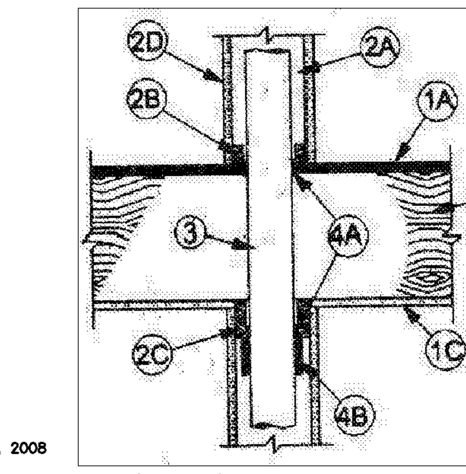
UL SYSTEM F-C-2030



May 23, 2008

F Ratings – 1 and 2 Hr (See tem 1)
T Ratings – 0, 3/4, 1, 1–1/2 and 2 Hr (See Item 3)

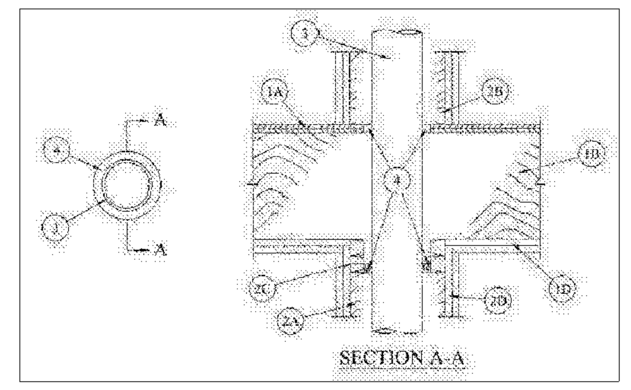
1. Floor–Ceiling Assembly – The 1 or 2 hr fire–rated solid or trussed lumber joist floor–ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor–Ceiling Designs in the UL Fire Resistance Directory. The F Rating of the firestop system is equal to the rating of the floor–ceiling and wall assemblies. The general construction features of the floor–ceiling assembly are summarized below:
A. Flooring System – Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor–Ceiling Design. Diam of opening shall be 1 in. (25 mm) larger than the nom diam of through–penetrant (Item 3).
B. Joists – Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with end firestopped.
C. Gypsum Board* – Thickness, type, number of layers and fasteners shall be as specified in the individual Floor–Ceiling Design. Diam of opening shall be 1 in. (25 mm) larger than the nom diam of through–penetrant (Item 3).
D. Furring Channels – (Not Shown) (As required) – Resilient galvanized steel furring installed in accordance with the manner specified in the individual L500 Series Designs in the Fire Resistance Directory.

2. Chase Wall – (Optional) – The through penetrant (Item 3) may be routed through a 1 or 2 hr fire–rated single, double or staggered wood stud/gypsum wallboard chase wall having a fire rating consistent with that of the floor–ceiling assembly. The chase wall shall be constructed of the materials and in the manner specified in the individual U300 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
A. Studs – Nom 2 by 6 in. (51 by 152 mm) or double nom 2 by 4 in. (51 by 102 mm) lumber studs.
B. Sole Plate – Nom 2 by 6 in. (51 by 152 mm) (or larger) or parallel 2 by 4 in. (51 by 102 mm) lumber plates, tightly butted. Diam of opening shall be 1 in. (25 mm) larger than the nom diam of through–penetrant (Item 3).
C. Top Plate – The double top plate shall consist of two nom 2 by 6 in. (51 by 152 mm) (or larger) or parallel 2 by 4 in. (51 by 102 mm) lumber plates, tightly butted. Diam of opening shall be 1 in. (25 mm) larger than the nom diam of through–penetrant (Item 3).
D. Gypsum Board* – Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design.

3. Through–Penetrants – One nom 1–1/2 in. (38 mm), 2 in. (51 mm), 3 in. (76 mm) or 4 in. (102 mm) diam nonmetallic pipe to be installed within the firestop system. Diam of opening through flooring system and through sole and top plates of chase wall to be max 2–1/8 in. (54 mm), 2–5/8 in. (67 mm), 4 in. (102 mm) or 5 in. (127 mm) for nom 1–1/2 in. (38 mm), 2 in. (51 mm), 3 in. (76 mm) or 4 in. (102 mm) diam nonmetallic pipe sizes, respectively. Pipe to be rigidly supported on both sides of the floor–ceiling assembly. The T Rating is dependent on the size of the through–penetrant. For 2 hr rated assemblies, the T Rating is 2 hr for 1–1/2 in. (38 mm) diam (and smaller) pipes and 1–1/2 hr for pipes greater than 1–1/2 in. (38 mm) diam. For 1 hr rated assemblies, the T rating is 1 hr for 1–1/2 in. (38 mm) diam (and smaller) pipes, 3/4 hr for 2 in. (51 mm) diam pipes and 0 hr for pipes greater than 2 in. (51 mm) diam. The following types of nonmetallic pipes may be used:
A. Polyvinyl Chloride (PVC) Pipe – 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 – SDR17 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
C. Acrylonitrile Butadiene Styrene (ABS) pipe – Schedule 40 solid–core or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
D. Flame Retardant Polypropylene(FRPP) Pipe – Schedule 40 FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.

4. Firestop System – The details of the firestop system shall be as follows:
A. Fill, Void or Cavity Material* – Sealant – Min 3/4 in. (19 mm) thickness of fill material to be installed within the annular space between the pipe and the flooring (Item 1A) or sole plate. Min 5/8 in. (16 mm) thickness applied within the annular space, flush with the bottom surface of ceiling or lower top plate.
HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC – FS–ONE Sealant
B. 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 underside of ceiling or chase wall top plate (Item 2C) using the anchor hooks provided with the collar. (Minimum 2 anchor hooks for 1–1/2 (38 mm) and 2 in. (51 mm) diam pipes and 3 anchor hooks for 3 in. (76 mm) diam pipes). The anchor hooks are to be secured to the ceiling with min 3/16 in. (5 mm) diam steel toggler bolts or to the chase wall top plate with min No. 12 by min 1 in. (25 mm) long steel wood screws in conjunction with steel washers.
HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC – CP 643 50/1.5"N, CP643 63/2"N, CP 643 90/3"N or CP643 110/4"N Firestop Collar
*Bearing the UL Classification Mark

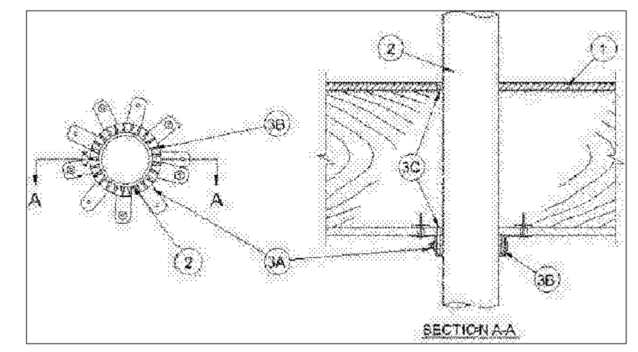
UL SYSTEM F-C-1009



DECEMBER 27, 2013
F RATING - 1 AND 2 HR (SEE ITEM 1)
T RATING - 1/4 HR
L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT
L RATING AT 400 F - 4 CFM/SQFT

1.Floor-Ceiling Assembly — The 1 or 2 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The F Rating of the firestop system is equal to the rating of the floor-ceiling assembly. The general construction features of the floor-ceiling assembly are summarized below:
A. Flooring System — Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor-Ceiling Design. Diam of opening to be max 1 in. larger than diam of pipe. As an alternate, the opening may be square-cut with a max dimension 1 in. greater than the diam of the pipe.
B.Wood Joists* — Nom 10 in. deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped.
C. Furring Channels — (Not Shown) —(As required) Resilient galvanized steel furring installed in accordance with the manner specified in the individual L500 Series Designs in the Fire Resistance Directory.
D. Gypsum Board* — Thickness, type, number of layers and fasteners shall be as specified in the individual Floor-Ceiling Design. Diam of opening to be max 1 in. larger than diam of pipe.
2.Chase Wall — (Optional) - The through penetrant (Item 3) may be routed through a 1 or 2 hr fire-rated single, double or staggered wood stud/gypsum board chase wall having a fire rating consistent with that of the floor-ceiling assembly. Depth of chase wall to be min 1 in. greater than the diameter of the through penetrant. The chase wall shall be constructed of the materials and in the manner specified in the individual U300 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
A. Studs — Nom 2 by 4 in., 2 by 6 in. or double nom 2 by 4 in. lumber studs. Nom 2 by 4 in. studs are allowed for through-penetrants (Item 3) not exceeding nom 2 in. diam.
B.Sole Plate — Nom 2 by 4 in., 2 by 6 in. or parallel 2 by 4 in. lumber plates, tightly butted. Diam of opening is to be max 1 in. larger than diam of pipe. As an alternate, the opening may be square-cut with a max dimension 1 in. greater than the diam of the pipe. Plates may be discontinuous over opening, terminating at two opposing edges of opening. Max length of discontinuity to be 1 in. greater than diam of through penetrant.
C. Top Plate — The double top plate shall consist of two nom 2 by 4 in., 2 by 6 in. or two sets of parallel 2 by 4 in. lumber plates, tightly butted. Diam of opening is to be max 1 in. larger than diam of pipe. As an alternate, the opening may be square-cut with a max dimension 1 in. greater than the diam of the pipe. Plates may be discontinuous over opening, terminating at two opposing edges of opening. Max length of discontinuity to be 1 in. greater than diam of through penetrant.
D. Steel Plate — When lumber plates are discontinuous, nom 1-1/2 in. wide No. 20 gauge (or heavier) galv steel plates shall be installed to connect each discontinuous lumber plate and to provide a form for the fill material. Steel plates sized to lap 2 in. onto each discontinuous lumber plate and secured to lumber plates with steel screws or nails.
E.Gypsum Board* — Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design.
3.Through Penetrants — One metallic pipe, conduit or tubing to be installed within the firestop system. Pipe, conduit or tubing to be rigidly supported on both sides of floor assembly. The annular space within the firestop system shall be min 0 in. (point contact) to max 1 in.. The following types and sizes of metallic pipes or conduits may be used:
A. Steel Pipe — Nom 4 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
B.Iron Pipe — Nom 4 in. diam (or smaller) cast or ductile iron pipe.
C. Conduit — Nom 4 in. diam (or smaller) steel electrical metallic tubing or steel conduit.
D. Copper Tubing — Nom 4 in. diam (or smaller) Type L (or heavier) copper tubing.
E.Copper Pipe — Nom 4 in. diam (or smaller) Regular (or heavier) copper pipe.
4.Fill, Void or Cavity Material* — Sealant — Min 3/4 in. thickness of fill material applied within the annulus, flush with the top surface of the floor or the sole plate. Min 5/8 in. thickness of fill material applied within the annulus, flush with bottom surface of ceiling or lower top plate.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP601S, CFS-S SIL GG, CP606 or FS-One Sealant.
(Note: L Ratings apply only when FS-ONE Sealant is used.)
*Bearing the UL Classification Mark

UL SYSTEM F-C-2232



March 09, 2009

F Rating – 1 Hr
T Rating – 3/4 and 1 Hr (See Item 3)

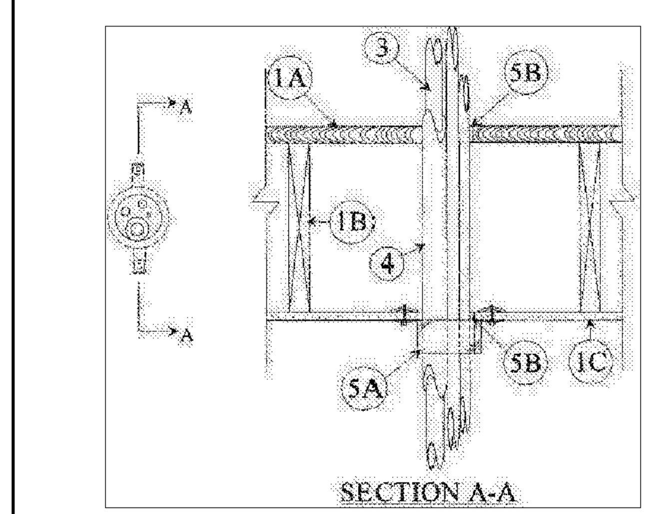
1. Floor–Ceiling Assembly – The 1 hr fire–rated solid or trussed lumber joist floor–ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor–Ceiling Designs in the UL Fire Resistance Directory. The general construction features of the floor–ceiling assembly are summarized below:
A. Flooring System – Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor–Ceiling Design. Max diam of opening shall be 5 in.
B. Wood Joists* – Nom 10 in. deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped.
C. Gypsum Board* – Nom 5/8 in. thick, 4 ft wide as specified in the individual Floor–Ceiling Design. Max diam of opening shall be 5 in.
2. Through Penetrants – One nonmetallic pipe or conduit to be installed concentrically or eccentrically within the firestop system. Annular space between pipe or conduit and edge of opening to be min 0 in. (point contact) and max 1/2 in. Pipe or conduit to be rigidly supported on both sides of floor–ceiling assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
A. Polyvinyl Chloride (PVC) Pipe – Nom 4 in. 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.
B. Chlorinated Polyvinyl Chloride (CPVC) Pipe – Nom 4 in. diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
C. Acrylonitrile Butadiene Styrene (ABS) Pipe – Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid–core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
3. Nonmetallic Pipe Coupling – (Optional) Nom 4 in. (102 mm) diam (or smaller) Schedule 40 PVC, Schedule 40 ABS or SDR13.5 CPVC coupling corresponding to pipe type installed such that the top of the coupling is flush with the bottom surface of the ceiling and extending downward.
4. Firestop System – The firestop system shall consist of the following:
A. Fill, Void or Cavity Material* – Wrap Strip – Nom 3/16 in. thick by 1–3/4 in. wide intumescent wrap strip. Layers of wrap strip continuously wrapped around the pipe and held in place with tape. Wrap strip butted tightly against surface of ceiling.
HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC – CP648–E W45/1–3/4" Wrap Strip

Nom Diam of Pipe, In.	Number of Wrap Strips	Min/Max Annular Space, In.	T Rating – Hr
2	1	0–1/4	1
3	2	0–1/2	3/4
4	2	0–1/2	3/4

B. Steel Collar – Collar fabricated from coils of precut min 0.017 in. thick (No. 28 MSG) galv steel available from the sealant manufacturer. Collar shall be nom 1–3/4 in. deep with 1 in. wide by 2 in. long anchors tabs on 2 in. centers for securement to floor/ceiling assembly. The opposite side incorporates retainer tabs, 1/2 in. wide by 3/16 in. long, prebent toward the pipe surface. Collar shall be tightly wrapped over the wrap strip, overlapping min. 1 in at seam. A nom 1/2 in. wide stainless steel hose clamp shall be secured to the collar at its mid–height. Every other anchor tab of collar secured to gypsum ceiling with 1/4 in. diam by 1–1/2 in. long steel toggle bolts in conjunction with ¼ in by ⅝in diameter steel washers.
C. Fill, Void or Cavity Materials*–Sealant – Min 5/8 in. thickness of fill material applied within the annulus, flush with the bottom surface of the gypsum board ceiling. Min 5/8 in. thickness of fill material applied within the annulus, flush with the top surface of the floor. When ABS pipe is installed at point contact, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe/floor interface on top surface of floor.
HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC – FS–ONE Sealant

4A. Firestop System – (Optional, Not shown) As an option to Item 4, the firestop system shall consist of the following:
A. Firestop Device* – Galv steel collar lined with an intumescent material sized to fit the specific diam of pipe shall be installed in accordance with the accompanying installation instructions. Collar to be installed and latched around the pipe and secured to the gypsum board ceiling with ¼ in. diam by 1–1/2 in. long steel toggle bolts with – in. diam steel washers through hanger tabs provided.
HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC – CP 643 50/1.5"N, CP 643 63/2"N, CP 643 90/3"N or CP 643 110/4"N Firestop Collar.
B. Fill, Void or Cavity Materials*–Sealant – Min 5/8 in. thickness of fill material applied within the annulus, flush with the bottom surface of the gypsum board ceiling. Min 5/8 in. thickness of fill material applied within the annulus, flush with the top surface of the floor. When ABS pipe is installed at point contact, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe/floor interface, flush with top surface of floor.
HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC – FS–ONE Sealant
*Bearing the UL Classification Mark

UL SYSTEM F-C-8009



May 23, 2008

F Rating – 1 Hr
T Rating – 1 Hr

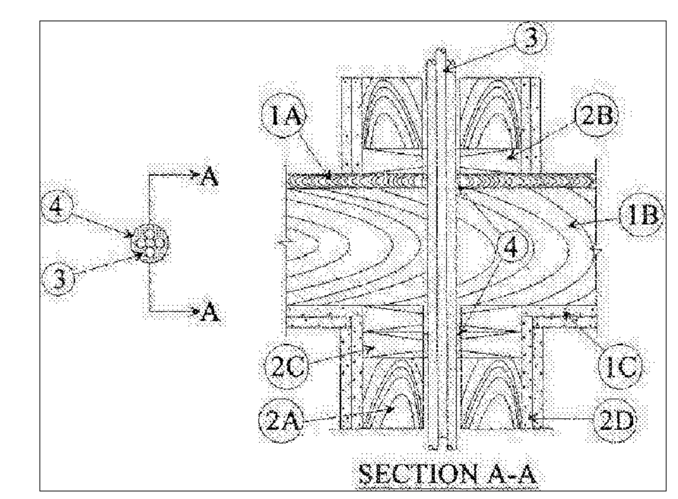
1. Floor–Ceiling Assembly – The 1 hr fire–rated wood joist floor–ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor–Ceiling Designs in the UL Fire Resistance Directory, as summarized below:
A. Flooring System – Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor–Ceiling Design. Max diam of opening is 3 in. (76 mm).
B. Wood Joists – Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped.
C. Gypsum Board* – Thickness, type, number of layers and fasteners shall be as specified in the individual Floor–Ceiling Design. Max diam of opening in ceiling [when chase wall (item 2) is not provided] is 3 in. (76 mm).
2. Chase Wall – (Optional, Not Shown) – The through penetrant (Item 3) may be routed through a 1 hr fire–rated single, double or staggered wood stud/gypsum wallboard chase wall constructed of the materials and in the manner specified in the individual U300 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
A. Studs – Nom 2 by 6 in. (51 by 152 mm) lumber or double nom 2 by 4 in. (51 by 102 mm) lumber studs.
B. Sole Plate – Nom 2 by 6 in. (51 by 152 mm) lumber or parallel 2 by 4 in. (51 by 102 mm) lumber plates, tightly butted. Max diam of opening shall be 3 in. (76 mm).
C. Top Plate – The double top plate shall consist of two nom 2 by 6 in. (51 by 152 mm) lumber plates or 2 sets of parallel nom 2 by 4 in. (51 by 102 mm) lumber, tightly butted. Max diam of opening is 3 in. (76 mm).
D. Gypsum Board* – Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design.
3. Through Penetrants – Pipe, cable and tubing to be bundled and rigidly supported on both sides of floor assembly. A nom annular space of min 0 in. (point contact) to max 1/2 in. (13 mm) is required within the firestop system. The following types and sizes of pipe, cable and tubing are to be used in the firestop system in sufficient quantities to fill the firestop device:
A. Type PJT thermoset cable, 5/C No. 18 AWG copper conductor, plastic insulation and jacket.
B. Polyvinyl Chloride (PVC) Pipe – Nom 1–1/2 in. (38 mm) diam (or smaller) Schedule 40 solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
C. Copper Tubing – Nom 3/4 in. (19 mm) diam (or smaller) Type L (or heavier) copper tubing.
D. Copper Tubing – Nom 1/2 in. (13 mm) diam (or smaller) Type L (or heavier) copper tubing.
4. Tube Insulation – Plastics+ – Nom 1/2 in. (13 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. Insulation to be installed only on one through reverant having a max nom diam of 3/4 in. (19 mm).
See Plastics+ (QMFZ2) category in the Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL94 Flammability Classification of 94–5VA may be used.

5. Firestop System – The firestop system shall consist of the following:
A. Firestop Device* – Firestop Collar – Firestop collar shall be installed in accordance with the accompanying installation instructions. Collar to be installed and latched around the penetrants and secured to underside of gypsum wallboard ceiling using the anchor hooks provided with the collar. The anchor hooks are to be secured to the surface of the ceiling with min 3/16 in. diam min 2–1/2 in. long toggle bolts.
HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC – CP 64–3 90/3"N, CP 64–3 63/2"N, CP 64–3 50/1–1/2"N .
B. Fill, Void or Cavity Material* – Sealant – Min 3/4 in. (19 mm) thickness of fill material applied within the annulus, flush with top surface of floor or sole plate. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with bottom surface of ceiling or lower top plate. Caulk to be forced into interstices of penetration group to max extent possible at top surface of floor or sole plate and bottom surface of ceiling or lower top plate.
HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC – FS611A or FS–ONE Sealant

+Bearing the UL Recognized Component Mark

*Bearing the UL Classification Marking

UL SYSTEM F-C-3012



December 23, 2008

F Ratings – 1 and 2 Hr (See Item 1)
T Ratings – 0, 1 and 1–3/4 Hr (See Item 3)

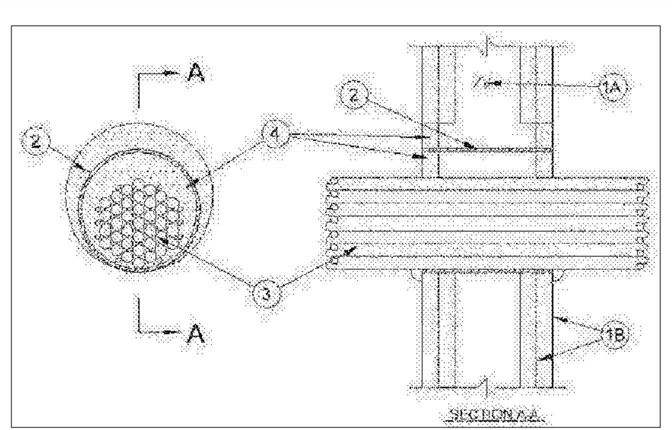
1. Floor–Ceiling Assembly – The 1 or 2 hr fire–rated solid or trussed lumber joist floor–ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor–Ceiling Designs in the UL Fire Resistance Directory. The general construction features of the floor–ceiling assembly are summarized below:
A. Flooring System – Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor–Ceiling Design. Max diam of opening for 1 or 2 hr assembly is 2–1/2 in. (64 mm) or 2 in. (51 mm), respectively.
B. Wood Joists* – Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped.
C. Furring Channels – (Not Shown) – (As required) – Resilient galvanized steel furring installed in accordance with the manner specified in the individual L500 Series Designs in the Fire Resistance Directory.
D. Gypsum Board* – Thickness, type, number of layers and fasteners shall be as specified in the individual Floor–Ceiling Design. Max diam of opening for 1 or 2 hr assembly is 2–1/2 in. (64 mm) or 2 in. (51 mm), respectively.
The F Rating of the firestop system is equal to the rating of the floor–ceiling assembly.

2. Chase Wall – (Optional) – The through penetrant (Item 3) shall be routed through a fire–rated single, double or staggered wood stud/gypsum wallboard chase wall having a fire rating consistent with that of the floor–ceiling assembly. The chase wall shall be constructed of the materials and in the manner specified in the individual U300 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
A. Studs – Nom 2 by 6 in. (51 by 152 mm) or double nom 2 by 4 in. (51 by 102 mm) lumber studs.
B. Sole Plate – Nom 2 by 6 in. (51 by 152 mm) or parallel 2 by 4 in. (51 by 102 mm) lumber plates, tightly butted. Max diam of opening for 1 or 2 hr rated assembly is 2–1/2 in. (64 mm) or 2 in. (51 mm), respectively.
C. Top Plate – The double top plate shall consist of two nom 2 by 6 in. (51 by 152 mm) or two sets of parallel 2 by 4 in. (51 by 102 mm) lumber plates, tightly butted. Max diam of opening for 1 or 2 hr rated assembly is 2–1/2 in. (64 mm) or 2 in. (51 mm), respectively.
D. Gypsum Board* – Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design.
3. Cables – In 1 hr fire–rated assemblies, aggregate cross–sectional area of cables in opening to be max 45 percent of the cross–sectional area of the opening (max 2 in. (51 mm) diam bundle). Cables to be rigidly supported on both sides of floor assembly. Any combination of the following types and sizes of copper conductors may be used:
A. RG 59 coaxial cable with single copper conductor, cellular polyethylene cellular foam insulation and polyvinyl chloride (PVC) jacket.
B. Max 8/C No. 22 AWG telephone cable with polyvinyl chloride (PVC) jacketing.
C. Max 2/C No. 12 AWG cable with polyvinyl chloride (PVC) insulation and jacketing.
D. Max 3/C with ground No. 2/0 AWG aluminum or copper Type SER cable with polyvinyl chloride (PVC) insulation.
E. Max 3/C with ground No. 2/0 AWG Type NM cable with polyvinyl chloride (PVC) insulation.
F. Max 3/C No. 12 AWG MC (BX) cable with polyvinyl chloride (PVC) insulation.
G. Max 1 in. diam metal clad TEK cable with PVC jacket.
H. Max 4/C with ground No. 300 kcmil (or smaller) aluminum SER cable with PVC insulation and jacket.
I. Through Penetrating Product* – Any cables, Metal–Clad Cable+ or Armored Cable+ currently Classified under the Through Penetrating Products category.
See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers.
The T Rating is 1 and 1–3/4 hr for 1 and 2 hr rated assemblies, respectively, for cables 3A through 3G. The T Rating is 0 hr for cables 3H and 3I.

4. Fill, Void or Cavity Material* – Sealant – Min 3/4 in. (19 mm) thickness of fill material applied within the annulus, flush with top surface of floor or sole plate. Min 5/8 in. (16 mm) thickness of fill material also applied within the annulus, flush with bottom surface of ceiling or lower top plate.
HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC – FS611A Sealant or FS–One Sealant

*Bearing the UL Classification Mark

UL SYSTEM W-L-3065

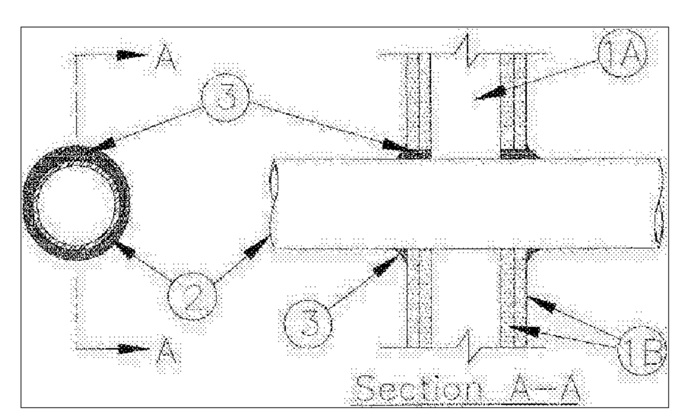


FEBRUARY 06, 2014
F RATING - 1 AND 2 HR (SEE ITEM 1)
T RATING - 0 AND 3/4 HR (SEE ITEM 3)
L RATING AT AMBIENT - 15 CFM/SQ FT
L RATING AT 400 F - 8 CFM/SQFT

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 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 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 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.
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.
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. Cable bundle, using cables described below, may penetrate the wall at an angle not greater than 45 degrees. 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 rating is ¾ hr for a 2 hr wall assembly.
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 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.
*Bearing the UL Classification Mark

+Bearing the UL Listing Mark

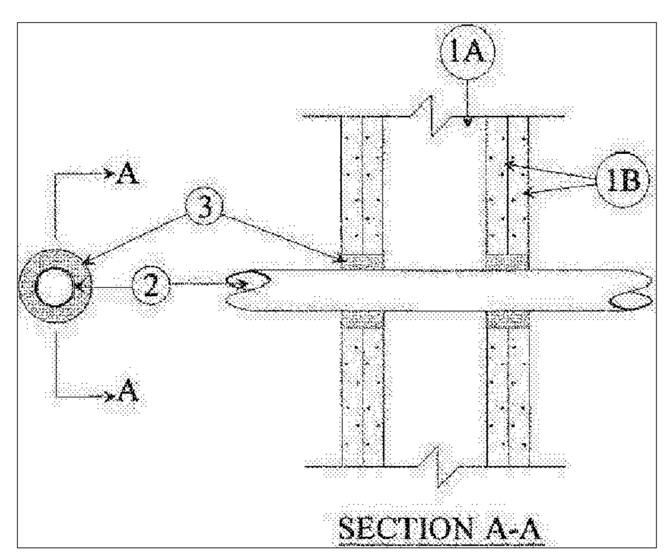
UL SYSTEM W-L-1085



System No. W–L–1085
November 24, 1999
F Ratings –– 1 and 2 Hr (See Item 1B)
T Rating –– 0 Hr
L Rating At Ambient –– Less Than 1 CFM/Sq Ft
L Rating At 400 F –– 4 CFM/Sq Ft

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 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:
A. 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.
B. Gypsum Board* –– 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum wallboard type, number of layers, fastener type and sheet orientation shall be as specified in the individual Wall and Partition Design. Max diam of opening is 13–1/4 in.
Diam of circular opening cut through gypsum wallboard on each side of wall assembly to be min 1/4 in. to max 1/2 in. larger than outside diam of through penetrant (Item 2). 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 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 wall assembly. The annular space between the through–penetrant and the periphery of the opening shall be min 0 in. to max 1/4 in. The following types and sizes of metallic pipes, conduits or tubing may be used:
A. Steel Pipe –– Nom 12 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
B. Iron Pipe –– Nom 12 in. diam (or smaller) cast or ductile iron pipe.
C. Conduit –– Nom 6 in. diam (or smaller) steel electrical metallic tubing or steel conduit.
D. Copper Tubing –– Nom 6 in. diam (or smaller) Type L (or heavier) copper tubing.
E. Copper Pipe –– Nom 6 in. diam (or smaller) Regular (or heavier) copper pipe.
3. Fill, Void or Cavity Material* –– Sealant –– Fill material to be forced into the annulus to maximum extent possible. Additional fill material to be installed such that a min 1/2 in. crown is formed around the penetrating item and lapping 1/4 in. beyond the periphery of the opening.
HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC –– FS–One Sealant
*Bearing the UL Classification Mark

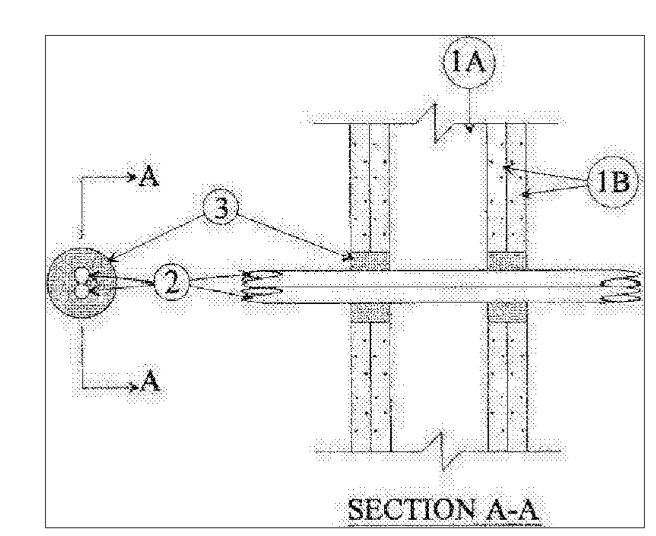
UL SYSTEM W-L-2098



System No. W–L–2098
January 09, 2003
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

1. 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:
A. 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.
B. Gypsum Board* –– 5/8 in. thick, 4 ft wide with square or tappered 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.
2. 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:
A. Polyvinyl Chloride (PVC) Pipe –– Nom 2 in. diam (or smaller) Schedule 40 PVC pipe for use in closed (process or supply) piping system.
B. Chlorinated Polyvinyl Chloride (CPVC) Pipe –– Nom 2 in. diam (or smaller) SDR17 CPVC pipe for use in closed (process or supply) piping systems.
3. Fill, Void or Cavity Materials* –– 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

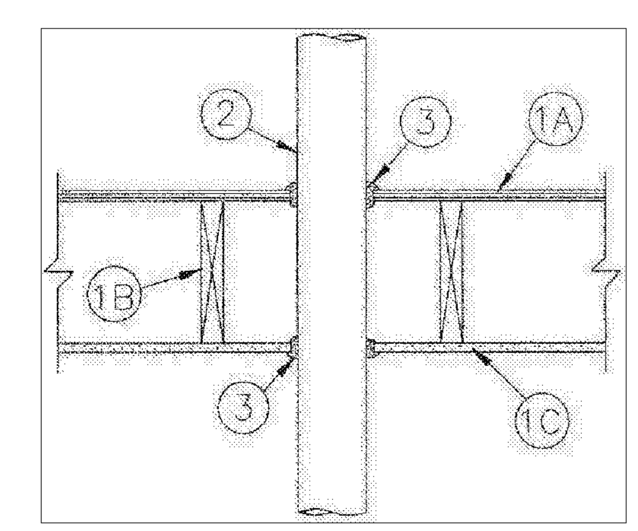
UL SYSTEM W-L-3071



System No. W–L–3071
January 09, 2003
F Ratings –– 1 and 2 Hr (See Item 1)
T Ratings –– 1/4 and 3/4 Hr (See Item 1)
L Rating At Ambient –– Less Than 1 CFM/Sq Ft
L Rating At 400 F –– 4 CFM/Sq Ft

1. 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.
A. 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.
B. Gypsum Board* –– 5/8 in. thick, 4 ft wide with square or tappered 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 3 in. The hourly F rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.
The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed. The hourly T Rating of the firestop system is 1/4 and 3/4 hr for 1 and 2 hr rated wall assemblies, respectively.
2. Cables –– Max two 3/C with ground No. 2/0 AWG aluminum or copper Type SER cable with polyvinyl chloride (PVC) insulation. Cable to be rigidly supported on both sides of wall assembly. The annular space between the cables and the periphery of opening shall be min 1/2 in. to max 1–1/2 in.
3. Fill, Void or Cavity Material* –– Sealant –– Installed to completely fill the annular space between the cables and gypsum wallboard on both sides of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC –– FS–One Sealant
*Bearing the UL Classification Mark

UL SYSTEM F-C-7001



System No. F–C–7001
September 03, 2004
(Formerly System No. 169)
F Rating –– 1 Hr
T Rating –– 1/2 Hr

1. Floor–Ceiling Assembly –– The 1 hr fire–rated wood joist floor–ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor–Ceiling Designs in the UL Fire Resistance Directory, as summarized below:
A. Flooring System –– Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor–Ceiling Design. Max diam of opening is 11 in.
B. Wood Joists –– Nom 2 by 10 in. lumber joists spaced 16 in. OC with nom 1 by 3 in. lumber bridging and with ends firestopped.
C. Gypsum Board* –– Nom 4 ft wide by 5/8 in. thick as specified in the individual Floor–Ceiling Design. Max diam of opening is 11 in.
1.1 Chase Wall –– (Optional, not shown) –– The through penetrants (Item No. 2) shall be routed through a 1 hr fire–rated single, double or staggered wood stud/gypsum wallboard chase wall constructed of the materials and in the manner specified in the individual U300 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
A. Studs –– Nom 2 by 6 in. or double nom 2 by 4 in. lumber studs.
B. Sole Plate –– Nom 2 by 6 in. or parallel 2 by 4 in. lumber plates, tightly butted.
C. Top Plate –– The double top plate shall consist of two nom 2 by 6 in. or two sets of parallel 2 by 4 in. lumber plates, tightly butted. Max diam of opening is 5 in.
D. Gypsum Board* –– Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design.
2. Steel Vent Duct –– Nom 4 in. diam (or smaller) No. 30 gauge (or heavier) galv steel vent duct or nom 10 in. diam (or smaller) No. 28 gauge (or Heavier) galv steel vent duct. Diam of openings to be max 1 in. larger than outside diam of duct. Duct to be installed approx midway between wood joists and installed either concentrically or eccentrically in opening. The annular space between the duct and the periphery of opening shall be min 0 in. (point contact) to max 1 in. Duct to be rigidly supported on both sides of floor–ceiling assembly.
3. Fill, Void or Cavity Materials* –– Caulk or Sealant –– Min 3/4 in. thickness of fill material applied within the annulus, flush with top surface of floor or sole plate. Min 5/8 in. thickness of fill material applied within the annulus, flush with bottom surface of ceiling or top plate. An additional min 1/4 in. crown of fill material applied to perimeter of duct at its egress from the top of flooring and underside of ceiling or from top of sole plate and underside of top plate.
3M COMPANY –– CP 25WB+ or FB–3000 WT
*Bearing the UL Classification Mark

PHILLIPS

Phone 770.394.1616 Fax 770.394.1314

CONSULTANT

SEAL

ISSUE & REVISION RECORD

#	DATE	DESCRIPTION
	07/07/14	BID SET

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PROJECT

SPRINGS AT FREMAUX TOWN CENTER
SLIDELL, LA

CLIENT

CONTINENTAL PROPERTIES
CONTINENTAL 294 FUND LLC
W134 N8675 EXECUTIVE PARKWAY
MENOMONEE FALLS, WI 53051
262.502.5500 * FAX 262.502.5522

PHILLIPS JOB NUMBER 1333104

ISSUE DATE 07/07/14

DRAWN BY/CHECKED BY ATL/DEB

DRAWING TITLE

UL PENETRATION DETAILS

SHEET NUMBER

G0.60

NORTH TERRACES
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