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BENFIELD APARTMENTS

111 E. Main St.
Gibsonville, NC 27249

DRAWING NAME
PENETRATION DETAILS



DRAWN	HLD
CHECKED	JNK
DATE	11/29/23
SCALE	AS NOTED
JOB NO.	23052
SHEET	

E-3

System No. W-L-3414
ANSI/UL1479 (ASTM E814)

F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 0, 1/2, 1 and 2 Hr (See Item 2)
L Rating at Ambient - Less than 1 CFM/Opening
L Rating at 400 F - Less than 1 CFM/Opening

SECTION A-A

1. **Wall Assembly** - The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, U400 or W400 Series Wall and 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 or steel channel studs. Wood studs to consist of nom 2 in. (51 mm) by 4 in. (102 mm) lumber spaced 16 in. (405 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.

B. **Gypsum Board** - 5/8 in. (16 mm) thick, 4 ft (1219 mm) 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 Wall and Partition Design. Opening may be round, rectangular or irregular with a max diam or dimension of 1 in. (25 mm).

The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.

2. **Cables** - Single or tight bundle of cables to be installed within the opening. Aggregate cross-sectional area of cables in opening to have a visual fill of min 65% to max 100%. The annular space between the cable bundle and the periphery of the opening to be min 0 in. (point contact). Cables to be rigidly supported on both sides of the wall assembly. Any combination of the following types and sizes of cables may be used:

A. Max 3/C No. 8 AWG NM copper conductor cable (Romex) with PVC insulation and jacket.

B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE insulation and jacket.

C. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with PVC or plenum rated insulation and jacketing.

D. Max 4 pr No. 22 AWG (or smaller) Cat 5 or Cat 6 computer cables with PVC or plenum rated insulation and jacketing.

E. Type RG/U coaxial cable with fluorinated ethylene or PVC insulation and jacketing having a max outside diameter of 1/2 in. (13 mm).

F. Max 24 fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation.

G. Through Penetrating Product* - Max two copper conductor No. 18 AWG (or smaller) Power or Non-Power Limited Fire Alarm Cable with or without a metal armor.

H. Maximum 3/C No. 10 AWG copper conductor metal-clad cable.

The hourly T, FT and FTH Ratings of the firestop system are dependent on cable type and hourly wall rating as specified in Table below.

Cable Type	Hourly Wall Rating	Hourly T, FT and FTH Rating
None (Blank Opening)	1 and 2	1 and 2
A	1 and 2	1 and 2
B	1	0
C	2	1/2
D	1 and 2	1 and 2
E	1 and 2	1 and 2
F	1 and 2	1 and 2
G	1 and 2	1 and 2
H	1 and 2	1 and 2

3. **Fill, Void or Cavity Material** - Nom 60 mm diam by 3 mm thick putty disc with one seam at radius. Paper-bocker of disc to be removed and disc firmly pressed around the cable/cable bundle lapping nom 5 mm onto cables to completely cover opening and firmly pressed to lap onto the wall around periphery of opening. Disc seam to be firmly pressed and sealed tight. Disc to be installed at both surfaces of wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - CFS-D 1" Firestop Cable Disc

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

SYSTEM NO. W-L-3414
PENETRATION DETAIL
SCALE: N.T.S.

SEE NOTE 22

System No. F-C-3012
ANSI/UL1479 (ASTM E814)

F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 0, 1 and 1-3/4 Hr (See Item 3)

SECTION A-A

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:

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 for 1 or 2 hr assembly is 2-1/2 in. (64 mm) or 2 in. (51 mm), respectively.

B. **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 firestopped.

C. **Furring Channels** - (Not Shown) - Resilient galvanized steel furring installed in accordance with the manner specified in the individual L500 Series Designs in the Fire Resistance Directory.

D. **Gypsum Board** - Thickness, type, number of layers and fasteners shall be as specified in the individual Floor-Ceiling Design. Max diam of opening for 1 or 2 hr assembly is 2-1/2 in. (64 mm) or 2 in. (51 mm), respectively.

The F Rating of the firestop system is equal to the rating of the floor-ceiling assembly.

2. **Chase Wall** - (Optional) - The through penetrant (Item 3) shall be routed through a 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:

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

B. **Sole Plate** - Nom 2 by 6 in. (51 by 152 mm) or parallel 2 by 4 in. (51 by 102 mm) lumber plates, tightly butted. Max diam of opening for 1 or 2 hr rated assembly is 2-1/2 in. (64 mm) or 2 in. (51 mm), respectively.

C. **Top Plate** - The double top plate shall consist of two nom 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. Max diam of opening for 1 or 2 hr rated assembly is 2-1/2 in. (64 mm) or 2 in. (51 mm), respectively.

D. **Gypsum Board** - Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design.

3. **Cables** - In 1 hr fire-rated assemblies, aggregate cross-sectional area of cables in opening to be max 45 percent of the cross-sectional area of the opening (max 2 in. (51 mm) diam bundle). Cables to be rigidly supported on both sides of floor assembly. Any combination of the following types and sizes of copper conductors may be used:

A. Max 59 coaxial cable with single copper conductor, cellular polyethylene cellular foam insulation and polyvinyl chloride (PVC) jacket.

B. Max 8/C No. 22 AWG telephone cable with polyvinyl chloride (PVC) jacketing.

C. Max 2/C No. 12 AWG cable with polyvinyl chloride (PVC) insulation and jacketing.

D. Max 3/C with ground No. 2/0 AWG aluminum or copper Type SER cable with polyvinyl chloride (PVC) insulation.

E. Max 3/C with ground No. 2/0 AWG Type NM cable with polyvinyl chloride (PVC) insulation.

F. Max 3/C No. 12 AWG MC (BX) cable with polyvinyl chloride (PVC) insulation.

G. Max 1 in. diam metal clad TEK cable with PVC jacket.

H. Max 4/C with ground No. 300 kcmil (or smaller) aluminum SER cable with PVC insulation and jacket.

I. Through Penetrating Product* - Any cables, Metal-Clad Cable+ or Armored Cable+ currently classified under the Through Penetrating Products category.

See Through Penetrating Product (HLY) category in the Fire Resistance Directory for names of manufacturers. The T Rating is 1 and 1-3/4 hr for 1 and 2 hr rated assemblies, respectively, for cables 3A through 3G. The T Rating is 0 hr for cables 3H and 3I.

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

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - FS011A 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.

SYSTEM NO. F-C-3012
PENETRATION DETAIL
SCALE: N.T.S.

SEE NOTE 22