

1. Floor or Wall Assembly - Min 2-1/2 in. thick lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 8 in.

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

2. Sleeve (Optional) - Nom 8 in. diam (or smaller) Schedule 40 (or heavier) steel pipe or nom 6 in. diam (or smaller) Schedule 40 polyvinyl chloride (PVC) pipe cast into floor or wall assembly. Sleeve to be flush with or project max 2 in. from top surface of floor or both surfaces of wall. When PVC sleeve is used, max cable conductor size is No. 12 AWG.

3. Cables - Aggregate cross-sectional area of cables to be min 10 percent to max 40 percent of the cross-sectional area of the opening. Cables to be rigidly supported on both sides of the floor or wall assembly. Any combination of the following types and sizes of cables may be used:

- A. Max 1000 kcmil single-conductor copper or aluminum power cable; cross-linked polyethylene
- B. Max No. 2/0 AWG multiconductor copper or aluminum power cables; cross-linked polyethylene, polyvinyl chloride, neoprene rubber, hypalon or silicone rubber insulation and jacket materials. C. Max No. 12 AWG multiconductor copper control cables; cross-linked polyethylene, polyvinyl chloride, neoprene rubber, hypalon or silicone rubber insulation and jacket materials.
- D. Max 400 pair No. 24 AWG copper telephone cables; polyvinyl chloride insulation and jacket E. Multiple fiber optical communication cable jacketed with PVC and having a max outside diam of
- F. Max 200 pair No. 22 AWG (or smaller) copper conductor with polyvinyl chloride (PVC) insulation
- and jacketing material. G. Max 3/C No. 3/0 AWG (or smaller) copper or aluminum conductor SER cables with PVC insulation
- H. Max 3/C No. 2/0 AWG (or smaller) copper conductor PVC jacketed aluminum clad or steel clad
- TECK 90 cable. I. Max 3/C with ground No. 8 AWG (or smaller) copper conductor NM cable with PVC insulation and
- J. RG/U coaxial cable with fluorinated ethylene (FE) or PVC insulation and jacket. K. Max 4 pair No. 24 AWG (or smaller) copper conductor data cable with Hylar jacket and insulation. L. Max 3/C No. 12 AWG (or smaller) MC (BX) copper cable with polyvinyl chloride insulation and
- M. Through Penetrating Product* Any cables, Armored Cable+ or Metal Clad Cable+ currently Classified under the Through Penetrating Product category. See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers

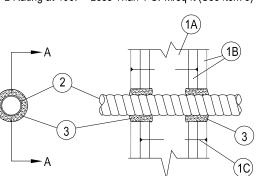
4. Packing Material - Min 1 in. thickness of mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or sleeve or from both surfaces of wall or ends of sleeve as required to accommodate the required thickness of fill material

5. Fill, Void or Cavity Material* - Caulk or Sealant - Applied to fill the through opening to a min thickness of 1 in. flush with the top surface of the floor or sleeve or both surfaces of wall or ends of sleeve. Caulk or sealant to be forced into interstices of cable group to max extent possible. F Rating of firestop systems is dependent upon the through opening size, the thickness of the concrete, the sleeve type and percent cable fill, as tabulated below:

Max Through Opening Diam in.	Min Concrete Thkns in.	Sleeve Type	% Cable Fill	F Rating Hr
6	2½	PVC	15-40	2
6	2½	PVC	10-15	3
6	4 1/2	PVC	10-40	3
6	4 1/2	NONE	10-40	3
6	4 1/2	STEEL	10-40	3
8	2½	NONE	15-40	1½
8	4 ½	NONE	15-33	2
8	2½	NONE	10-15	3
8	2½	STEEL	15-40	1 ½
8	2½	STEEL	10-15	3
8	4 1/2	STEEL	10-22	3

3M COMPANY - CP 25WB+ caulk or FB-3000 WT sealant. *Bearing the UL Classification Marking

System No. W-L-3015 Formerly System No. 328 F Ratings - 1 and 2 Hr (See Item 3) T Ratings - o, 3/4, and 2Hr (See Item 2) L Rating at Ambient - Less than 1 CFM/sq ft (See Item 3) L Rating at 400F - Less Than 1 CFM/sq ft (See Item 3)



SECTION A-A

to be min 3 in. from nearest stud in wall cavity.

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 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 or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC with nom 2 by 4 in. lumber 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. OC. B. Gypsum Board* - Nom 5/8 in. thick, 4 ft. wide with square or tapered edges. The gypsum wallboard type, number of layers and sheet orientation shall be as specified in the individual Wall and Partition Design. Max diam of openings cut in gypsum wallboard is 2 in.

C. Fasteners - When wood stud framing is employed, gypsum wallboard attached to studs with cement coated nails as specified in the individual Wall or Partition Design. When steel channel stud framing is employed, gypsum wallboard attached to studs with Type S self-drilling, self-tapping bugle-head steel screws as specified in the individual Wall or Partition Design. Diam of circular through opening cut through gypsum wallboard on each side of wall assembly to be min 1/4 in. to max 11/16 in. larger than diam of through penetrating product (Item 2) installed in through opening. Side edge of circular opening

2. Through Penetrating Product* - Max four copper conductor No. 2 AWG (or smaller) aluminum or steel Armored Cable+ or Metal-Clad Cable+. Max one armored cable or metal clad cable to be installed near center of circular opening in gypsum

wallboard. Through penetrating product to be rigidly supported on both sides of wall assembly. When installed in 1 hr fire rated wall assembly, T Rating is 0 hr. When installed in 2 hr fire rated wall assembly, T Rating is 3/4 hr when max No. 2 AWG cable is used and 2 hr when max 12 AWG cable is used. C CABLE SYSTEMS INC

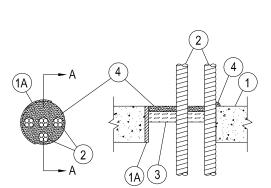
3. Fill, Void or Cavity Material* - Caulk - Caulk fill material forced into annular space around entire circumference of through penetrating product to completely fill opening in gypsum wallboard on each side of the wall assembly. A min 5/8 in. thickness of caulk is required for the 1 hr F Rating. A min 1-1/4 in. thickness of caulk is required for the 2 hr F

MINNESOTA MINING & MFG CO - CP 25WB+. *Bearing the UL Classification Marking

System No. C-AJ-3111 F Rating - 3 Hr T Rating - 0 Hr

manufacturers.

Penetrating Material



SECTION A-A

1. Floor or Wall Assembly - Min 4-1/2 in. thick lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. When individual cable (Item 2) is installed in through opening, diam of opening to be 3/4 in.

to 1-1/2 in. larger than diam of cable. When more than one cable is installed in opening, diam of opening to be sufficient to allow separation between cables for installation of caulk fill material (Item 4). Max diam of opening is 6 in. See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of

1A. Sleeve (Optional) - Nom 6 in. diam (or smaller) Schedule 40 PVC pipe or Schedule 10 (or heavier) steel pipe cast into concrete floor or wall. Sleeve to be flush with or project max 1-1/2 in. from top of surface of floor or both surfaces of wall.

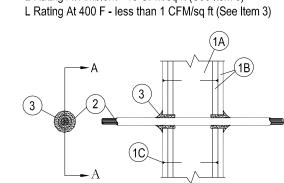
2. Through Penetrating Products* - Max four copper conductor No. 2/0 AWG (or smaller) aluminum or steel Armored Cable# or Metal-Clad Cable#. Aggregate cross-sectional area of cables to be 15 to 30 percent of the cross-sectional area of the opening. Min annular space between cable and edge of through opening is zero in. (point contact). Through penetrating products to be rigidly supported on both sides of floor or wall assembly.

CONDUCTORS CM S A DE C V 3. Packing Material - Polyethylene backer rod or nom 1 in. thickness of mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall as necessary to accommodate the required thickness of caulk fill

4. Fill, Void or Cavity Material* - Caulk - Applied to fill the annular space around the through penetrating product. When an individual cable is installed in a max 3 in. diam through opening, a min 1/2 in. depth of caulk fill material is required. When more than one cable is installed in through opening or through opening is larger than 3 in. diam, a min 1 in. depth of caulk fill material is required. Caulk fill material to be installed flush with top surface of floor. In walls, caulk fill material to be installed flush with wall

surface on both sides of wall assembly. MINNESOTA MINING & MFG CO - CP 25WB+ *Bearing the UL Classification Marking #Bearing the UL Listing Mark

System No.W-L-3001 (Formerly System No. 149) F Ratings - 1 and 2 Hr (See Item 1) T Ratings - 3/4, 1, 1-1/2 and 2 Hr (See Item 2) L Rating At Ambient - 15 CFM/sq ft (See Item 3)



SECTION A-A

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 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 or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC with nom 2 by 4 in. lumber 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 OC. B. Gypsum Board* - Nom 1/2 or 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum wallboard type, thickness, number of layers and sheet orientation shall be as specified in the individual Wall or Partition Design. Diam of circular through opening to be 3/8 in. to 5/8 in. larger than outside

diam of cable or cable bundle. C. Fasteners - When wood stud framing is employed gypsum wallboard layers attached to studs with cement coated nails as specified in the individual Wall or Partition Design. When steel channel stud framing is employed, gypsum wallboard attached to studs with Type S self-drilling, self-tapping bugle-head steel screws as specified in the individual Wall or Partition Design. The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. Cables - Individual cable or max 1 in. diam cable bundle installed in through opening with an annular space of min 0 in. (point contact) to max 3/4 in. Cable to be rigidly supported on both sides of wall assembly. The following types and sizes of cables may be used:

A. Max 150 pair No. 24 AWG copper conductor telephone cable with polyvinyl chloride (PVC insulation and jacket materials. When max 25 pair telephone cable is used, T Rating is 2 hr. When 50 to 150 pair telephone cable is used in 1 hr fire rated wall,

T Rating is 3/4 hr. When 50 to 150 pair telephone cable is used in 2 hr fire rated wall, T Rating is 1 hr. B. Max No. 10 AWG multiple copper conductor Type NM ("Romex") nonmetallic sheathed cable with PVC insulation and jacket materials.

When Type NM cable is used, max T Rating is 1-1/2 hr. C. Multiple fiber optical communication cable jacketed with PVC and having a max outside diam of

When fiber optic cable is used, max T Rating is 2 hr. D. Max 12 AWG multi conductor (max seven conductors) power/control cable with cross-linked

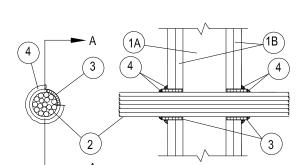
polyethylene (XLPE) insulation and XLPE or PVC jacket materials. When multi conductor power/control cable is used, max T Rating is 2 hr.

E. Max four conductor with ground No. 2 AWG (or smaller) aluminum SER cables with polyvinyl chloride insulation and jacket materials.

3. Fill, Void or Cavity Materials* - Caulk, Sealant or Putty - Caulk or putty fill material installed to completely fill annular space between cable and gypsum wallboard on both sides of wall and with a min 1/4 in. diam bead of caulk or putty applied to perimeter of cable(s) at its egress from each side of

3M COMPANY - MP+ Stix putty, CP 25WB+ caulk, FB-3000 WT sealant or Cable Wrap putty (Note: L Ratings apply only when CP 25WB+ caulk or FB-3000 WT sealant is used.) *Bearing the UL Classification Mark

System No.W-L-3030 May 19, 2005 F Ratings - 1 and 2 Hr (See Item 1) T Rating - 1/2 Hr L Rating At Ambient - 76 CFM/sq ft (See Item 4) L Rating At 400 F - 7 CFM/sq ft (See Item 4)



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 described in the individual U300, U400 or V400 Series Wall or Partition Designs in the UL Fire Resistance Directory and shall include the following construction

A. Studs - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 in. by 4 in. (51 mm by 102 mm) lumber spaced 16 in. (406 mm) OC with nom 2 in. by 4 in. (51 mm by 102 mm) lumber end plates and cross braces. Steel studs to be min 3-5/8 in. (92 mm) wide by 1-3/8 in. (35 mm) deep channels spaced max 24 in. (610 mm) OC. B. Gypsum Board* - Nom 5/8 in. (16 mm) thick, 4 ft. (122 cm) wide with square or tapered edges.

individual Wall and Partition Design. Diam of circular cutout in gypsum wallboard layers on each side of wall to be 1/2 in. to 3/4 in. (13 mm to 19 mm) larger than diam of tight cable bundle (Item 2). Max diam of cutouts is 4-1/2 in. (114 mm).

The gypsum wallboard type, number of layers and sheet orientation shall be as specified in the

The hourly F Rating of the firestop system is 1 hr when installed in a 1 hr fire rated wall and 2 hr when installed in a 2 hr fire rated wall.

2. Cables - Max 4 in. (102 mm) diam tight bundle of cables centered in circular cutouts in gypsum wallboard and rigidly supported on both sides of wall assembly. Any combination of the following types and sizes of copper conductor cables may be used: A. Max 350 kcmil single-conductor power cables; cross-linked polyethylene (XLPE) or

polyvinyl chloride (PVC) insulation. B. Max 7/C No. 12 AWG cables; PVC insulation and jacket. C. Max 3/C No. 2/0 AWG multi conductor power and control cables; XLPE or PVC insulation,

D. Max 200 pair No. 24 AWG telecommunication cables; PVC insulation and jacket.

E. Max 6/94 Fiber Optic (F.O.) cable; PVC insulation and jacket.

3. Fill, Void or Cavity Material* - Wrap Strip - Nom 1/4 in. (6 mm) thick intumescent elastomeric material faced on one side with aluminum foil, supplied in nom 2 in. (51 mm) wide strips. Nom 2 in. (51 mm) wide strip tightly-wrapped around cable bundle (foil side out) with seam butted. Wrap strip layer

securely bound with steel wire tie and slid into annular space approx 1-1/4 in. (32 mm) such that approx 3/4 in. (19 mm) of the wrap strip width protrudes from the wall surface on each side of the

3M COMPANY - FS-195+

*Bearing the UL Classification Marking

4. Fill, Void or Cavity Materials* - Caulk, Sealant or Putty - Min 1/4 in. (6 mm) diam continuous bead of caulk or putty applied to the wrap strip/wall interface and to the exposed edge of the wrap strip approximate 3/4 in. (19 mm) from the wall surface on each side of wall assembly. Caulk or putty to be forced into the interstices of the cable bundle to the max extent possible within the confines of the wrap strip on each side of the wall assembly.

3M COMPANY - CP 25WB+, IC 15WB+, FireDam 150+ caulk, FB-3000 WT sealant or (Note: L Ratings apply only when CP 25WB+ caulk or FB-3000 WT is used.)

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DESIGNER

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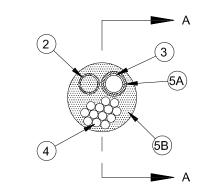
MEP ENGINEER

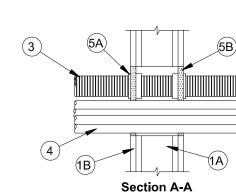
589 8TH AVENUE NEW YORK, NY, 10018 CONTACT: ERIC MARTINSEN TEL: 212.736.9600 E: EMARTINSEN@FISKAA.COM

STRUCTURAL ENGINEER

ARMOUR UNSDERFER ENGINEERING INC. P.S. 555 116TH AVE NE, SUITE 118 BELLEVUE WA 98004 CONTACT: BRIAN UNSDERFER TEL: 425.614.0949 E: brianu@au-eng.com

System No.W-L-8056 F Ratings - 1 and 2 Hr (See Item 1) T Rating - 1/2 Hr





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 or U400 Series Wall or 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

102mm) 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) B. Gypsum Board* - Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Max diam of opening is 8 in. (203 mm).

2. Metallic Penetrants - One or more metallic pipes, conduits or tubing installed concentrically or eccentrically within the opening. Annular space between metallic penetrants and periphery of opening to be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). Annular space between metallic penetrants and nonmetallic penetrants or cables to be min 1/2 in. (13 mm) to max 1-1/2 in. (38 mm) Metallic pipes, conduits or tubing to be rigidly supported on both sides of wall assembly. Any combination of the following types and sizes of metallic pipes, conduits or tubing may be installed within the opening: A. Steel Pipe - Nom 2 in. (51 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe. B. Iron Pipe - Nom 2 in (51 mm) diam (or smaller) cast or ductile iron pipe.

C. Conduit - Nom 2 in. (51 mm) diam (or smaller) rigid steel conduits, electrical metallic tubing (EMT) or flexible steel or aluminum conduit.

3. Electrical Nonmetallic Tubing (ENT)+ - Nom 2 in, (51 mm) diam (or smaller) ENT formed of PVC, installed in accordance with Article 331 of the National Electrical Code (NFPA No. 70). One or more ENT installed concentrically or eccentrically within the opening. Annular space between ENT and periphery of opening to be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). Annular space between ENT and metallic penetrants or cables to be min 1/2 in. (13 mm) to max 1-1/2 in. (38 mm). ENT to be rigidly supported on both sides of the wall assembly.

See Electrical Nonmetallic Tubing (FKHU) in UL Electrical Construction Materials Directory for names of manufacturers.

4. Cables - Nom 4 in. (102 mm) diam (or smaller) tight bundle of cables. Cable bundle spaced min 1/2 in. (13 mm) to max 1-1/2 in. (38 mm) from metallic and nonmetallic penetrants. Cable bundle spaced 0 in. (0 mm, point contact) to 2 in. (51 mm) from periphery of opening. Cable bundle to be rigidly supported on both sides of wall assembly. Any combination of the following types and sizes of cables may be used:

A. Max 100 pair No. 24 AWG (or smaller) copper conductor with polyvinyl chloride (PVC) insulation and jacket B. Max 1/C No. 500 kcmil (or smaller) copper conductor cable with cross-linked polyethylene (XLPE) jacket.

C. Max 7/C No. 12 AWG (or smaller) copper conductor power and control cables with XLPE or PVC insulation with XLPE or PVC jacket D. Max 4/C No. 4/0 AWG (or smaller) copper or aluminum conductor SER cables with PVC insulation and jacket. E. Max 3/C No. 2/0 AWG (or smaller) copper conductor PVC jacketed aluminum clad or steel clad TEK cable. F. Max 110/125 fiber optic (F.O.) cable with PVC insulation and jacket.

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

H. Max RG/U coaxial cable with fluorinated ethylene insulation and jacket. I. Max 4 pair No. 24 AWG (or smaller) copper conductor data cable with PVC jacket and insulation. J. Max 4/C with ground No. 2/0 (or smaller) aluminum or copper conductor Metal-Clad+ or Armored-Clad+ cable with steel or aluminum jacketing.

AFC CABLE SYSTEMS INC

5. Firestop System - The firestop system shall consist of the following: A. Fill, Void or Cavity Material* - Wrap Strip - Nom 1/8 or 3/16 in. (3.2 or 4.8 mm) thick intumescent material faced on both sides with a plastic film, supplied in 2 in. (51 mm) wide strips, or nom 1/4 in. (6 mm) thick intumescent material faced on both sides with a plastic film, supplied in 1-1/2 in, (38 mm) wide strips. Single layer wrapped around each individual ENT and secured with a single layer of foil tape. Wrap strip recessed within opening such that ends project a max 1/4 in. (6 mm) on each

SPECIFIED TECHNOLOGIES INC - SpecSeal RED Wrap Strip, SpecSeal BLU Wrap Strip or SpecSeal BLU2 Wrap B. Fill, Void or Cavity Material* - Sealant - Min 5/8 in. (16 mm) thickness of fill material applied flush with both surfaces of wall. At point contact locations, apply a min 3/8 in. (10 mm) diam bead of fill material at the penetrant/gypsum board interface SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant or SpecSeal LCI Sealant

*Bearing the UL Classification Mark

+Bearing the UL Listing Mark

surface of the wall.

Sanitary, Waste Vent Gypsum Stud Wal 1 Hr W-L-1001 U465 and Drain Piping Sanitary, Waste Vent | Concrete and Steel Deck 2" - 4" 2 Hr CAJ-1175 D907 Floor/Ceiling Cast Iron Drain Piping Water Gypsum Stud Wall 1 Hr W-L-1001 U465 Water 4" Copper CAJ-1175 Floor/Ceiling 4" PVC Heating/Water Gypsum Stud Wall 1 Hr W-L-2002 U465 Concrete and Steel Decl Heating/Water D907 2 Hr FA-2002 Floor/Ceiling Sprinkler Piping Gypsum Stud Wall W-L-1001 Schedule 10 4" Schedule Gas Piping Gypsum Stud Wall 2 Hr W-L-1001 U411 Concrete and Steel Dec 4" Schedule Gas Piping 2 Hr CAJ-1175 D907 Floor/Ceiling Telephone/Rome Gypsum Stud Wall W-L-3001 **PVC Insulated** Bundle of Various Cables Cables - 4" Max. Gypsum Stud Wall W-L-3030 PVC Insulated 2 Hr Concrete and Steel Deck Various Cables -Cables - 4" Max. 2 Hr CAJ-3030 D907 PVC Insulated Floor/Ceiling Armored Cable Gypsum Stud Wall W-L-3015 Armored Cable (Bx.) Concrete and Steel Deck 2 Hr CAJ-3111 D907 Floor/Ceiling Single and Multiple Electrical Gypsum Stud Wall 1 Hr CLIV PUTTY U465 Outlet Box

Notes: * Back to Back Electrical Boxes Less Than 24" Apart Penetrating Through UL Fire Rated Walls

Shall Receive "3M Fire Barrier Moldable Putty +" Or Equal Per Manufacturers Installation

Requirements to Ensure Fire Rated Seal.

Fire 3M Assembly U.L.

. ISSUE FOR HISTORIC REVIEW 07/01/15 A ISSUE FOR HISTORIC REVIEW 07/16/15 B. ISSUE FOR LL REVIEW/PRELIM 07/10/15 . ISSUE FOR DEMO PERMIT

FAT FACE PORTLAND 34 EXCHANGE STREET PORTLAND, ME 04104

Drawing Title FIRE STOPPING DETAILS

Project No. Drawn By _---



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