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, V300, U400, V400 or W400 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. 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 in all four sides.

B. **Gypsum Board** - 5/8 in. (16 mm) thick, 4 ft (1.2 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 19-1/2 in. (495 mm) for steel stud walls. Max diam of opening is 14-1/2 in. (368 mm) for wood stud walls.

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 Penetrant** - One nonmetallic pipe to be installed within the opening. Pipe to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipe may be used:

A. **Polypropylene (PP-R) Pipe** - Nom 12 in. diam - 315 mm OD (or smaller) SDR 11 Aquatherm Blue Pipe MF for use in closed (process or supply) piping systems.

B. **Polypropylene (PP-R) Pipe** - Nom 12 in. diam - 315 mm OD (or smaller) SDR 11 Aquatherm Green Pipe S for use in closed (process or supply) piping systems.

3. **Pipe Covering Materials** - **Cellular Glass Insulation** - Nom 2 in. (51 mm) thick cellular glass units sized to the outside diam of the through-penetrant and supplied in nom 24 in. (610 mm) long half sections or nom 18 in. (457 mm) long segments. Pipe insulation installed on pipe in accordance with the manufacturer's instructions. Transverse joints located within 36 in. (914 mm) of wall surfaces secured using min 1/2 in. (13 mm) wide by 0.028 in. (0.7 mm) thick stainless steel hose clamps offset 1 in. (25 mm) from joint on each side of joint. A nom annular space of 1-9/16 in. (40 mm) is required within the firestop system.
4. **Firestop System** - The firestop system shall consist of the following:

A. **Steel Sleeve** - Cylindrical sleeve fabricated from min 0.016 in. (0.4 mm) thick (30 gauge) galv sheet steel and having a 2 in. (51 mm) lap along the longitudinal seam. Length of steel sleeve to be 4 in. (102 mm) greater than the thickness of the wall. Sleeve installed by coiling the sheet steel to a diam smaller than the through opening, inserting the coil through the openings and releasing the coil to let it uncoil against the circular cutouts in the wallboard layers. The ends of the sleeve shall extend 2 in. (51 mm) beyond each surface of the wall.

B. **Fill, Void or Cavity Material - Sealant or Putty** - (Not Shown) Min 3/8 in. (10 mm) diam bead of fill material applied around circumference of steel sleeve at its egress from the wallboard layers on each side of the wall.

**SPECIFIED TECHNOLOGIES INC** - SpecSeal Series SSS Sealant, SpecSeal LCI Sealant or SpecSeal Putty

C. **Fill, Void or Cavity Materials* - Wrap Strip** - Nom 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. Two stacks (4 in. (102 mm) stack height) of wrap strips are individually or continuously wrapped around the through penetrant. Each stack shall consist of seven layers of wrap strip. When wrap strips are individually wrapped, ends of wrap strips shall be butted and held in place with tape. Butted ends in successive layers may be aligned or offset. The first stack of wrap strips shall be slid along the through penetrant into the sleeve such that the outside edges of the wrap strip layers are flush with the end of the sleeve. The second stack of wrap strips shall be installed such that the edges of the wrap strip layers abut the first stack. Two stacks of wrap strips are required on each side of the wall.

**SPECIFIED TECHNOLOGIES INC** - SpecSeal BLU Wrap Strip

D. **Steel Collar** - Collar fabricated from coils of precut 0.029 in. (0.7 mm) thick (No. 22 MSG) galv sheet steel available from wrap strip manufacturer. Collar shall be nom 4 in. (102 mm) deep with a min of six 1 in. (25 mm) wide by 2 in. (51 mm) long anchor tabs for securement to the wall. Retainer tabs, 3/4 in. (19 mm) wide tapering down to 3/8 in. (10 mm) wide and located opposite the anchor tabs, are folded 90 degrees toward through penetrant surface to maintain the annular space around wrap strips and through penetrant and to retain the wrap strips. Two steel collars wrapped around wrap strips and through penetrant with a min 1 in. (25 mm) wide overlap at the end of each collar along its perimeter joint with the adjacent steel collar. Steel collars tightened around wrap strips and through penetrant using min 1/2 in. (13 mm) wide by 0.028 in. (0.7 mm) thick stainless steel hose clamps located 1 in. (25 mm) and 3 in. (76 mm) from wall surface. Collars to be secured to wall surfaces with 1/8 in. (3.2 mm) diam by min 2-3/4 in. (70 mm) long steel moly bolts or toggle bolts in conjunction with min 1-1/4 in. (32 mm) diam steel fender washers through each of a min of twelve symmetrically-located anchor tabs. As an alternate to hollow wall anchors, steel collars secured to steel sleeve with twelve No. 8 by 3/8 in. (10 mm) long sheet metal screws, symmetrically located around the perimeter of the steel collar. Steel collars installed on both sides of the wall assembly.

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