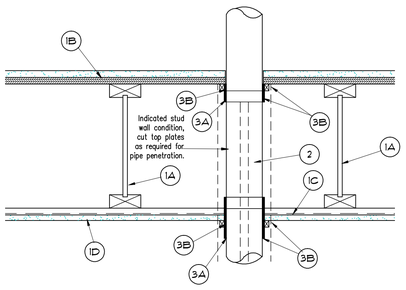


System No. FC 2009
(Formerly System No. 451)
F Rating– 1 Hr T Rating– 0 and 1 Hr (see Item 3)

A Pipe Penetration @ Ceil./Floor

(STUD WALLS SIMILAR)

1. Floor Assembly. The fire rated wood truss or combination wood and steel truss Floor–Ceiling assembly shall be constructed of the materals and in the manner described in the individual L500 Series Design in the UL Fire Resistance Directory and shall include the following con–struction features:
   A. Trusses–Min 12 in. deep parallel chord trusses fabricated from nom 2 by 4 in. lumber in conjunction with galv steel truss plates or Structural Wood Members* with bridging as required.
   B. Flooring–Nom 3/4 in. thick plywood flooring with or without Floor Topping Mixture*. Diam of hole–sawed opening in flooring to be max 1/2 in. larger than diam of pipe. Max diam of opening in flooring 5 in.
   C. Furring Channels–Rigid or resilient galv steel furring channels installed perpendicular to bottom chord of trusses.
   D. Wallboard, Gypsum*–Nom 4 ft. wide by 5/8" in. thick, screw–atached to furring channels. Diam of hole–sawed opening in gypsum wallboard ceiling to be max 1/2 in larger than diam of pipe. Max diam of opening in ceiling is 5 in. Secondary firestop system (Item 3) must be installed at underside of flooring prior to installation of the gypsum wallboard ceiling.
2. Nonmetallic Pipe–Nom 4 in. diam (or smaller) Schedule 40 polyvinyl chloride (PVC), SDR 17 chorinated polyvinyl chloride (CPVC) or solid–core Schedule 40 acrylonitrile–butadiene–styrene (ABS) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping sys–tems. One pipe to be installed approx midway between trusses and centered in circular open–ings in flooring and ceiling. Pipe to be rigidly supported on both sides of Floor–Ceiling assembly.
3. Firestop System– The hourly T rating for the firestop system is dependent upon the type and size of nonmetallic pipe, as tabulated below:

Pipe Type	Nom Pipe Diam, in.	Annular Space, in.	T Rating Hr.
ABS, PVC or CPVC	1/2 to 2	0 to 1/8	1
ABS	2 1/2 to 4	0 to 1/4	0
PVC, or CPVC	2 1/2 to 4	0 to 1/4	1

The details of the firestop system shall be as follows:

A. Fill, Void or Cavity Materials*– Wrap Strip–Nom 1/4 in. thick intumescent elastomeric material faced on one side with alumium foil, supplied in 2 in. wide strips. Nom 2 in. wide strip tightly–wrapped around nonmetallic pipe (foil side exposed) with the edges butted against the underside of the plywood flooring and against the bottom surface of the gypsum wallboard ceiling around the entire perimeter of the hole–sawed openings. Sufficient layers of wrap strip shall be installed to lap a min. of 3/16" or on the plywood flooring and on the gypsum wallboard ceiling around the entire perimeter of the hole–sawed opening. For nom. 1/2 in. to nom 2 in. diam pipes, a min of one layer of wrap strip is required. For nom 2–1/2 in. and nom 3 in. diam pipes, a min. of two layers of wrap strip is required. For nom 3–1/2 in. and nom 4 in. diam pipes, a min of three layers of wrap strip is required. Each layer of wrap strip to be installed with butted seam, with butted seams in successive layers staggered. Wrap strip layer(s) temporarily held in position using aluminum foil tape, steel wire tie, or equivalent.

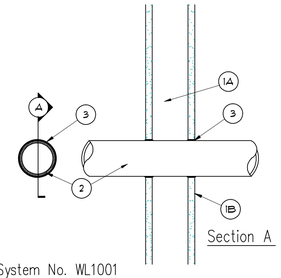
Minnesota Mining & Mfg. Co.– Type FS–195

B. Steel Collar–Nom 2 in. deep collar with 1–1/4 in. wide by 2 in. long anchor tabs and min 3/4 in. long tabs to retain wrap strips layers. Coils of precut 0.016 in thick (30m gauge) galv sheet steel are available from wrap strip manufacturer. As an alternate, collar may be field fabricated from min. 0.016 in thick (30 gauge) sheet steel in accordance with instruction sheet applied by wrap strip manufacturer. Steel colar, with anchor tabs bend outward 90 deg, wrapped thigtly around wrap strip layers with min 1 in. overlap at the seam. With steel anchor tabs pressed tightly against underside of plywood flooring or under–side of gypsum wallboard ceiling, compres collar around wrap strips layer ssuing a min 1/2" wide by 0.028 in. thick stainless steel band clamp with worm drive tightening mechanism at the collar midheight. Secure collar to plywood flooring using min. 3/4 in. long steel screws on conjuction with 1–1/4 in. diam. steel fender washers. Secure collar to gypsum wallboard ceiling using 3/16 in. diam steel toggle bolts (5/8 in. grip) in con–junction with 1–1/4 in. diam. steel fender washers. min of three fasteners, symmetrically located, required for nom 1/2 i. to nom 3 in. diam pipes. Min of four symmetrically located fasteners required for nom 3–1/2 in. and 4 in. diam pipes. As a final step, bend wrap strip retaier tabs 90 mdeg toward pipe to lock wrap strip layers in position.

C. Fill, Void or Cavity Materials*– Caulk or Putty–Generous application of caulk or putty to be applied around the perimeter of the steel collar at its interface with the plywood flooring and gypsum wallboard ceiling. A generous application of caulk or putty shall be applied around the perimeter of the pipe at its interface with the wrap strip layers.
Minnesota Mining & Mfg. Co.–Type CP–25 W/B, CP–25 WB+ Caulk, Type MP Putty

D. Firestop Device*–(Not Shown)–As an alternate to items A, B and C for nom 1–1/2, 2, 3 or 4 in. diam nonmetallic pipes, a firestop device consisting of a sheet–steel split collar lined with intumescent material and provided with steel clips for attachment may be used. Firestop device to be installed on underside of plywood flooring or underside of gypsum wallboard ceiling around in accordance with the accompanying installation instructions.
Minnesota Mining & Mfg. Co.–Type PPD 150, PPD 200, PPD 300, PPD 400.

*Bearing the UL Classification Marking.ed



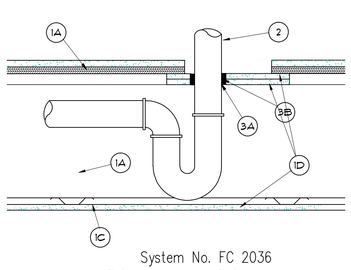
System No. WL1001
(Formerly System No. 147)
F Ratings– 1, 2, 3, and 4 Hr (See Items 2 and 3)
T Ratings–0, 1, 2, 3, and 4 Hr. (See Item 3)

B Pipe Penetration @ Wall

1. Wall Assedmbly–The 1, 2, 3, or 4 hr. fire–rated gypsum wallboard/ stud wall assembly shall be constructed of the materials and in the manner described in the individual U300 or U400 Series Wall or 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 (max. 2 hr. fire rated assemblies) or steel channel studs. Wood studs to consist of nom 2 by 4 lumber spaced 16 in. O.C. with nom 2 by 4 in. lumber and end plates and cross braces. Steel studs to be min. 3–5/8" in. wide by 1–3/8 in. deep channels spaced max 24 in. O.C.
   B. Wallboard, Gypsum*–Nom 1/2 or 5/8 in. thick, 4 ft. wide with square or tapered edges. The gypsum wallboard type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max. diam of opening is 13–1/2 in.
2. Pipe or Conduit–Nom 12 in. diam (or smaller) Schedule 10 (or heavier) steel pipe, nom 6 in. diam (or smaller) steel conduit, nom 4 in. diam (or smaller) steel electrical metallic tubing or Type L (or heavier) copper tubing or nom. 1 in. diam (or smaller) flexible steel conduit. When copper pipe or flexible steel conduit is used, max F Rating of firestop system (Item 3) is 2 hr. Steel pipes or conduits larger than nom 4 in. diam may only be used in walls constructted using steel channel studs. A max of one pipe or conduit is permitted in the firestop system. Pipe or conduit to be installed near center of stud cavity width and to be rigidly sup–ported on both sides of wall assembly.
3. Fill, Void, or Cavity Material*–Caulk–Caulk fill material installed to completely fill annular space between pipe or conduit and gypsum wallboard and with a min 1/4 in. diam bead of caulk applied to perimeter of pipe or conduit at its egress from the wall. Caulk installed symmetrically on both sides of wall assembly. the hourly F Rating of the firestop system is dependent upon the hourly fire rating of the wall assembly in which it is installed, as shown in the following table. The hourly T Rating of the firestop syhstem is dependent upon the type or size of the pipe or conduit and the hourly fire rating of the wall assembly in which it is installed as tabulated below:

Max Pipe or Conduit Diam, in	Annular Space, in	F Rating, Hr.	T Rating, Hr.
	0 to 3/16	1 or 2	0+, 1 or 2
1	1/4 to 1/2	3 or 4	3 or 4
1	0 to 1/4	1 or 2	0
4	1/4 to 1/2	3 or 4	0
6	3/16 to 3/8	1 or 2	0
12			

+ When copper pipe is used, T Rating is 0 hr.
Minnesota Mining & Mfg. Co.–Types CP–25 S/L CP–25 N/S, CP–25 WB, CP–25 WB+
*Bearing the UL Classification Marking

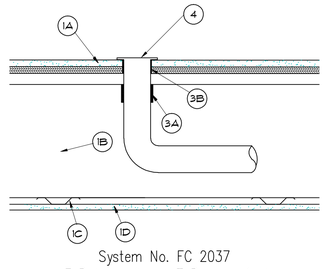


System No. FC 2036
F Rating– 1 Hr T Rating– 1 Hr

C Floor Penetration @ Tub

1. Floor –Ceiling Assembly––The fire–rated solid or trussed lumber joist floor–ceiling assembly shall be constructed of the mateials and in the manner specified in individual L500 Series Floor–Ceiling Designs in the UL Fire Resistance Directory. The general construction details of the floor–ceiling assembly are summaried below:
   A. Floor 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 accommodate the bathtub drain piping (Item 2) to be max 8 by 12 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. A an alternate to lumber and steel joists, trusses or Structural AWood Members* with bridging as required with ends firestopped.
   C. Furring Channels––Resilient galv steel furring installed perpendicular to wood joist (Item 1B) between wallboard (Item 10) and wood joists as required in the individual Floor–Ceiling Design.
   D. Wallboard GYpsum*––Nom 4 ft wide by 5/8 in. thick as specified in the individual Floor–Ceiling Design. Wallboard secured to wood joists as specified in the individual Floor–Ceiling Design. Two pieces of gypsum wallboard, each min 4 in. longer and wider than the cutout in the flooring, screw–attached to bottom of flooring concentric with cutout. Diam of opening hole–sawed through both layers of the gypsum wallboard patch to be 1/2 to 5/8 in. larger than outside diam of bathtub drain piping (Item 2).
2. Drain Piping––Nom 1–1/2 in. diam. Schedule 40 polyvinyl chloride (PVC) or acrylonitrile butodiene styreen (ABS) pipes and drain fittings cemented together and provided with PVC or ABC bathtub waste/overflow fittings, respectively.
3. Firestop System––The firerstop system shall consist of the following:
   A. Fill, Void or Cavity Materials*––Wrap Strip––Nom 1/4" thick intumescent material faced on both sides with a plastic film, supplied in 1–1/2 in. Nom 1–1/2 in. wide aluminum foil tape and slid into hole–sawed opening in gypsum wallboard path (Item 1D). Top edge of wrap strip to extend a nom 1/2 in. below above top surface of gypsum wallboard patch.
   Specified Technologies Inc.––SpecSeal RED Strip
   B. Fill, Void or Cavity Mateials*––Sealant––Nom 1/4 in. thickness of fill material to be applied to perimeter of wrap strip at it's egress from the underside of the gypsum wallboard patch. Nom 1/4 in. thickness of fill all gaps between the wrap strip layer andthe tee of the drain fitting on the top surface of the gypsum wallboard patch.
   Specified Technologies Inc.––SpecSeal 100, 101 or 105 Sealant

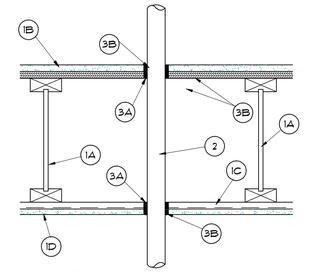
*Bearing the UL Classification Marking



System No. FC 2037
F Rating– 1 Hr T Rating– 1 Hr

D Floor @ Water Closet

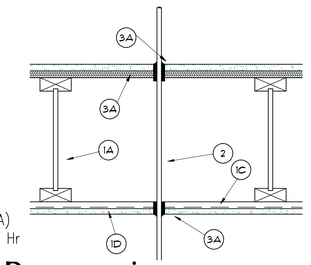
1. Floor––Ceiling Assembly––The fire rated solid or trussed lumber joist floor –ceiling assembly shall be constructed of the materials and in the manner specified in individual L500 Series Floor–Ceiling Designs in the UL Fire Resistance Directory. The general construction details of the floor–ceiling 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 is 5 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. As an alternate to lumber, joists, nom 10 in. deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required with end firestopped.
   C. Furring Channels––Resilient galv steel furring installed perpendicular to wood joists (Item 1B) between wallboard (Item 1D) and wood joists as required in the individual Floor–Ceiling Design.
   D. Wallboared Gypsum*––Nom 4 ft wid by 5/8 in. thick as specified in the individual Floor–Ceiling Design. Wallboard secured to wood joists as specified in the individual Floor–Ceiling Design.
2. Drain Piping––Nom 4 in. diam (or similar) Schedule 40 polyvinyl chloride (PVC) or acrylonitrla butodiene styrene (ABS) drain piping and fittings. Diam of circular opening hole through flooring (Item A) to be max 1/2 in. larger than outside diam of pipe. Short length pipe with 90 degree elbow fitting cemented into bottom socket of closet flange (Item 5). Drain piping cemented to elbow.
3. Firestop System––The firestop system shall consist of the following:
   A. Fill, Void or Cavity Material*––Wrap Strip––Nom 1/4 in. thick intumescent material faced on both sides with plastic film, supplied in 1–1/2 in wide strips. Nom 1–1/2 in. wide stripe tightly–wrapped around nometallic pipe with the edges butted against the underside of flooring around the entire perimeter of the hole sawed opening. Two layers of wrap strip or required. Each layer of wrap strip to be installed with butted seams, butted seams in successive layers staggered or aligned. Wrap strip layer(s) temporarily held in position using aluminum foil tape.
   Specified Technologies INc.––SpecSeal RED Strip
   B. Steel Collar––Collar fabricated from coils of precut 0.016 in thick (30 MSG) galv sheet steel available from wrap strip man–ufacturer. Collar shall be nom 1–1/2 in. deep with min four 1 in. wide by 2 in. long anchor tabs for securement to top surface of flooring. Retainer tabs, 3/4 in. wide tapering down to 1/4 in. wide and located opposite the anchor tabs, are folded 90 degrees toward through–penetrate surface to maintain the annular space and to retain the wrap strips. Steel collar wrapped around wrap strips and through–penetrate with a 1 in. wide overlap along its perimeter joint and secured together by means of min 1/2 in. wide by 0.028 in. thickness stainless steel hose clamp at mid–height of the steel collar. A an alternate to the steel hose clamp, the steel collar can be secured together by means of three No. 8 by 3/8 in. long steel sheet metal screws. Anchor tabs of collar bent outwards and secured to top surface of flooring or underside of floor using min 3/4 in. long steel wood screws in conjunction with 1/4 in. by 1–1/4 in. diam steel fender waashers.
4. Closet Flange––PVC or ABS closet stub sized to accommodate drain pipe. Closet flange installed in hole–sawed opening in flooring system with flange secured to top of flooring wth steel screws.
5. Water Closet––(Not Shown)––Floor mounted vitreous china.



System No. FC 2008
(Formerly System No. 451)
F Rating– 1 Hr T Rating–1 Hr

E Pipe Penetration @ Ceiling/Floor

1. Floor Assembly. The fire rated wood truss or combination wood and steel truss Floor–Ceiling assembly shall be constructed of the materals and in the manner described in the individual L500 Series Design in the UL Fire Resistance Directory and shall include the following con–struction features:
   A. Trusses–Min 12 in. deep parallel chord trusses fabricated from nom 2 by 4 in. lumber in conjunction with galv steel truss plates or Structural Wood Members* with bridging as required.
   B. Flooring–Nom 3/4 in. thick plywood flooring with or without Floor Topping Mixture*. Diam of hole–sawed opening in flooring to be max 1/2 in. to 3/4 in. larger than diam of pipe. Max diam of opening in flooring 3 in.
   C. Furring Channels–Rigid or resilient galv steel furring channels installed perpendicular to bottom chord of trusses.
   D. Wallboard, Gypsum*–Nom 4 ft. wide by 5/8" in. thick, screw–atached to furring channels. Diam of hole–sawed opening in gypsum wallboard ceiling to be 1/2 in. to 3/4 in. larger than diam of pipe. Max diam of opening in ceiling is 3 in.
2. Nonmetallic Pipe–Nom 4 in. diam (or smaller) Schedule 40 polyvinyl chloride (PVC), SDR 17 chorinated polyvinyl chloride (CPVC) or solid–core Schedule 40 acrylonitrile–butadiene–styrene (ABS) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping sys–tems. One pipe to be installed approx midway between trusses and centered in circular open–ings in flooring and ceiling. A nom 1/4 in. to 3/8 in. annular space is required in the fire–stop system. Pipe to be rigidly suypported on both sides of Floor–Ceiling assembly.
3. Firestop System––The details of the firestop system shall be as follows:
   A. Fill, Void or Cavity Materials*– Wrap Strip–Nom 1/4 in. thick intumescent elastomeric material faced on one side with alumium foil, supplied in 2 in. wide strips. Nom 2 in. wide strip tightly–wrapped around nonmetallic pipe (foil side exposed), secured with two steel tie wires and slid into hole–sawed opening in flooring (Item 1B) and in gypsum wall–board ceiling (Item 1D). Bottom edge of wrap strip to project 9/16 to 11/16 in. below bottom surface of flooring and below bottom (ceiling) surface of gypsum wallboard.
   Minnesota Mining & Mfg. Co.– Type FS–195
   B. Fill, Void or Cavity Materials*– Caulk or Putty–nom 1/4 in. thickness of caulk or putty to be applied to the exposed edges of the wrap strip layer (top of flooring and bottom of gypsum wallboard ceiling). Generous application of caulk or putty to be applied to fill all gaps at the wrapstrip/flooring and wrap strip/gypsum wallboard ceiling interfaces.
   Minnesota Mining & Mfg. Co.–Type CP–25 W/B, CP–25 WB+ Caulk, Type MP Putty



System No. FC 3007
(Formerly System No. 452–A)
F Rating– 1 Hr T Rating–1 Hr

F Cable Penetration @ Ceiling/Floor

1. Floor Assembly. The fire rated wood truss or combination wood and steel truss Floor–Ceiling assembly shall be constructed of the materals and in the manner described in the individual L500 Series Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. Trusses–Min 12 in. deep parallel chord trusses fabricated from nom 2 by 4 in. lumber in conjunction with galv steel truss plates or Structural Wood Members* with bridging as required.
   B. Flooring–Nom 3/4 in. thick plywood flooring with or without Floor Topping Mixture*. Diam of hole–sawed opening in flooring to be 1 in.
   C. Furring Channels–Rigid or resilient galv steel furring channels installed perpendicular to bottom chord of trusses.
   D. Wallboard, Gypsum*–Nom 4 ft. wide by 5/8" in. thick, screw–atached to furring channels. Diam of hole–sawed opening in gypsum wallboard ceiling to be 1 in.
2. Cables––Max seven conductor No. 12 AWG (or smaller) power/control cables or max 100 pair No 22 AWG (or smaller) telecommunication cables with polyvinyl choloride insulation and jacket materials. Individual cables to be centeed in nom 1 in. diam. circular cutouts. Cables to be rigidly supported on both sides of Floor–Ceiling assembly.
3. Fill, Void or Cavity Materials*– Caulk or Putty–Caulk or putty fill material forced into annular space throughout thickness of flooring and gypsum wallboard ceiling and with a min. 1/4 in. bead applied to perimeter of cable at its egress from the top of the flooring and the underside of the gypsum wallboard ceiling.
   Minnesota Mining & Mfg. Co.–Type CP–25 WB, CP–25 WB Caulk, Type MP Putty
   *Bearing the UL Classification Marking.ed

date: 1-5-2010
project no. 100936
drawn by: DDB
checked by:
revisions:

drawing title: FIRE PENETRATION DETAILS

The design and details disclosed herein are the exclusive property of BIEBERLY ARCHITECTS, PA and shall not be modified, reproduced or published in any way, in part or whole, without prior written consent of BIEBERLY ARCHITECTS, PA.

Comfort INN & SUITES

70 ROOM MOTEL
COMFORT INN & SUITES
Parachute, Colorado
OWNER: Jay Koshiya

BIEBERLY ARCHITECTS
227 north santa fe, suite 302
post office box 1731
salina, kansas 67402–1731
phone: 785–823–9221
fax: 785–823–9234
dave@bieberlyarchitects.net

BID SET 1-5-10

sheet no. A406 of .