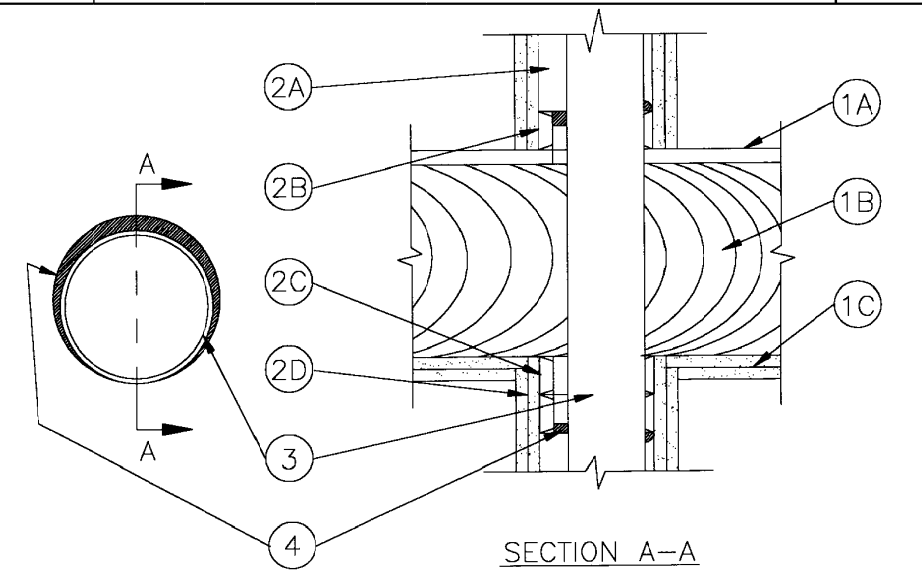


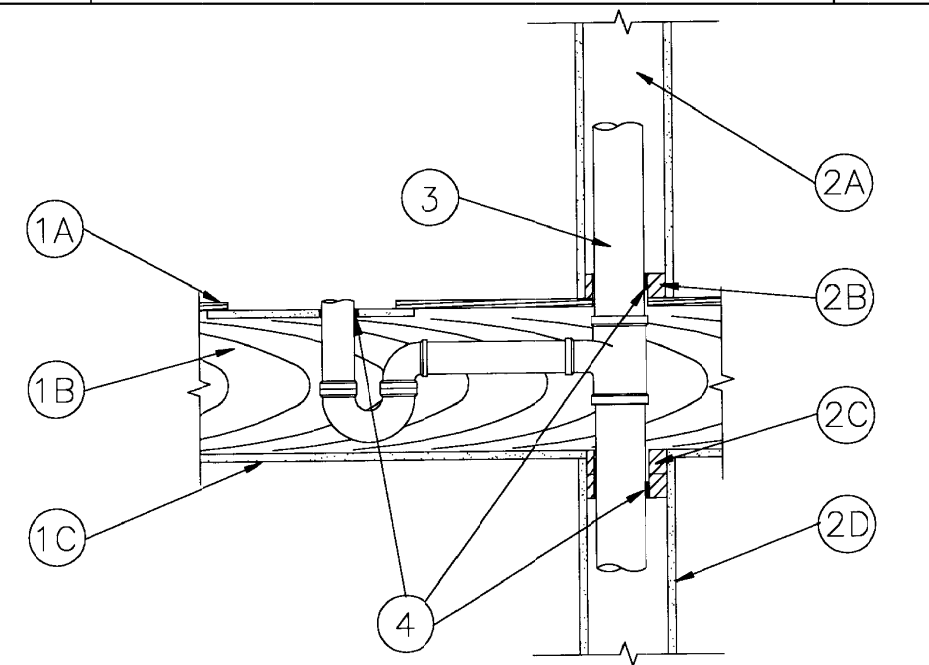
**F Rating - 2 Hr**  
**T Rating - 2 Hr**  
**F-C-2093**



- Floor-Ceiling Assembly** The 2 hr fire-rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design Nos. L500, L511 or L536 in the UL Fire Resistance Directory, as 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 is 5-1/4 in.
  - Wood Joists\*** - Nom 10 in. deep (or deeper) lumber joists spaced 16 in. OC with bridging as required and with ends firestopped.
  - Wallboard, Gypsum\*** - Nom 4 ft wide by 5/8 in. thick as specified in the individual Floor-Ceiling Design. First layer of wallboard nailed to wood joists. Second layer of wallboard screw attached to furring channels.
- Chase Wall** The through penetrants (Item 2) are routed through a 2 hr fire-rated single, double or staggered wood stud/gypsum wallboard chase wall constructed of the material 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. or double 2 by 4 in. lumber studs.
  - Sole Plate** - Nom 2 by 6 in. or parallel 2 by 4 in. lumber plates, tightly butted. Max diam of opening is 5-1/4 in.
  - 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 5-1/4 in.
  - Wallboard, Gypsum\*** - Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design.

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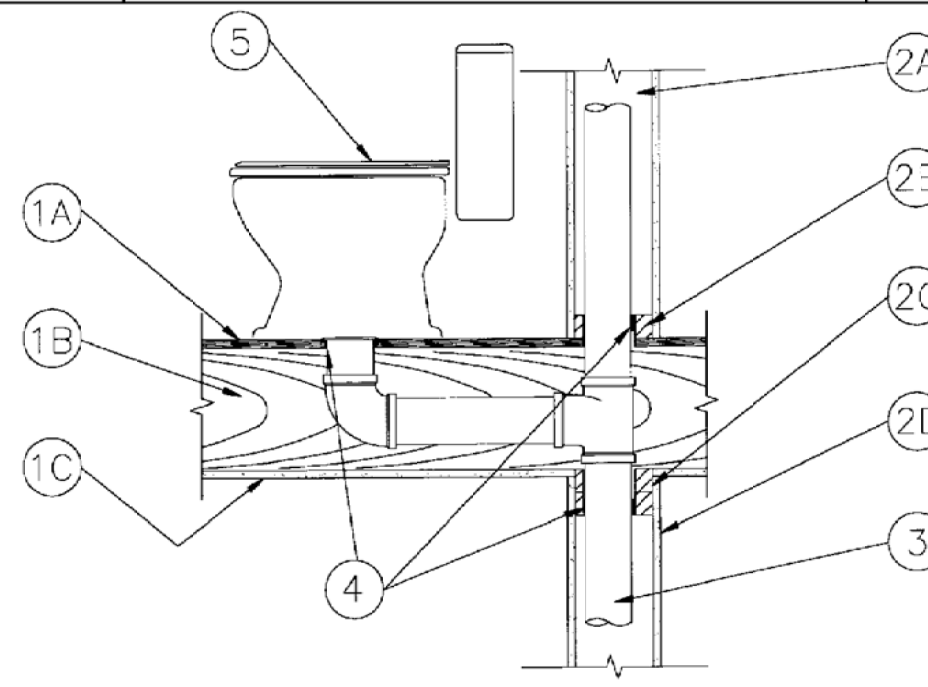
**F Rating - 1 Hr**  
**T Rating - 3/4 Hr**  
**F-C-2094**



- 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 as 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. Rectangular cutout in flooring to be max 6 by 12 in.
  - 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.
  - Wallboard, Gypsum\*** - Nom 4 ft wide by 5/8 in. thick as specified in the individual Floor-Ceiling Design. Wallboard nailed to wood joists. Wallboard plate used at opening in floor sized to overlap opening by a min 1 in. on all sides and shall be screw attached to underside of flooring with drywall or wood screws spaced a max of 4 in. OC. Max diam of opening is 3 in.
- Chase Wall** - The through penetrants (Item 3) are routed through a 1 hr fire-rated single, double or staggered wood stud/gypsum wallboard chase wall constructed of the material 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. or double 2 by 4 in. lumber studs.
  - Sole Plate** - Nom 2 by 6 in. or parallel 2 by 4 in. lumber plates, tightly butted. Max diam of opening is 3 in.
  - Top Plate** - The double top plate shall consist of two 2 by 6 in. or two sets of parallel 2 by 4 in. lumber plates, tightly butted. Max diam of opening is 3 in.
  - Wallboard, Gypsum\*** - Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design.

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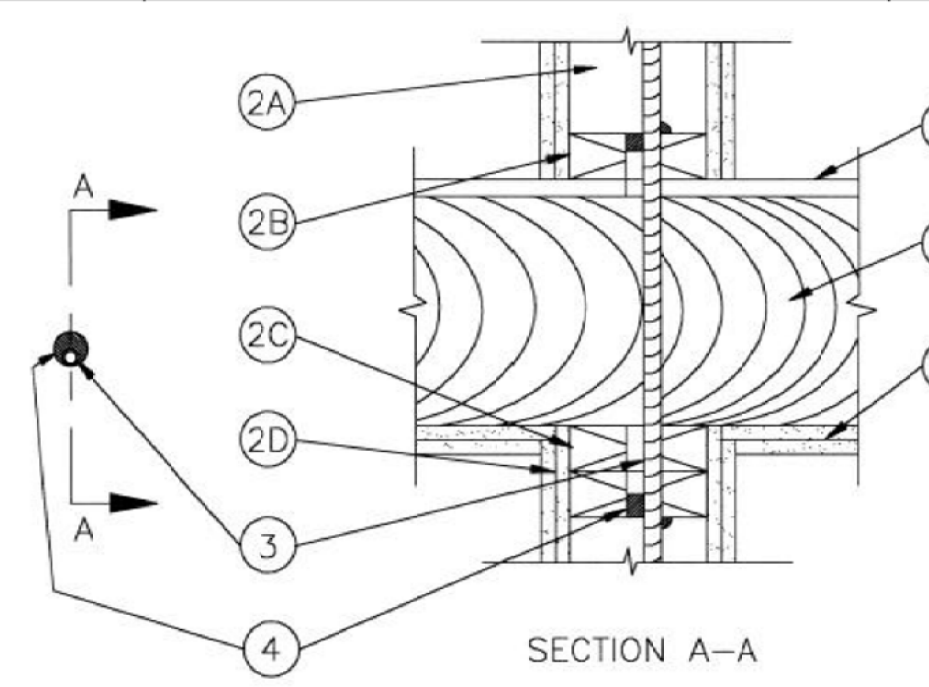
**F Rating - 1 Hr**  
**T Rating - 3/4 Hr**  
**F-C-2095**



- 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 as 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 is 5 in.
  - 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.
  - Wallboard, Gypsum\*** - Nom 4 ft wide by 5/8 in. thick as specified in the individual Floor-Ceiling Design. Wallboard nailed to wood joists.
- Chase Wall** - The through penetrants (Item 3) are routed through a 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:
  - Studs** - Nom 2 by 6 in. or double 2 by 4 in. lumber studs.
  - Sole Plate** - Nom 2 by 6 in. or parallel 2 by 4 in. lumber plates, tightly butted. Max diam of opening is 5 in.
  - Top Plate** - The double top plate shall consist of two 2 by 6 in. or two sets of parallel 2 by 4 in. lumber plates, tightly butted. Max diam of opening is 5 in.
  - Wallboard, Gypsum\*** - Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design.

Underwriters Laboratories Inc.® 1102 (1)

**F Rating - 2 Hr**  
**T Rating - 2 Hr**  
**F-C-3082**



- Floor-Ceiling Assembly** - The 2 hr fire-rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design Nos. L505, L511 or L536 in the UL Fire Resistance Directory, as 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 is 1-1/2 in.
  - Wood Joists\*** - Nom 10 in. deep (or deeper) lumber joists spaced 16 in. OC with bridging as required and with ends firestopped.
  - Gypsum Board\*** - Nom 4 ft wide by 5/8 in. thick as specified in the individual Floor-Ceiling Design. First layer of wallboard nailed to wood joists. Second layer of wallboard screw attached to furring channels.
  - The hourly F and T Ratings of the firstop system are equal to the hourly fire rating of the floor-ceiling assembly in which it is installed.**
- Chase Wall** - The through penetrants (Item 2) are routed through a 2 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:
  - Studs** - Nom 2 by 6 in. or double 2 by 4 in. lumber studs.
  - Sole Plate** - Nom 2 by 6 in. or parallel 2 by 4 in. lumber plates, tightly butted. Max diam of opening is 1-1/2 in.
  - Top Plate** - The double top plate shall consist of two 2 by 6 in. or two sets of parallel 2 by 4 in. lumber plates, tightly butted. Max diam of opening is 1-1/2 in.
  - Gypsum Board\*** - Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design.

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Continued ... **F-C-2093**

- Nonmetallic Penetrant** - One non-metallic pipe to be installed either concentrically or eccentrically within the firstop system. The annular space between penetrant and periphery of opening shall be min 0 in. (point contact) to max 3/4 in. Pipe to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
  - Polyvinyl Chloride (PVC) Pipe** - Nom 4 in. diam (or smaller) 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** - Nom 4 in. diam (or smaller) SDR17 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
  - Acrylonitrile Butadiene Styrene (ABS) Pipe** - Nom 4 in. diam (or smaller) Schedule 40 cellular or solid core ABS pipe for use in vented (drain, waste or vent) piping systems.
  - Rigid Nonmetallic Conduit\*\*** - Nom 4 in. diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA No. 70).
- Fill, Void or Cavity Material\* - Sealant** - Min 3/4 in. thickness of fill material applied within the annulus, flush with top surface of floor or top surface of sole plate. Min 1 in. thickness of fill material applied within the annulus, flush with bottom surface of lower top plate. Min 1/2 in. diam bead of fill material applied at the penetrant/plate interfaces at point contact locations on both sides of assembly.  
**Passive Fire Protection Partners\*\*** - 4800DW, 3600EX

+ Bearing the UL Listing Mark  
\* Bearing the UL Classification Marking  
\*\* Formerly Firestop Systems Inc.  
\*\*\* Not tested to 50 Pa Pressure Differential as required by Canadian Code Requirements for Combustible Drain, Waste or Vent piping System.

Underwriters Laboratories Inc.® 1102 (2)

Continued ... **F-C-2094**

- Nonmetallic Pipe** - One nonmetallic vent pipe provided with sanitary tee and branch drainpipe with or without p-trap to be installed either concentrically or eccentrically within the firstop system. The annular space between vent pipe and periphery of opening shall be min 1/8 in. to max 1/2 in. The annular space between branch drainpipe and periphery of opening in wallboard plate shall be min 1/4 in. to max 3/8 in. Pipe to be rigidly supported on both sides of floor assembly. The following types and sizes of nonmetallic pipes, fittings, tees and traps may be used:
  - Polyvinyl Chloride (PVC) Pipe** - Nom 2 in. diam (or smaller) Schedule 40 solid core or cellular core PVC pipe for use in vented (drain, waste or vent) piping system.
  - Chlorinated Polyvinyl Chloride (CPVC) Pipe** - Nom 2 in. diam (or smaller) SDR17 CPVC pipe for use in vented (drain, waste or vent) piping systems.
  - Acrylonitrile Butadiene Styrene (ABS) Pipe** - Nom 2 in. diam (or smaller) Schedule 40 cellular core or solid core ABS pipe for use in vented (drain, waste or vent) piping systems.
- Fill, Void or Cavity Material\* - Sealant** - Min 3/4 in. thickness of fill material applied within the annulus, flush with top surface of floor or top surface of sole plate. Min 1 in. thickness of fill material applied within the annulus, flush with bottom surface of lower top plate. Min 5/8 in. thickness of fill material applied around branch drainpipe, flush with top surface of wallboard.  
**Passive Fire Protection Partners\*\*** - 4800DW, 3600EX

\* Bearing the UL Classification Marking  
\*\* Formerly Firestop Systems Inc.  
\*\*\* Not tested to 50 Pa Pressure Differential as required by Canadian Code Requirements for Combustible Drain, Waste or Vent piping System.

Underwriters Laboratories Inc.® 1102 (2)

Continued ... **F-C-2095**

- Nonmetallic Pipe** - One nonmetallic vent pipe provided with sanitary tee and branch drainpipe with toilet flange to be installed either concentrically or eccentrically within the firstop system. The annular space between vent pipe and periphery of opening shall be min 1/8 in. to max 3/8 in. The annular space between branch drainpipe and periphery of opening shall be min 0 in. (point contact) to max 1/2 in. Pipe or conduit to be rigidly supported on both sides of floor assembly. The following types and sizes of nonmetallic pipes, fittings and flanges may be used:
  - Polyvinyl Chloride (PVC) Pipe** - Nom 4 in. diam (or smaller) Schedule 40 solid core or cellular core PVC pipe for use in vented (drain, waste or vent) piping system.
  - Chlorinated Polyvinyl Chloride (CPVC) Pipe** - Nom 4 in. diam (or smaller) SDR17 CPVC pipe for use in vented (drain, waste or vent) piping systems.
  - Acrylonitrile Butadiene Styrene (ABS) Pipe** - Nom 4 in. diam (or smaller) Schedule 40 solid core or cellular core ABS pipe for use in vented (drain, waste or vent) piping systems.
- Fill, Void or Cavity Material\* - Sealant** - Min 3/4 in. thickness of fill material applied within the annulus, flush with top surface of floor or top surface of sole plate. Min 1 in. thickness of fill material applied within the annulus, flush with bottom surface of lower top plate.  
**Passive Fire Protection Partners\*\*** - 4800DW, 3600EX
- Water Closet** - Floor mounted vitreous china water closet.

\* Bearing the UL Classification Marking  
\*\* Formerly Firestop Systems Inc.

Underwriters Laboratories Inc.® 1102 (2)

Continued ... **F-C-3082**

- Cables** - One cable to be installed either concentrically or eccentrically within the firstop system. The annular space between cable and periphery of opening shall be min 0 in. (point contact) to max 3/4 in. Cable to be rigidly supported on both sides of assembly. The following types of cables may be used:
  - Multiple fiber optical cable with polyvinyl chloride jacket and having a max 3/4 in. diam.
  - Type FT-1 coaxial cable with polyvinyl chloride jacket.
  - Max 3/0 No. 10 AWG (or smaller) copper conductor aluminum clad or steel clad TEK cable with XLPE insulation, with or without PVC jacket.
  - Max 2/0 with ground No. 14 AWG (or smaller) NM cables with polyvinyl chloride insulation and with PVC jacket.
- Through Penetrating Product\*** - Max four copper conductor No. 2/0 AWG (or smaller) aluminum or steel **Metal Clad Cable\*** or max four copper conductor No. 1 AWG (or smaller) aluminum **Armored Cable\*** or max 750 kcmil (or smaller) aluminum or copper Type THHN or XHHW conductors, jacketed of unjacketed aluminum or steel **Metal Clad Cable\***  
**SOUTHWIRE CO** - Type MC, Type AC
- Fill, Void or Cavity Material\* - Sealant** - Min 3/4 in. thickness of fill material applied within the annulus, flush with top surface of floor or top surface of sole plate. Min 1 in. thickness of fill material applied within the annulus, flush with bottom surface of lower top plate. Min 1/2 in. diam bead of fill material applied at the cable/plate interfaces at point contact locations on both sides of assembly.  
**Passive Fire Protection Partners** - 3600EX, 4800DW

\* Bearing the UL Classification Marking

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State of Washington

N B Partners, LLC

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11060 16th Ave. S.W.  
Seattle, WA 98146

REVISIONS  
1 JULY 16, 2007  
DDES COMMENTS  
2 JAN. 14, 2008  
DDES COMMENTS

DATE: FEB. 27, 2007  
PHASE: PERMIT SUBMITTAL

DESCRIPTION:  
RATED PENETRATION DETAILS

A9.1