

**System No. F-C-0002**

| ANSI/UL1479 (ASTM E814)            | CANULC S115                          |
|------------------------------------|--------------------------------------|
| F Rating — 1 and 2 Hr (See Item 1) | F Rating — 1 and 2 Hr (See Item 1)   |
| T Rating — 1 and 2 Hr (See Item 1) | FT Rating — 1 and 2 Hr (See Item 1)  |
|                                    | FH Rating — 1 and 2 Hr (See Item 1)  |
|                                    | FTH Rating — 1 and 2 Hr (See Item 1) |

**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:

- 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 floor opening is 1 in. (25 mm).
- 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 freestopped.
- Furring Channels — (Not Shown) — Resilient galv steel furring installed perpendicular to wood joists between board and wood joists as required in the individual Floor-Ceiling Design. Furring channels spaced max 24 in. (610 mm) OC.
- Gypsum Board\* — Nom 4 ft (122 cm) wide by 5/8 in. (16 mm) thick as specified in the individual Floor-Ceiling Design. Gypsum board secured to wood joists or furring channels as specified in the individual Floor-Ceiling Design. Max diam of opening is 1 in. (25 mm). The F, FH and T, FT, FTH Ratings of the freestop system are equal to the hourly fire rating of the floor-ceiling assembly in which it is installed.

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**2. Chase Wall** — (Optional) — The 1 or 2 hr fire-rated single, double or staggered wood stud/gypsum board 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:

- Studs — Nom 2 by 4 in. or 2 by 6 in. (51 by 102 or 51 by 152 mm) lumber studs.
- Sole Plate — Nom 2 by 4 in. or 2 by 6 in. (51 by 102 or 51 by 152 mm) lumber plates.
- Top Plate — The double top plate shall consist of two nom 2 by 4 in. or 2 by 6 in. (51 by 102 or 51 by 152 mm) lumber plates. Max diam of opening is 1 in.
- Gypsum Board\* — Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design.

**3. Fill, Void or Cavity Material** — Sealant — Min 3/4 in. (19 mm) thickness of fill material applied within the annulus on top surface of floor or sole plate of chase wall. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus. Flush with the bottom surface of the ceiling or lower top plate.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC. — FS-ONE Sealant, FS-ONE MAX Intumescent Sealant or CP606 Sealant.

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

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**System No. F-C-1009**

| ANSI/UL1479 (ASTM E814)                     | CANULC S115                                 |
|---|---|
| F Rating — 1 and 2 Hr (See Item 1)          | F Rating — 1 and 2 Hr (See Item 1)          |
| T Rating — 1/4 Hr                           | FT Rating — 1/4 Hr                          |
| L Rating At Ambient — Less Than 1 CFM/sq ft | FH Rating — 1 and 2 Hr (See Item 1)         |
| L Rating At 400 F — 4 CFM/sq ft             | FTH Rating — 1/4 Hr                         |
|   | L Rating At Ambient — Less Than 1 CFM/sq ft |
|   | L Rating At 400 F — 4 CFM/sq ft             |

**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 freestop system is equal to the rating of the floor-ceiling assembly. The general construction features of the floor-ceiling assembly are summarized below:

- 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 floor opening to be max 1 in. (25 mm) larger than diam of pipe. As an alternate, the opening may be square-cut with a max dimension 1 in. (25 mm) greater than the diam of the pipe.
- 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 freestopped.
- 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.
- 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. (25 mm) larger than diam of pipe.

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**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:

- Studs — Nom 2 by 4 in. (51 by 102 mm), 2 by 6 in. (51 by 152 mm) or double nom 2 by 4 in. (51 by 102 mm) lumber studs. Nom 2 by 4 in. (51 by 102 mm) studs are allowed for through-penetrants (Item 3) not exceeding nom 2 in. (51 mm) diam.
- Sole Plate — Nom 2 by 4 in. (51 by 102 mm), 2 by 6 in. (51 by 152 mm) or parallel 2 by 4 in. (51 by 102 mm) lumber plates, tightly butted. Diam of opening is to be max 1 in. (25 mm) larger than diam of pipe. As an alternate, the opening may be square-cut with a max dimension 1 in. (25 mm) greater than the diam of pipe. Plates may be discontinuous over opening, terminating at two opposing edges of opening. Max length of discontinuity to be 1 in. (25 mm) greater than diam of through penetrant.
- Top Plate — The double top plate shall consist of two nom 2 by 4 in. (51 by 102 mm), 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. Diam of opening is to be max 1 in. (25 mm) larger than diam of pipe. Plates may be discontinuous over opening, terminating at two opposing edges of opening. Max length of discontinuity to be 1 in. (25 mm) greater than diam of through penetrant.
- Steel Plate — When lumber plates are discontinuous, nom 1-1/2 in. (38 mm) wide No. 20 gage (or heavier) galv steel plates shall be installed to connect each discontinuous lumber plate and to provide a form for the fill. Steel plates shall be lap 2 in. (51 mm) onto each discontinuous lumber plate and secured to lumber plates with steel screws or nails.
- 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 in the firestop system. The pipe, conduit or tubing to be rigidly supported on both sides of floor assembly. The annular space with the firestop system shall be min 1/4 in. (point contact) to max 1 in. (25 mm). The following types and sizes of metallic pipes or conduits may be used:

- Steel Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe.
- Iron Pipe — Nom 4 in. (102 mm) diam (or smaller) cast or ductile iron pipe.
- Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or non-metallic (or smaller) steel conduit.
- Copper Tubing — Nom (102 mm) 4 in. diam (or smaller) Type L (or heavier) copper tubing.
- Copper Pipe — Nom (102 mm) 4 in. diam (or smaller) Type L (or heavier) copper pipe.

**4. Fill, Void or Cavity Material** — Sealant — Min 3/4 in. (19 mm) thickness of fill material applied within the annulus. Flush with the top surface of the floor or the 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.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC. — CP601S, CFS-S SIL GG, CP606, FS-One Sealant or FS-ONE MAX Intumescent Sealant (Note: L Ratings apply only when FS-ONE Sealant is used).

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

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**System No. F-C-1059**

| ANSI/UL1479 (ASTM E814)                     | CANULC S115                                 |
|---|---|
| F Rating — 1 and 2 Hr                       | F Rating — 1 and 2 Hr                       |
| T Rating — 1 and 2 Hr                       | FT Rating — 1 and 2 Hr                      |
| L Rating At Ambient — Less Than 1 CFM/sq ft | FH Rating — 1 and 2 Hr                      |
| L Rating At 400 F — 4 CFM/sq ft             | FTH Rating — 1 and 2 Hr                     |
| W Rating — Class 1 (See Item 4)             | L Rating At Ambient — Less Than 1 CFM/sq ft |
|   | L Rating At 400 F — 4 CFM/sq ft             |

**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 freestop system is equal to the rating of the floor-ceiling and wall assemblies. The T, FT and FTH Rating of the freestop system shall be equal to the rating of the floor-ceiling and wall assemblies. The general construction features of the floor-ceiling assembly are summarized below:

- 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 7-5/8 in. (194 mm).
- 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 freestopped.
- Gypsum Board\* — Thickness, type, number of layers and fasteners shall be as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 7-5/8 in. (194 mm).
- 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.

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**System No. F-C-1059**

**1.1 Chase Wall** — (Not Shown, Optional) — The through penetrants (Item 2) 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:

- Studs — Nom 2 by 8 in. (51 by 203 mm) lumber or double nom 2 by 6 in. (51 by 152 mm) lumber studs.
- Sole Plate — Nom 2 by 8 in. (51 by 203 mm) lumber or parallel 2 by 6 in. (51 by 152 mm) lumber plates, tightly butted. Max diam of opening shall be 7-5/8 in. (194 mm).
- Top Plate — The double top plate shall consist of two nom 2 by 8 in. (51 by 203 mm) lumber plates or two sets of nom 2 by 6 in. (51 by 152 mm) lumber plates tightly butted. Max diam of opening is 7-5/8 in. (194 mm).
- Gypsum Board\* — Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design.

**2. Through Penetrants** — One metallic tubing, pipe or conduit to be installed concentrically or eccentrically in the freestop system. Annular space between pipe or conduit and edge of opening to be min 1/4 in. (6 mm) and max 3/4 in. (19 mm). Pipe, tubing or conduit to be rigidly supported on both sides of floor-ceiling assembly. The following types and sizes of metallic pipes, tubing or conduit may be used:

- Steel Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe.
- Iron Pipe — Nom 6 in. (152 mm) diam (or smaller) cast or ductile pipe.
- Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or non-metallic (or smaller) steel conduit.
- Steel Flexible Metal Conduit\* — Nom 2 in. (51 mm) diam (or smaller) steel flexible metal conduit.

See Flexible Metal Conduit (DXU) category in the Electrical Construction Materials Directory for names of manufacturers.

**3. Fill, Void or Cavity Material** — Sealant — Min 5/8 in. (16 mm) or 3/4 in. (19 mm) thickness of sealant applied within annular space, flush with the bottom surface of gypsum wallboard or lower top plate. Min 3/4 in. (19 mm) thickness of sealant applied within annular space, flush with top surface of floor or sole plate. Min 5/8 in. (16 mm) thickness of sealant applied within annular space, flush with bottom surface of ceiling or lower top plate. Min 3/4 in. (19 mm) thickness of sealant applied within annular space, flush with bottom surface of ceiling or lower top plate. Min 5/8 in. (16 mm) thickness of sealant applied within annular space, flush with bottom surface of ceiling or lower top plate. Min 3/4 in. (19 mm) thickness of sealant applied within annular space, flush with bottom surface of ceiling or lower top plate.

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

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

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**System No. F-C-2030**

**F Ratings — 1 and 2 Hr (See Item 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 freestop 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:

- 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 1 in. (25 mm) larger than the nom diam of through-penetrant (Item 3).
- 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 freestopped.
- Gypsum Board\* — Thickness, type, number of layers and fasteners shall be as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 1 in. (25 mm) larger than the nom diam of through-penetrant (Item 3).
- 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.

**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.**

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**System No. F-C-2030**

**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:

- Studs — Nom 2 by 6 in. (51 by 152 mm) or double nom 2 by 4 in. (51 by 102 mm) lumber studs.
- 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).
- 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).
- 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 freestop 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:

- 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.
- Chlorinated Polyvinyl Chloride (CPVC) Pipe — SDR17 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
- 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.
- 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:

- 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.
- 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 toggle 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.

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

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**Order Plans**

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**HILTI FIRESTOP DETAILS**

**HOLIDAY INN EXPRESS & SUITES**

INTERSECTION OF HAYNES PLACE & LAMM RD.  
WILSON, NC 27893

STATUS: BIDDING

PROJ. DATE: 06-07-19

PROJ. NO: 18-176

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DRAWN BY: RFF

CHECKED BY: TGC

SHEET NO. **A905**

SCALE: 1/2" = 1'-0"

