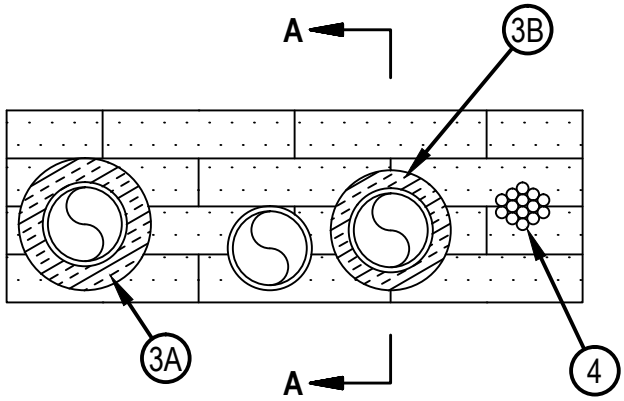
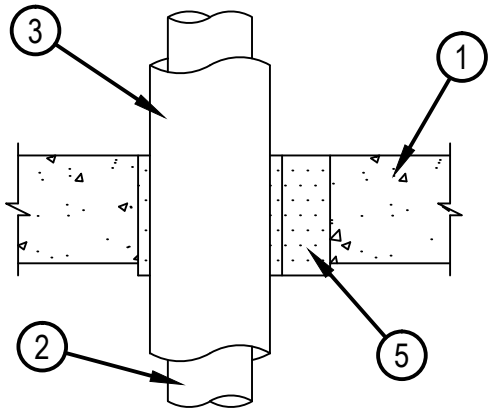
Classified by
Underwriters Laboratories, Inc.
to UL 1479 and CAN/ULC-S115

System No. C-AJ-8100

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 3 Hr	F Rating — 3 Hr
T Ratings — 0, 3/4 and 1 Hr (See Item 2)	FT Ratings — 0, 3/4 and 1 Hr (See Item 2)
	FH Rating — 3 Hr
	FTH Ratings — 0, 3/4 and 1 Hr (See Item 2)





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/m3) concrete floor or min 5 in. (127 mm) reinforced lightweight or normal weight concrete wall. Wall may also be constructed of any UL Classified Concrete Blocks*. Max area of opening is 192 in2 (1239 mm2) with max dimension of 24 in. (610 mm).

   See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Through-Penetrant — One or more pipes or tubes to be installed within the opening. The total number of through-penetrants is dependent on the size of the opening and types and sizes of the penetrants. Any combination of the penetrants described below may be used provided that the following parameters relative to the annular spaces and the spacings between the pipes are maintained. The separation between cable bundle, tubes and insulated tubes shall be min 1/2 in. (13 mm) to max 3-1/8 in. (79 mm). The annular space between penetrants and the periphery of opening shall be min 1/2 in. (13 mm) to max 5 in. (127 mm). Pipes or tubes to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes or tubes may be used.

   A. Copper Tubing — Nom 3 in. (76 mm) diam (or smaller) Type L (or heavier) copper tube.

   B. Copper Pipe — Nom 3 in. (76 mm) diam (or smaller) Regular (or heavier) copper pipe.

   The hourly T, FT and FTH Ratings are 1 hr when a copper tube with fiber-glass insulation is used, 0 hr when a bare copper tube and a cable bundle are used and 3/4 hr when a copper tube with AB/PVC tube insulation is used.

3. Pipe Insulation — (Optional)—The floowing types of pipe insulation may be used:

   A. Pipe Covering* — Nom 1 in. (25 mm) thick (or thinner) hollow cylindrical heavy density (min 3.5 pcf) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product.

   See Pipe and Equipment Covering —Materials (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classifica tion Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

   B. Tube Insulation-Plastics+++ — Nom 3/4 in. (19 mm) thick (or thinner) acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the foarm of tubing.

   See Plastics+++—(QMFZ2) category in the Plastics Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be used.

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4. Cables — Max 2 in. (51 mm) diam tight bundle of cables installed within the opening and rigidly supported on both sides of floor or wall assembly. The space between the cables and periphery of the opening shall range from min 2 in. to max 4 in. (51 to 102 mm). Any combination of the following types and sizes of metallic conductor of fiber optic cable may be used:
   A. Max 500 kcmil single copper connector power cable with thermoplastic insulation and polyvinyl chloride (PVC) jacket.
   B. Max 300 pair No. 24 AWG copper conductor telecommunication cables with PVC insulation and jacket material.
   C. Max 7/C copper conductor No. 12 AWG multiconductor power and control cables with PVC or cross-linked polyethylene (XLPE) insulation and PVC jacket.
   D. Multiple fiber optical communication cables jacketed with PVC and having a max outside diam of 1/2 in. (13 mm).
   E. Max 3/C copper conductor No. 12 AWG with bare aluminum ground, PVC insulated steel Metal-Clad cable.
5. Firestop System — The firestop system shall consist of the following:
   A. Fill Void or Cavity Materials*-Fire Blocks — Fire blocks installed with 5 in. (127 mm) dimension projecting through opening, flush with top surface of floor assembly or centered within wall assembly. In concrete block walls, fire block to fill entire thickness of wall opening unless wall is solid filled. Blocks to be firmly packed and completely fill the entire area of opening. Either one or a combination of the block types specified below may be used.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS657 Fire Block or CFS-BL Firestop Block
   B. Fill Void or Cavity Materials* — Fill material applied to any voids that may exist around penetrants and fire blocks.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant, FS-ONE MAX Intumescent Sealant or CP618 Firestop Putty Stick

+++Bearing the UL Recognized Component Marking

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