanges. Deflection channel installed parallel with and between purlins and secured to lateral bracing (Item 1B) with min No. 14 self-tapping, hex-head, plated steel or stainless steel screws.

   B. **Steel Floor and Ceiling Runners -** Floor runner of the wall assembly and the floor and ceiling runners of the cripple wall above the wall assembly shall consist of min 1-1/4 in. (32 mm) deep min 25 ga galv steel channels sized to accommodate steel studs (Item 2D). Floor runner of cripple wall aligned with and screw-attached to top of ceiling deflection channel. Ceiling runner of cripple wall installed to compress insulation (Item 1C) and packing material (Item 2C) to min thickness of 3/8 in. (10 mm) and 1 in. (25 mm), respectively, by wedging lengths of stud (Item 2D) between the runners. Steel studs of cripple wall attached to floor and ceiling runners with steel screws.

   C. **Batts and Blankets* - Packing Material -** Unfaced compressible mineral wool batt insulation having a nom 2 in. (51 mm) thickness before compression and a nom density of 4 pcf (64 kg/m3). Strips of nom 2 in. (51 mm) thick batt cut to width of cripple wall ceiling runner and compressed min 50 percent in thickness between cripple wall ceiling runner and insulation (Item 1C). Compression of mineral wool batt packing material to result in compression of insulation (Item 1C) to nominal 3/8 in. (10 mm) thickness. When width of metal roof deck panels (Item 1D) rib exceeds 2 in. (51 mm).

      See **Batts and Blankets** (BZJZ) category in the UL Fire Resistance Directory or **Batts and Blankets** (BKNV)category in the UL Building Materials Directory for names of manufacturers.

   D. **Studs -** Steel studs to be min 3-1/2 in. (89 mm) wide. Studs cut max 2 in. (51 mm) less in length than assembly height beneath purlins with bottom nesting in and resting on the floor runner and with top nesting in ceiling deflection channel without attachment. Stud spacing not to exceed 24 in. (610 mm) O.C. Studs of cripple wall cut to length as required to compress packing material (Item 2C) and insulation (Item 1C) to min thicknesses of 1 in. (25 mm) and 3/8 in. (10 mm), respectively. Studs spaced max 24 in. (610 mm) OC.

   E. **Gypsum Board* -** Min 5/8 in. (16 mm) thick gypsum board sheets installed on each side of wall. Wall to be constructed as specified in the individual U400 or V400 Series Design in the UL Fire Resistance Directory except that a max 2 in. wide gap shall be maintained between the gypsum board of the wall assembly and the gypsum board of the cripple wall. Top edge of gypsum board of wall assembly to be max 2 in. (51 mm) below top of ceiling deflection channel. Bottom edge of cripple wall gypsum board to be flush with top of ceiling deflection channel. Screws securing gypsum board to steel studs of wall assembly to be located 2-1/4 in. to 2-1/2 in. (57 to 64 mm) below flange of ceiling deflection channel. Screws securing gypsum board of cripple wall to be driven into studs and runners of cripple wall. No screws are to be driven into flanges of ceiling deflection channel.

   F. **Gypsum Board* -** Min 5/8 in. (16 mm) thick "rip strip" of gypsum board installed to cover first layer of gypsum board on cripple wall and to lap min 3 in. (76 mm) onto gypsum board of wall assembly on each side of wall. The "rip strip" of gypsum board is to be the same material used for the wall assembly and is to be secured to the studs and runners of the cripple wall. No screws are to be driven into flanges of ceiling deflection channel. Joints of "rip strip" to be offset from joints of gypsum board on wall assembly.

      Max separation between top of wall assembly gypsum board and bottom of cripple wall gypsum board (at time of installation of joint system) is 2 in. (51 mm). The joint system is designed to accommodate a max 100 percent compression or extension from its installed width.

3. **Fill, Void or Cavity Material* - Caulk -** Min 5/8 in. (16 mm) thickness of fill material installed to fill any gap between top of cripple wall gypsum board and insulation (Item 1C) on each side of the wall. Additional caulk installed to fill annular space between lateral bracing and gypsum board "rip strip" (Item 2F) on both sides of wall. Additional nom 1/2 in. (13 mm) diam bead of caulk to be applied around perimeter of lateral brace at its interface with the "rip strip" on each side of the wall.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

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