Firstopping Selection and Installation guide for Bowling Green State University.

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Section A:

Firestopping Installation Selection Chart

Firestopping Installation Selection Chart

Concrete Construction (Floors)

Guidelines for using these Charts

1. Determine Wall or Floor Construction type
2. Determine size and type of material penetrating the wall or floor.
3. Determine the required rating (hourly) of the wall or floor.
4. Match the penetrating item with the required rating in the appropriate table.

Construction **Concrete Floor**
Penetrating item **Metal**

Penetration Size	Rating		
Steel Pipe	**1 Hour**	**2 Hour**	**3 Hour**
Up to 6"	**1**	**1**	**1**
>6" up to 30"	**2**	**2**	**2**
Copper			
Up to 4"	**1**	**1**	**1**
>4" up to 6"	**2**	**2**	**2**
Conduit			
Up to 4"	**1**	**1**	**1**

Construction **Concrete Floor**
Penetrating item **Non-Metallic**

Penetration Size			
Plastic Pipe			
Up to 2"	**3**	**3**	**3**
>2" up to 6"	**4**	**4**	**4**
>6" up to 8"	**5**	**5**	**5**
Conduit			
Up to 2"	**3**	**3**	**3**
>2" up to 6"	**4**	**4**	**4**
>6" up to 8"	**5**	**5**	
Cables			
Up to 6" Opening	**6**	**6**	**6**

Construction **Concrete Floor**
Penetrating item **None**

Blank Openings			
Up to 8"	**7**	**7**	**7**

Concrete Construction (Walls)

Construction **Concrete Wall**

Penetrating item **Metal**

Penetration Size	Rating		
Steel Pipe	**1 Hour**	**2 Hour**	**3 Hour**
Up to 30"	**8**	**8**	**8**
Copper			
Up to 6"	**8**	**8**	**8**
Conduit			
Up to 4"	**8**	**8**	**8**

Construction **Concrete Wall**

Penetrating item **Non-Metallic**

Penetration Size	Rating		
Plastic Pipe	**1 Hour**	**2 Hour**	**3 Hour**
Up to 2"	**9**	**9**	**9**
>2" up to 6"	**10**	**10**	**10**
>6" up to 8"	**11**	**11**	**11**
Conduit			
Up to 2"	**9**	**9**	**9**
>2" up to 6"	**10**	**10**	**10**
>6" up to 8"	**11**	**11**	**11**
Cables			
Up to 6"	**12**	**12**	**12**

Construction **Concrete Wall**

Penetrating item **None**

Blank Openings			
Up to 8"	**13**	**13**	**13**

Construction	Wood Floor/Gypsum Ceiling	
Penetrating item	Metal	

Penetration Size	Rating	
Steel Pipe	1-Hour	2-Hour
Up to 4"	14	14
Conduit		
Up to 4"	14	14

Construction	Wood Floor/Gypsum Ceiling
Penetrating item	Non-Metallic

Penetration Size	Rating
Plastic Pipe	1-Hour
Up to 4"	15
Conduit	
Up to 4"	15
Multiple Plastic Drains	
Up to 4"	16
Cable(s)	17

Construction	Gypsum Walls			
Penetrating item	Metal			
Penetration Size	Rating			
Steel Pipe	1-Hour	2-Hour	3-Hour	4-Hour
Up to 12"	18	18	18	18
>12 up to 24"	19	19	19	19
Copper				
Up to 6"	18	18	18	18
Conduit				
Up to 6"	18	18	18	18

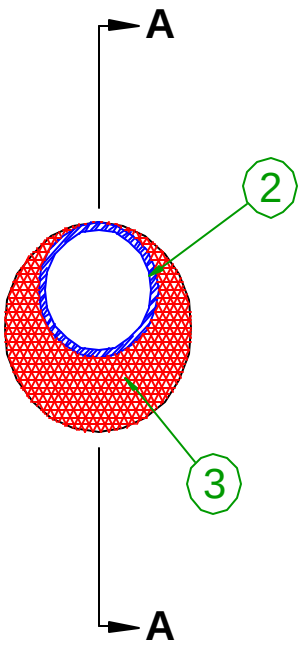
Construction	Gypsum Walls	
Penetrating item	Non-Metalllic	
Penetration Size	Rating	
Plastic Pipe	1 Hour	2 Hour
Up to 2"	20	20
Up to 8"	21	21
Cables		
Single Cable	22	
Multiple Cables	23	

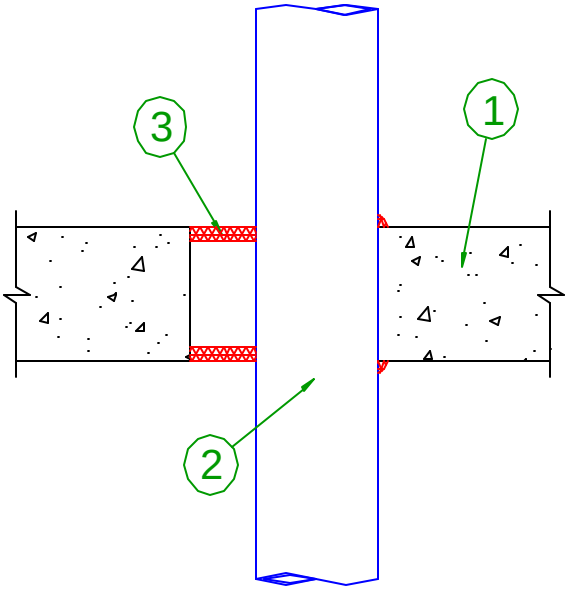
Section B:

Installation Designs

Construction	**Concrete Floor**
Penetrating Material	**Metal (Pipe & Conduit)**
Rating (hours)	**1,2 and 3**
Max. Pipe Size (in)	**6”**
Ref. #	**CAJ1259F**

Design # 1





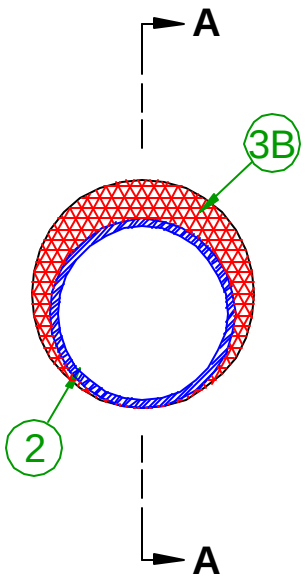
Section A-A

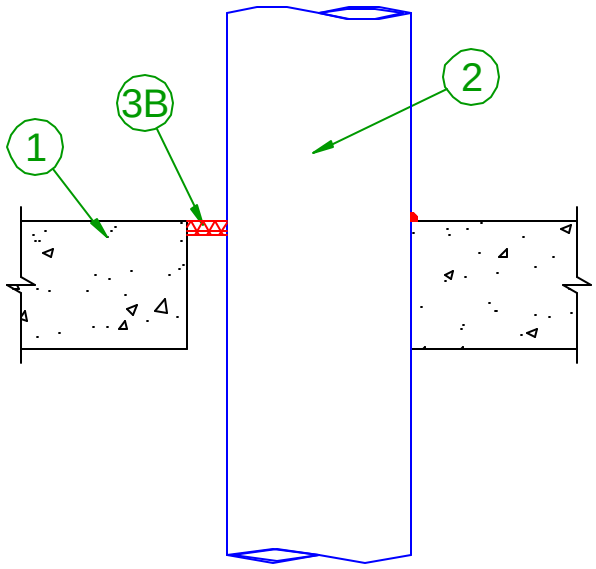
1. Floor Assembly
2. Pipe (Penetrant)
3. Fill Material (SpecSeal 100 Sealant)

- The penetrant must be rigidly supported on both sides of the assembly.
- The penetrant must have an annular space between 0” (point of contact) minimum and a maximum of 3”.
- A minimum of ½” thickness of fill material must be applied within the annulus, flush with the top surface of the floor or both surfaces of the wall.
- A minimum ¼” diameter bead of sealant shall be applied at the pipe/concrete interface on both sides of the floor.

Construction	**Concrete Floor**
Penetrating Material	**Metal (Pipe & Conduit)**
Rating (hours)	**1,2 and 3**
Max. Pipe Size (in)	**30”**
Ref. #	**CAJ1080F**

Design # 2





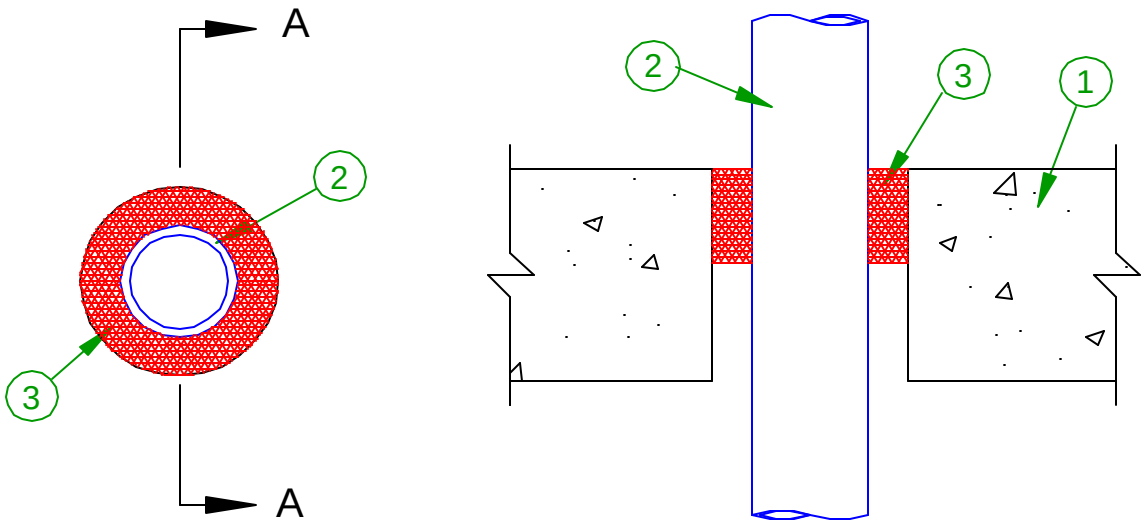
Section A-A

1. Concrete Floor Assembly
2. Pipe (Penetrant)
3B. Fill Material (SpecSeal 100 Sealant)

- The penetrant must be rigidly supported on both sides of the assembly.
- Steel pipe must be Schedule 5 or greater.
- The penetrant must have an annular space between point contact (0”) minimum and a maximum of 2”.
- A minimum of ½” thickness of fill material must be applied within the annulus, flush with the top surface of the floor or both surfaces of the wall.
- A minimum ¼” diameter bead of sealant shall be applied at the pipe/concrete interface on the top surface of the floor.

Construction	**Concrete Floor**
Penetrating Material	**Non-Metallic (Pipe & Conduit)**
Rating (hours)	**1,2 and 3**
Max. Pipe Size	**2”**
Ref. #	**CAJ2031F**

Design # 3



Section A-A

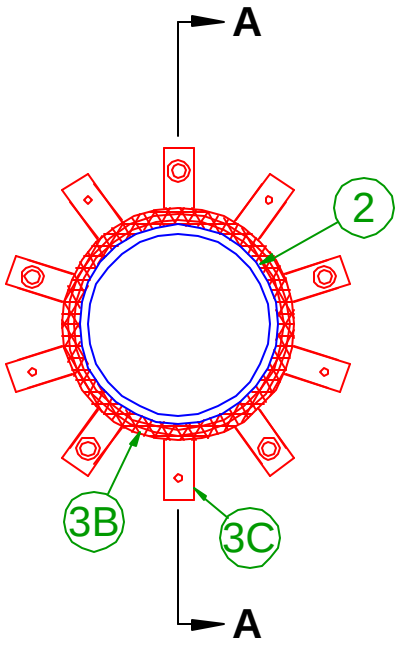
1. Concrete floor assembly
2. Pipe (Penetrant)
3. Fill Material(SpecSeal 100 Sealant)

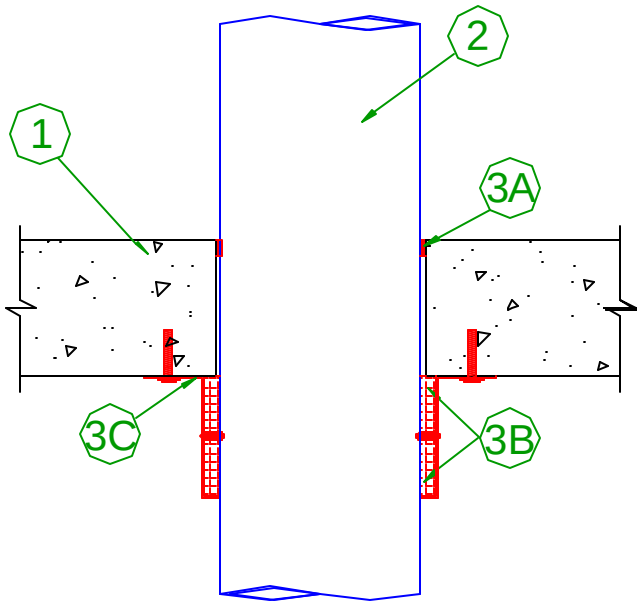
- The penetrant must be rigidly supported on both sides of the assem bly.
- Fill material must be applied within the annulus, flush with the top surface of the floor.

TYPE OF PENETRANT	MAXIMUM DIAMETER OF PENETRANT	MINIMUM FILL THICKNESS	MINIMUM, MAXIMUM ANNULAR SPACE
PVC or CPVC Pipe	2	2	5/16, 13/16
RNC	2	2	5/8
PVC or CPVC Pipe	1 ½	1	5/16, 13/16
RNC	1 ½	1 ½	5/8
PVC or CPVC Pipe	1	1 ½	5/16, 13/16
RNC	1	1	5/8
ENT	¾	1	1/4, 1 3/8

Construction	**Concrete Floor**
Penetrating Material	**Non-Metallic (Pipe & Conduit)**
Rating (hours)	**1,2 and 3**
Max. Pipe Size	**6”**
Ref. #	**CAJ2089F**

Design # 4





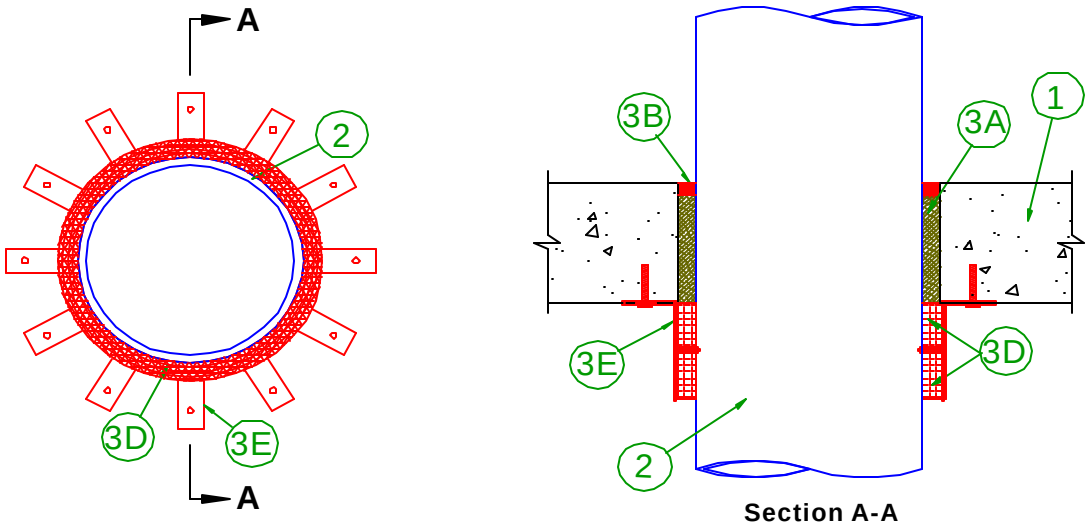
Section A-A

1. Concrete Floor Assembly
2. Pipe (Penetrant)
3A. Fill Material (SpecSeal 100 Sealant)
3B. Wrap Strip (2 Stacks, SpecSeal BLU Wrap Strip)
3C. Steel Collar

- Pipe or conduit to be rigidly supported on both sides of floor.
- One nonmetallic pipe or conduit to be installed concentrically or eccentrically within the firestopping system. The annular space between the pipe or conduit and the periphery of the opening shall be minimum of 3/16”.
- A minimum of ½” thickness of fill material must be applied within the annulus, flush with the top surface of the floor. A minimum of ¼” diameter bead of fill material shall be applied at the interface of the penetrant and wall at the top surface of the floor.
- Nominal ¼” thick by 2” wide wrap strips shall used.
- Two stacks of wrap strips shall be installed on the bottom of the floor assembly. A stack consists of three wrap strips.
- The edge of the wrap strips shall abut the bottom of the floor assembly.
- A minimum ½” wide by 0.028” thick stainless steel hose clamp shall be installed 2” on center to tighten the collar around the wrap strips and the penetrant.
- The collar shall be secured to the concrete surface with ¼” diameter by a minimum 1 ¼” long concrete wedge anchors in conjunctions with a minimum 1” diameter steel fender washers.

Construction	**Concrete Floor**
Penetrating Material	**Non-Metallic, (Pipe & Conduit)**
Rating (hours)	**1,2**
Max. Pipe Size	**8”**
Ref. #	**CAJ2104F**

Design # 5



Section A-A

1. Concrete Floor Assembly
2. Penetrant
3A. Packing Material (Mineral Wool)
3B. Fill Material (SpecSeal 100 Sealant)
3D. Wrap Strips (2 Stacks, SpecSeal BLU Wrap Strip)
3E. Steel Collar

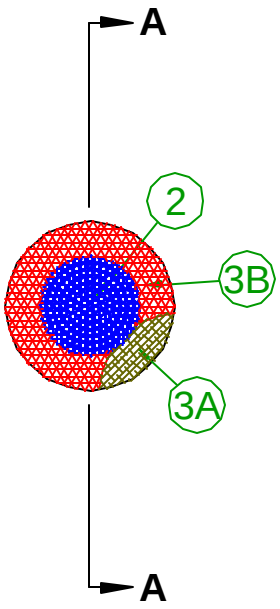
- Pipe or conduit to be rigidly supported on both sides of floor or wall.
- One nonmetallic pipe or conduit to be installed concentrically or eccentrically within the firestopping system. The annular space between the pipe or conduit and the periphery of the opening shall be minimum of 11/16”.
- A minimum of ½” thickness of fill material must be applied within the annulus, flush with the top surface of the floor.
- A minimum 4” thickness mineral wool (4 psf or greater) shall be packed firmly into opening as a permanent form. The packing material shall be recessed accordingly to accommodate the ½” depth of caulking necessary.
- Aluminum foil tape shall be wrapped around the outer circumference of the penetration with a 1” wide overlap along the perimeter joint. This tape shall abut both sides of the wall and extend a minimum of 5” below the bottom surface.
- The wrap strips shall be 2” wide with a nominal thickness of 3/16”
- Two stacks of wrap strips shall be installed on each side of the wall. The number of wrap strips per stack is dependant upon the diameter of the through penetrant.

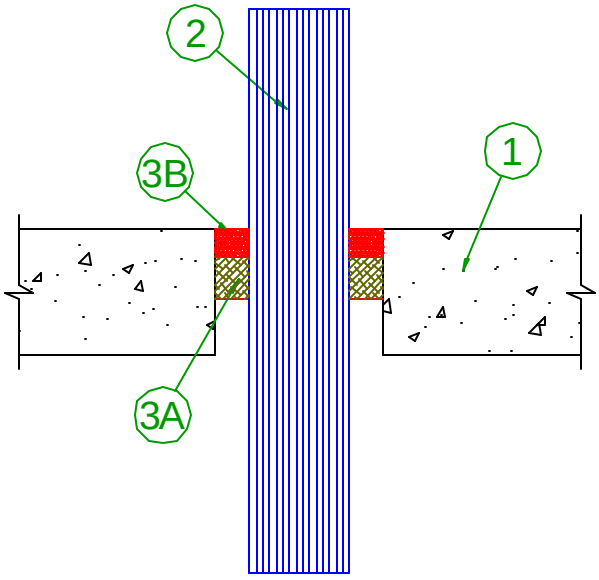
Diameter of through Penetrant	Layers of Wrap Strips Per Stack
6”	**3**
8”	**4**

- The collar shall be tightened around the wrap strips and the through penetrant by the steel hose clamp place 2” in center.
- The collar shall be secured to the concrete surface with ¼” diameter by a minimum 1 ¼” long steel concrete wedge anchors in conjunction with a minimum of 1” diameter steel fender washers.

Construction	**Concrete Floor**
Penetrating Material	**Cable(s)**
Rating (hours)	**1,2 and 3**
Max. Hole Size	**6”**
Ref. #	**CAJ3043F**

Design # 6





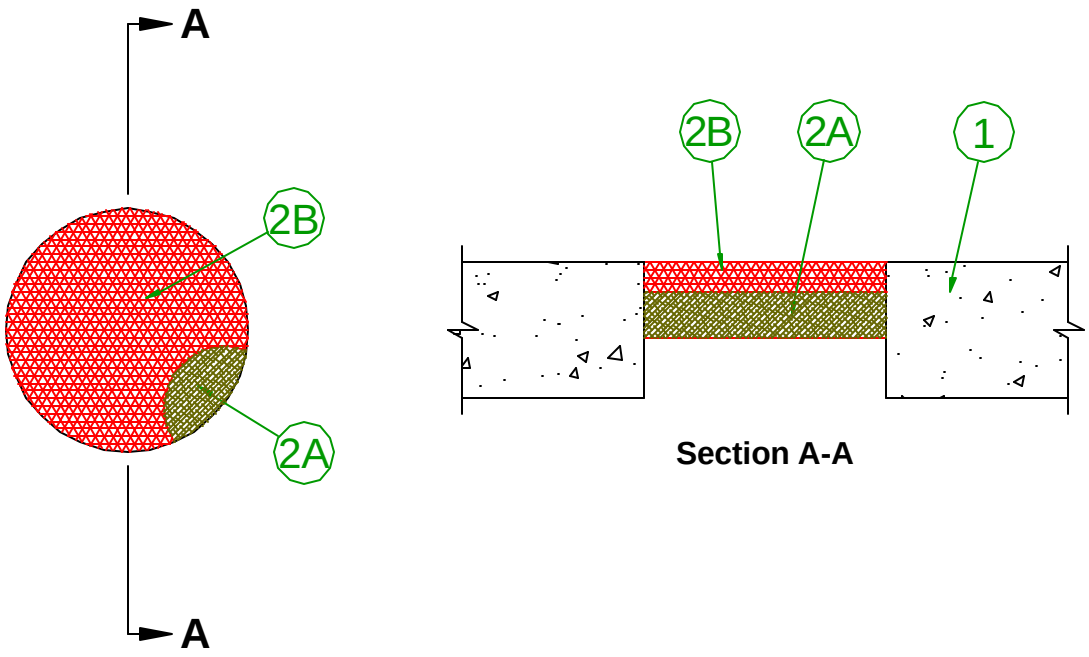
Section A-A

1. Floor Assembly
2. Cables
3A. Packing Material (Mineral Wool)
3B. Fill Material (SpecSeal 100 Sealant)

- The maximum diameter of the opening is 6”
- The cable shall be rigidly supported on both sides of the floor assembly.
- The packing material shall consist of a minimum thickness 1 ½” (6 psf minimum) packed firmly into the opening in a permanent form.
- The packing material shall be recessed 1” from both wall surfaces to accommodate the required sealant thickness.
- A minimum of 1” thickness of sealant shall be applied within the annulus, flush with the floor.

Construction	**Concrete Floor**
Penetrating Material	**None**
Rating (hours)	**1,2 and 3**
Max. Hole Size	**8”**
Ref. #	**CAJ0014**

Design #7



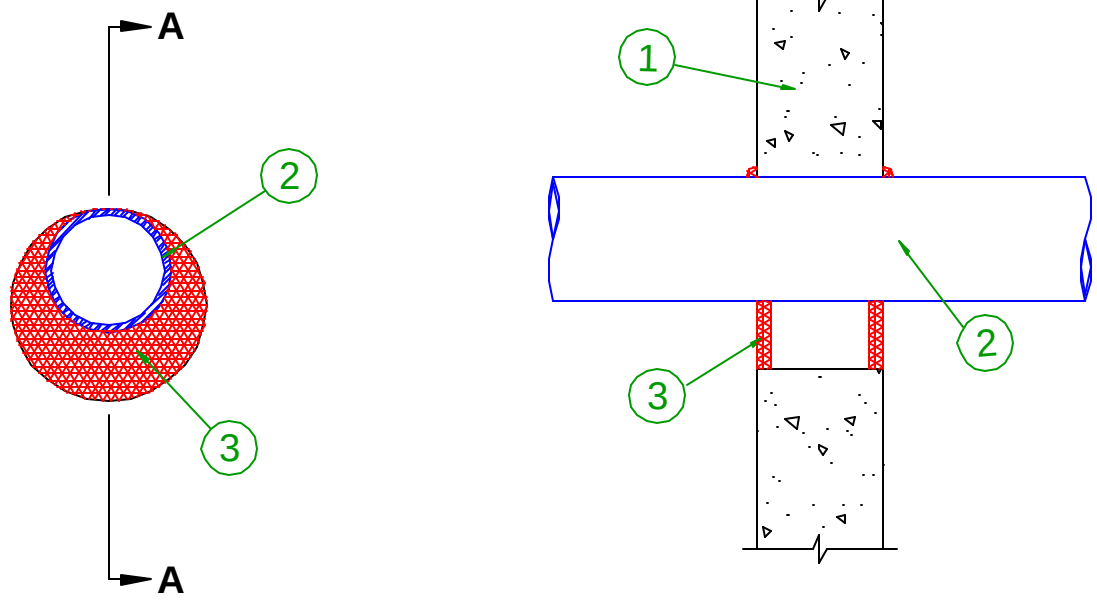
Section A-A

1. Concrete Floor
2A. Packing Material (Mineral Wool)
2B. Fill Material (SpecSeal 100 Sealant)

- The maximum diameter of the opening is 8”
- A minimum of 1 ½” thick mineral wool (6psf) shall be firmly packed into the opening as a permanent form and shall be recessed to accommodate the thickness of the fill material.
- A minimum of 1” thickness of fill material must be applied within the annulus, flush with the top surface of the floor.

Construction	**Concrete Wall**
Penetrating Material	**Metal (Pipe & Conduit)**
Rating (hours)	**1,2 and 3**
Max. Pipe Size (in)	**30”**
Ref. #	**CAJ1080W**

Design # 8



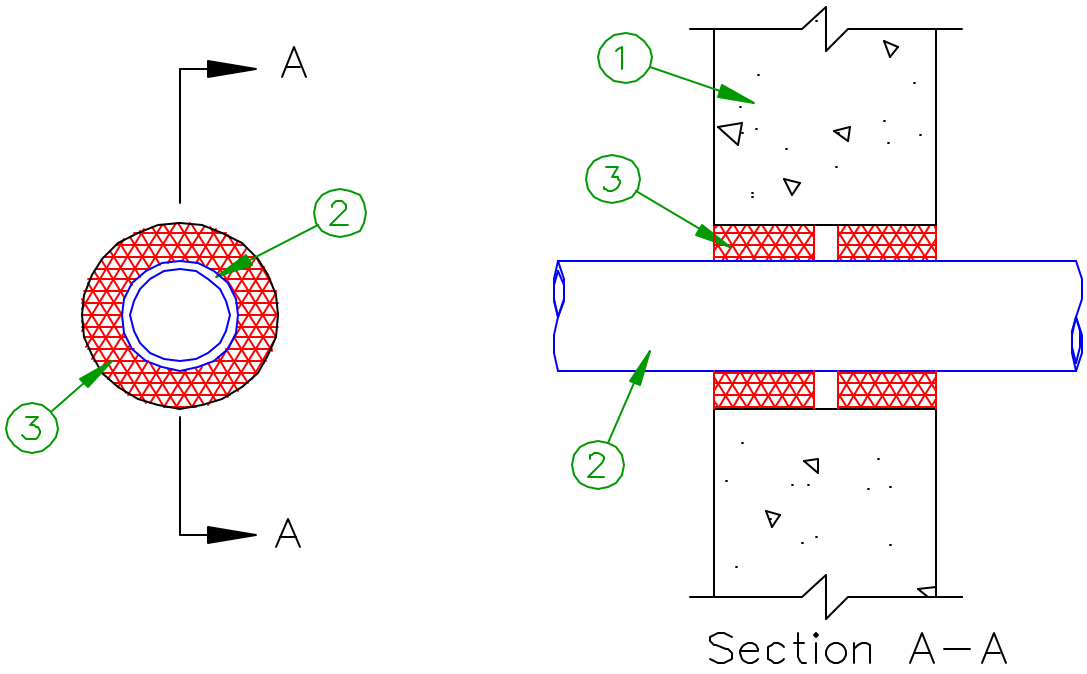
Section A-A

1. Concrete Wall Assembly
2. Pipe (Penetrant)
3. Fill Material (SpecSeal 100 Sealant)

- The penetrant must be rigidly supported on both sides of the assembly.
- The penetrant must have an annular space between 0” (point of contact) minimum and a maximum of 3”.
- A minimum of ½” thickness of fill material must be applied within the annulus, flush with both surfaces of the wall.
- A minimum ¼” diameter bead of sealant shall be applied at the pipe/concrete interface on both sides of the wall.

Construction	**Concrete Wall**
Penetrating Material	**Non-Metallic (Pipe & Conduit)**
Rating (hours)	**1,2 and 3**
Max. Pipe Size (in)	**2”**
Ref. #	**CAJ2031W**

Design # 9



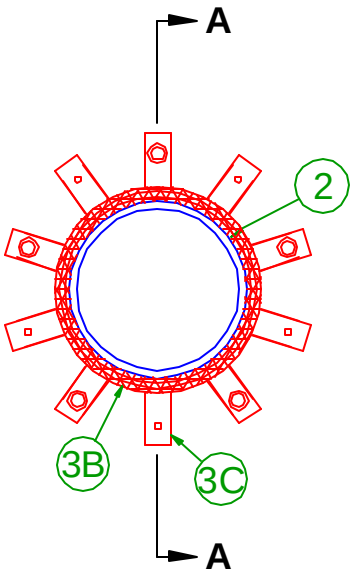
1. Concrete floor assembly
2. Pipe (Penetrant)
3. Sealant Within Annular Space

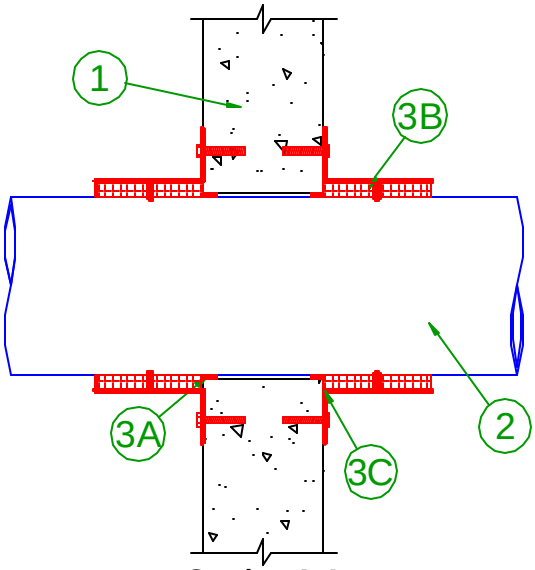
- The penetrant must be rigidly supported on both sides of the assembly.
- Fill material must be applied within the annulus, flush with both surfaces of the wall.

TYPE OF PENETRANT	MAXIMUM DIAMETER OF PENETRANT	MINIMUM FILL THICKNESS	MINIMUM, MAXIMUM ANNULAR SPACE
PVC or CPVC Pipe	2	2	5/16, 13/16
RNC	2	2	5/8
PVC or CPVC Pipe	1 ½	1	5/16, 13/16
RNC	1 ½	1 ½	5/8
PVC or CPVC Pipe	1	1 ½	5/16, 13/16
RNC	1	1	5/8
ENT	¾	1	1/4, 1 3/8

Construction	**Concrete Wall**
Penetrating Material	**Non-Metallic (Pipe & Conduit)**
Rating (hours)	**1,2 and 3**
Max. Pipe Size (in)	**6”**
Ref. #	**CAJ2089W**

Design # 10





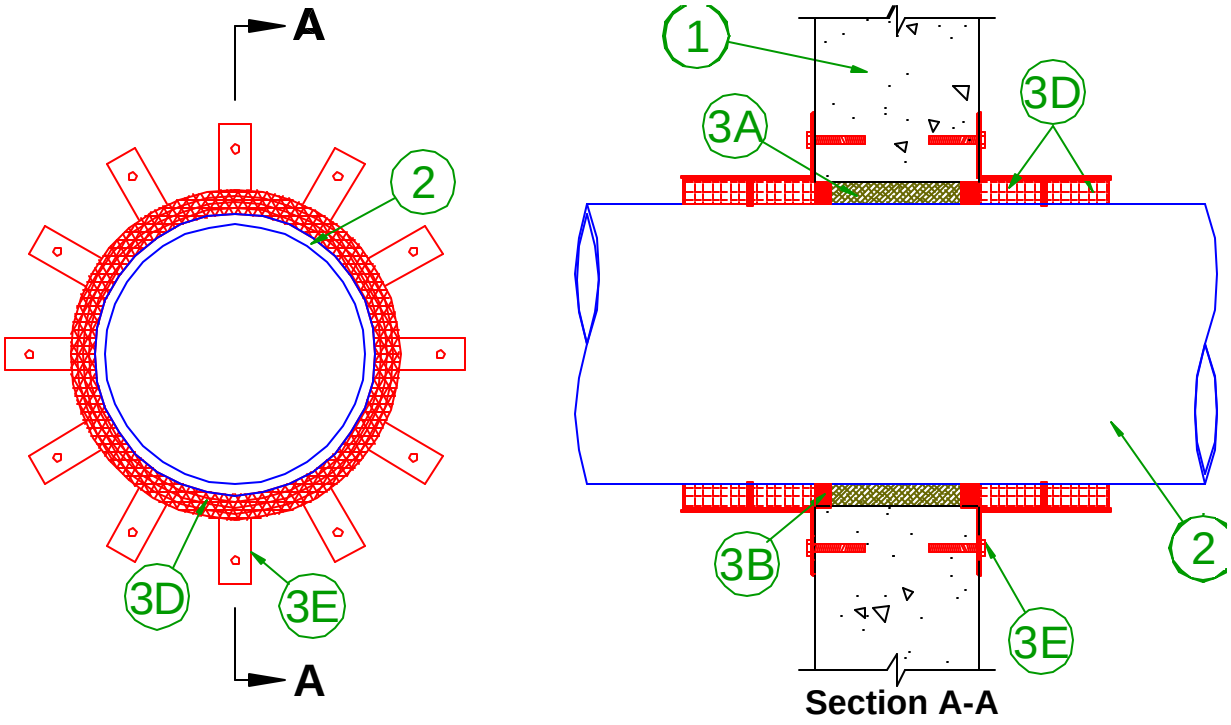
Section A-A

1. Concrete Wall Assembly
2. Pipe (Penetrant)
3A. Packing Material (Mineral Wool)
3B. Fill Material (SpecSeal 100 Sealant)
3D. Wrap Strip (Two Stacks, SpecSeal BLU Wrap Strip)
3E. Steel Collar

- Pipe or conduit to be rigidly supported on both sides of wall.
- One nonmetallic pipe or conduit to be installed concentrically or eccentrically within the firestopping system. The annular space between the pipe or conduit and the periphery of the opening shall be minimum of 3/16”.
- A minimum of ½” thickness of fill material must be applied within the annulus, flus h with the both wall surfaces. A minimum of ¼” diameter bead of fill material shall be applied at the interface of the penetrant and wall on both sides.
- Nominal ¼” thick by 2” wide wrap strips shall used.
- Two stacks of wrap strips shall be installed on each side of the wall. A stack consists of three wrap strips.
- The edge of the wrap strips shall abut both sides of the wall assembly.
- A minimum ½” wide by 0.028” thick stainless steel hose clamp shall be installed 2” on center to tighten the collar around the wrap strips and the penetrant.
- The collar shall be secured to the concrete surface with ¼” diameter by a minimum 1 ¼” long concrete wedge anchors in conjunctions with a minimum 1” diameter steel fender washers.

Construction	**Concrete Wall**
Penetrating Material	**Non-Metallic (Pipe & Conduit)**
Rating (hours)	**1,2**
Max. Pipe Size (in)	**8”**
Ref. #	**CAJ2104**

Design # 11

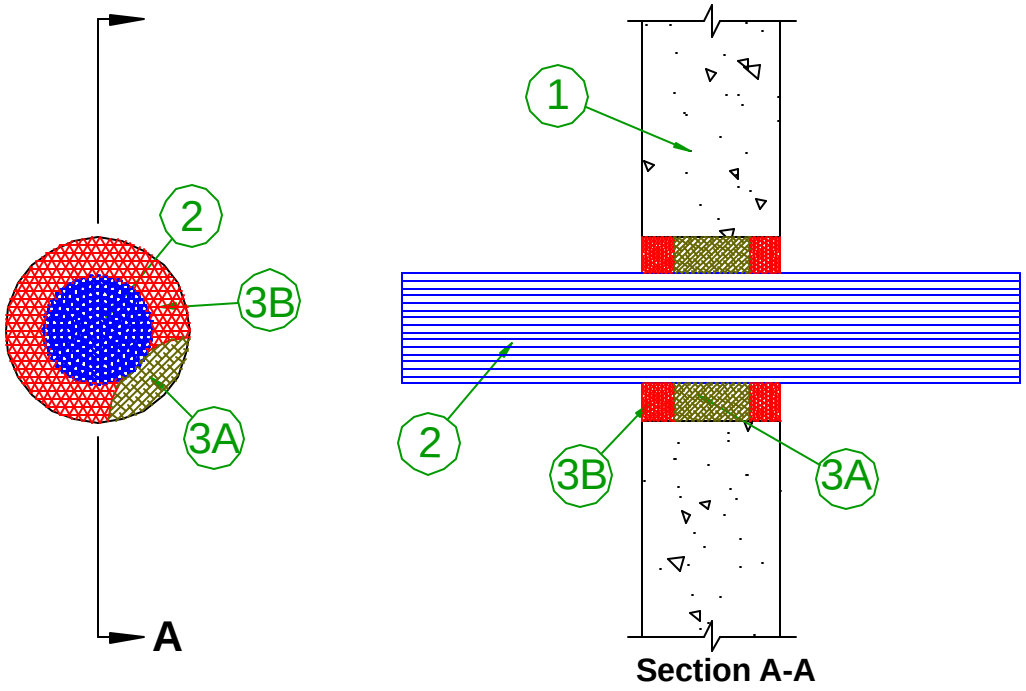


1. Concrete Wall Assembly
2. Pipe (Penetrant)
3A. Packing Material (Mineral Wool)
3B. Fill Material (SpecSeal 100 Sealant)
3D. Wrap Strip (Two stacks, SpecSeal BLU Wrap Strip)
3E. Steel Collar

- Pipe or conduit to be rigidly supported on both sides of floor or wall.
- One nonmetallic pipe or conduit to be installed concentrically or eccentrically within the firestopping system. The annular space between the pipe or conduit and the periphery of the opening shall be minimum of 11/16”.
- A minimum of ½” thickness of fill material must be applied within the annulus, flush with the both wall surfaces.
- A minimum 4” thickness mineral wool (4 psf or greater) shall be packed firmly into opening as a permanent form. The packing material shall be recessed accordingly to accommodate the ½” depth of caulking necessary.
- Aluminum foil tape shall be wrapped around the outer circumference of the penetration with a 1” wide overlap along the perimeter joint. This tape shall abut both sides of the wall and extend a minimum of 5”beyond both wall surfaces.
- The wrap strips shall be 2” wide with a nominal thickness of 3/16”

Construction	**Concrete Wall**
Penetrating Material	**Cable(s)**
Rating (hours)	**1,2 and 3**
Max. Hole Size	**6”**
Ref. #	**CAJ3043W**

Design # 12

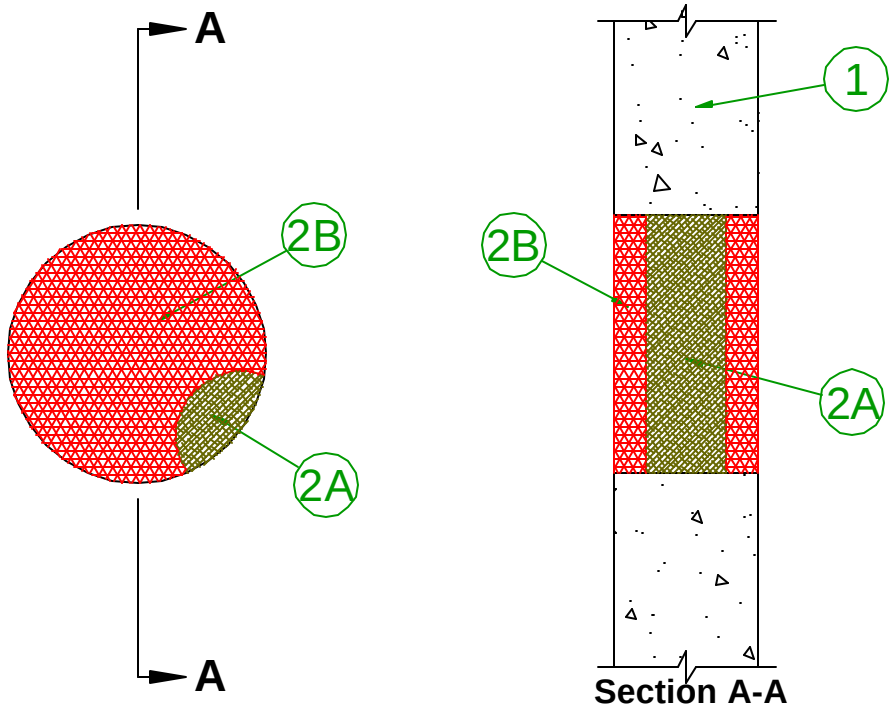


1. Wall Assembly
2. Cables
3A. Packing Material (Mineral Wool)
3B. Fill Material (SpecSeal 100 Sealant)

- The maximum diameter of the opening is 6”
- The cable shall be rigidly supported on both sides of the wall assembly.
- The packing material shall consist of a minimum thickness 1 ½” (6 psf minimum) packed firmly into the opening in a permanent form.
- The packing material shall be recessed 1” from both wall surfaces to accommodate the required sealant thickness.
- A minimum of 1” thickness of sealant shall be applied within the annulus, flush with both wall surfaces.

Construction	**Concrete Wall**
Penetrating Material	**None**
Rating (hours)	**1,2 and 3**
Max. Hole Size	**8”**
Ref. #	**CAJ0014W**

Design # 13

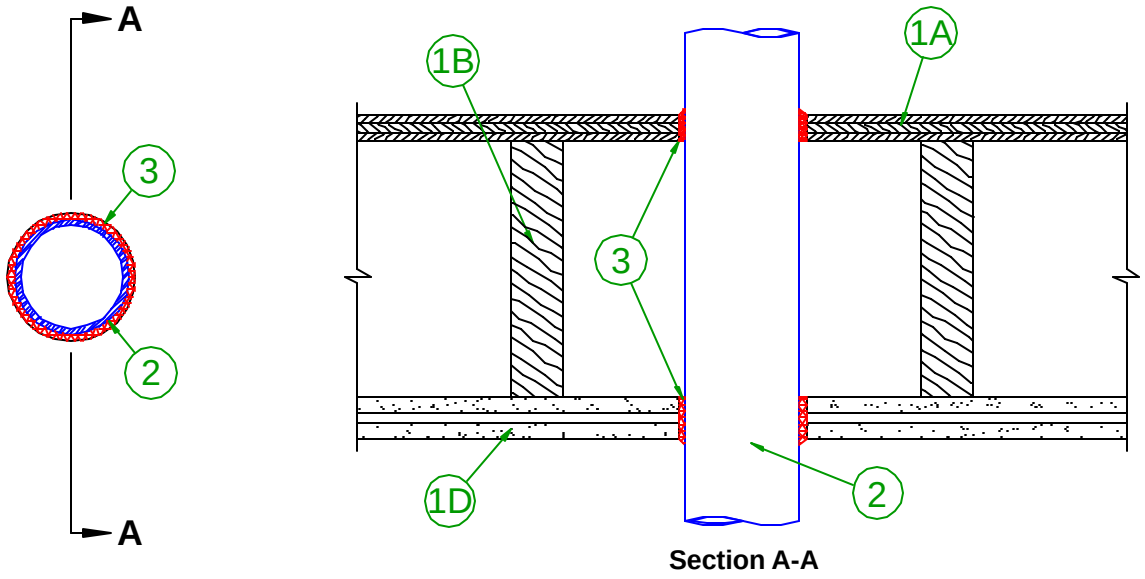


1. Concrete Floor
2A. Packing Material (Mineral Wool)
2B. Fill Material (SpecSeal 100 Sealant)

- The maximum diameter of the opening is 8”
- A minimum of 1 ½” thick mineral wool (6psf) shall be firmly packed into the opening as a permanent form and shall be recessed to accommodate the thickness of the fill material.
- A minimum of 1” thickness of fill material must be applied within the annulus, flush with both wall surfaces.

Construction	**Wood Floor/Gypsum Ceiling**
Penetrating Material	**Metal (Pipe & Conduit)**
Rating (hours)	**1,2**
Max. Pipe Size	**4”**
Ref. #	**FC1010**

Design # 14



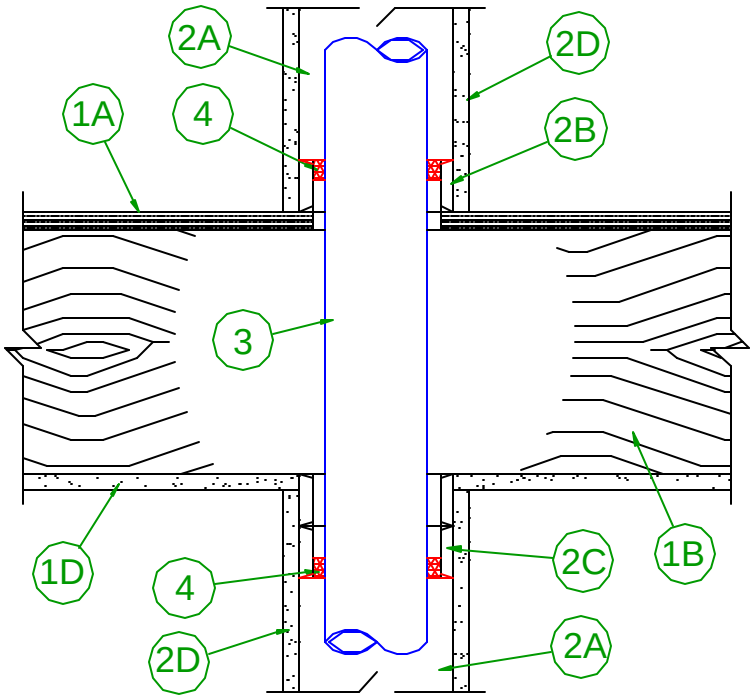
Section A-A

1A. Wood Subfloor
1B. Floor Joist
1D. Gypsum Ceiling
2. Pipe (Penetrant)
3. Fill Material (SpecSeal 100 Sealant)

- Pipe or conduit to be rigidly supported on both sides of floor.
- One metallic pipe or conduit to be installed concentrically or eccentrically within the firestopping system. The annular space between the pipe or conduit and the periphery of the opening shall be minimum of ½”.
- A minimum of ½” thickness of fill material must be applied within the annulus, flush with the top surface of the floor. A minimum of ¼” diameter bead of fill material shall be applied at the interface of the penetrant and wall at the top surface of the floor.
- Fill material shall be forced into the annulus to the maximum extent possible.
- A minimum 3/8” diameter bead of fill material shall applied at the point of contact at the top surface of the floor and the bottom surface of the gypsum board ceiling.

Construction	**Wood Floor/Gypsum Ceiling**
Penetrating Material	**Non-Metallic (Pipe & Conduit)**
Rating (hours)	**1**
Max. Pipe Size (in)	**4”**
Ref. #	**FC2102**

Design # 15

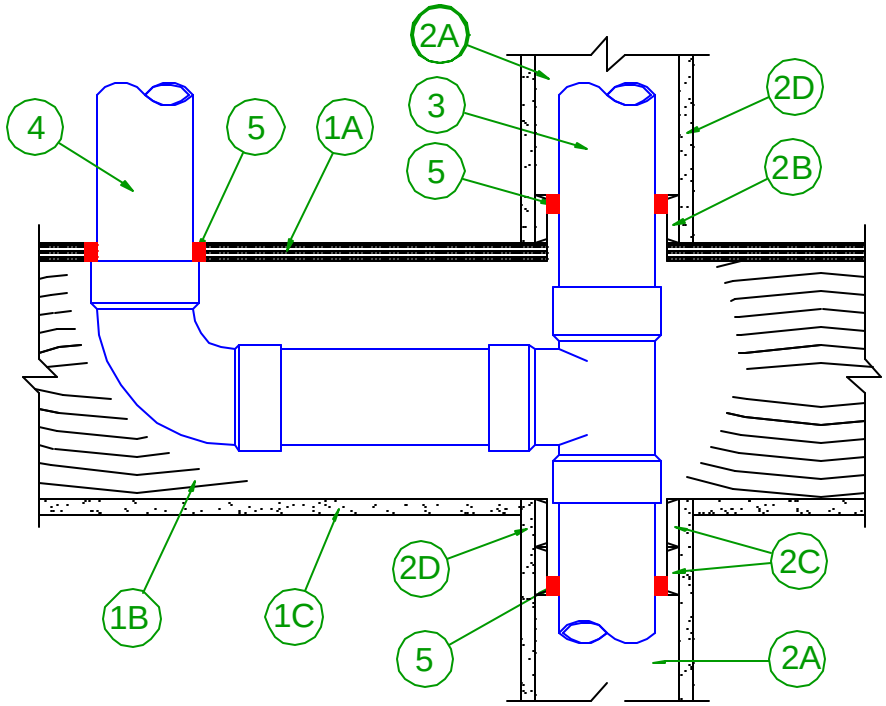


1A. Flooring System
1B. Wood Joists
1D. Gypsum Ceiling
2A. Chase Wall Stud Member
2B. Sole Plate
2C. Top Plate
2D. Gypsum Wall Board
3. Pipe (Penetrant)
1. Fill Material (SpecSeal 100 Sealant)

- Pipe or conduit to be rigidly supported on both sides of floor.
- One nonmetallic pipe or conduit to be installed concentrically or eccentrically within the firestopping system. The annular space between the pipe or conduit and the periphery of the opening shall be minimum of 1”.
- A minimum of ¾” thickness of fill material must be applied within the annulus, flush with the top surface of the sole plate for a chase wall.
- A minimum 5/8” thickness of fill material shall be applied within the annulus of the lower plate of the chase wall. Additional fill material to be installed such that a minimum ¼” bead is formed around the through penetrant on both the top and bottom surface of both plates.

Construction	**Wood Floor/Gypsum Ceiling**
Penetrating Material	**Non-Metallic (Multiple Drains)**
Rating (hours)	**1**
Max. Pipe Size (in)	**4”**
Ref. #	**FC2157**

Design # 16

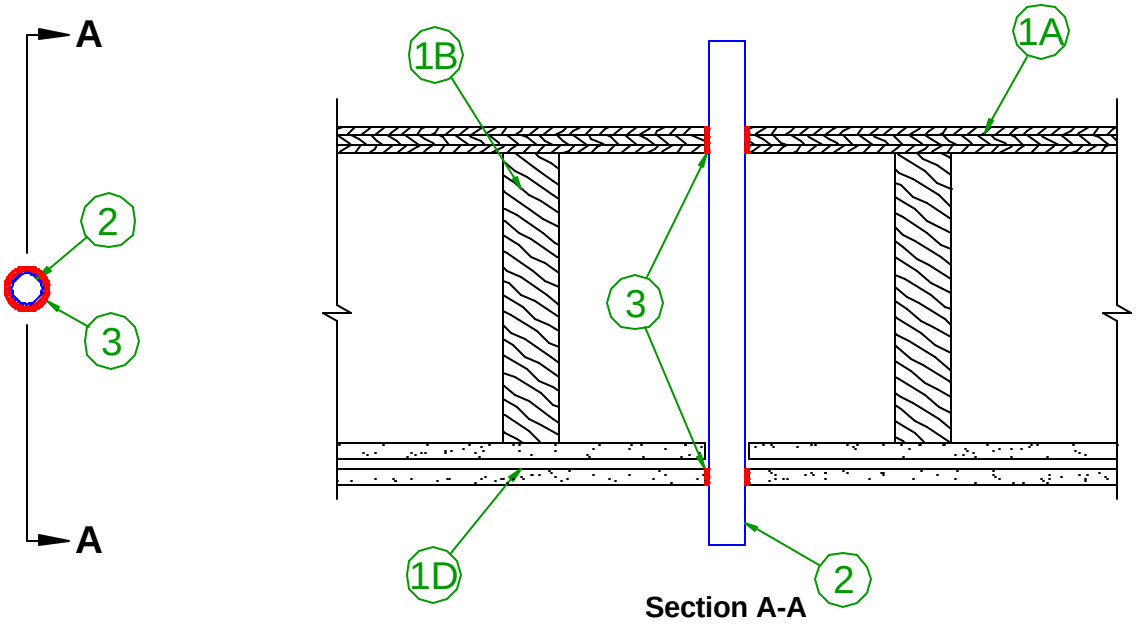


1A. Flooring System
1B. Wood Joist
1C. Gypsum Board
2A. Chase Wall Stud Members
2B. Sole Plate
2C. Top Plate
2D. Gypsum Wall Board
3. Penetrant (Pipe)
4. Branch Piping
5. Fill Material (SpecSeal 100 Sealant)

- Pipe or conduit to be rigidly supported on both sides of floor.
- One nonmetallic pipe or conduit to be installed concentrically or eccentrically within the firestopping system. The annular space between the pipe or conduit and the periphery of the opening shall be minimum of 0” (point of contact) and a maximum of ½ ”.
- A minimum of ¾” thickness of fill material must be applied within the annulus, flush with the top and bottom surface of the sole plate for a chase wall
- A minimum of ¾” thickness of fill material shall be applied to the annular space around branch piping, flush with the top surface of the floor.
- At point contact locations within the wall assembly, a minimum ½” diameter bead of fill material shall be installed at the nonmetallic pipe/wood plate interface on the top and bottom surface of the chase wall assembly.

Construction	**Wood Floor/Gypsum Ceiling**
Penetrating Material	**Cable**
Rating (hours)	**1,2**
Max. Cables Allowed	**Variable**
Ref. #	**FC3029**

Design # 17



Section A-A

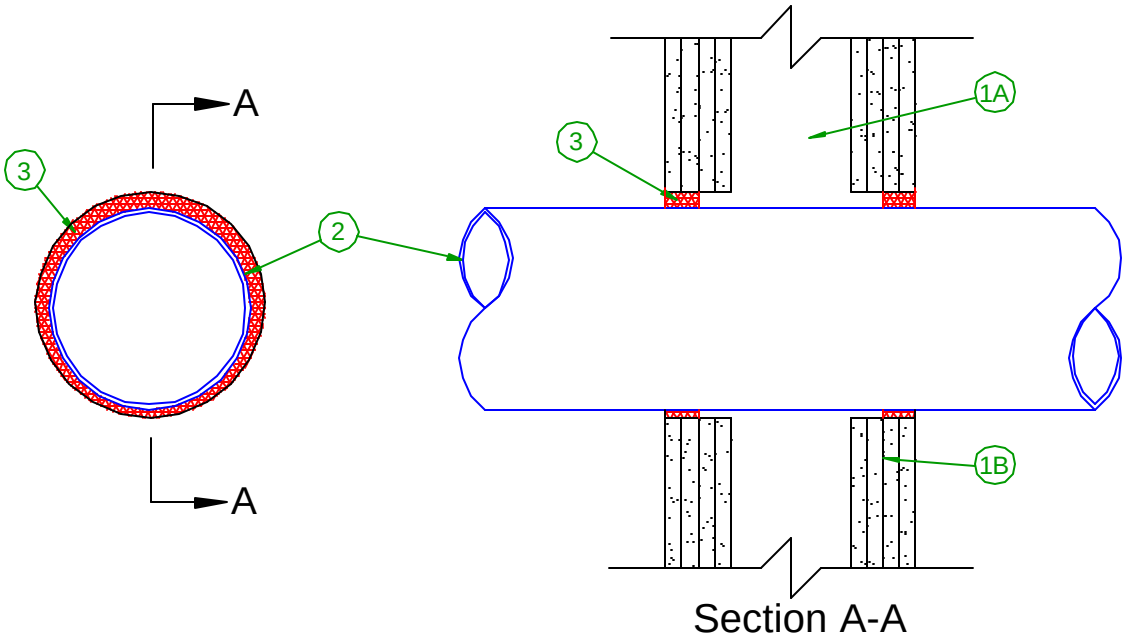
1A. Flooring System
1B. Wood Joists
2. Penetrant (Pipe)
3. Fill Material (SpecSeal 100 Sealant)

- Cable shall be rigidly supported on both sides of the floor/ceiling assembly.
- The diameter for the cable opening shall be 3/8” larger than the cable being run through the hole.
- On the top surface of the floor, a minimum thickness of 3/4" shall be applied within the annulus, flush with the top surface of the floor.
- On the bottom surface of the ceiling, a minimum 5/8” thickness of fill material shall be installed such that a minimum 1/8” crown is formed around the penetrating item.
- The chart below determines the number of cables that can be run through the penetration.

Floor Rating (Hrs.)	Type of Penetrant	Max. # of Penetrants	Rating
1	Telephone Cable	1	1
2	Telephone Cable	1	2
1	Service Entrance Cable	1	1
1	Armored Cable	1	1
1	Romex Cable	7	1
1	Metal Clad Cable	1	1

Construction	**Gypsum Wall**
Penetrating Material	**Metal (Pipe and Conduit)**
Rating (hours)	**1,2,3 and 4**
Max. Pipe Size (in)	**12" (Conduit 6")**
Ref. #	**WL1172**

Design # 18



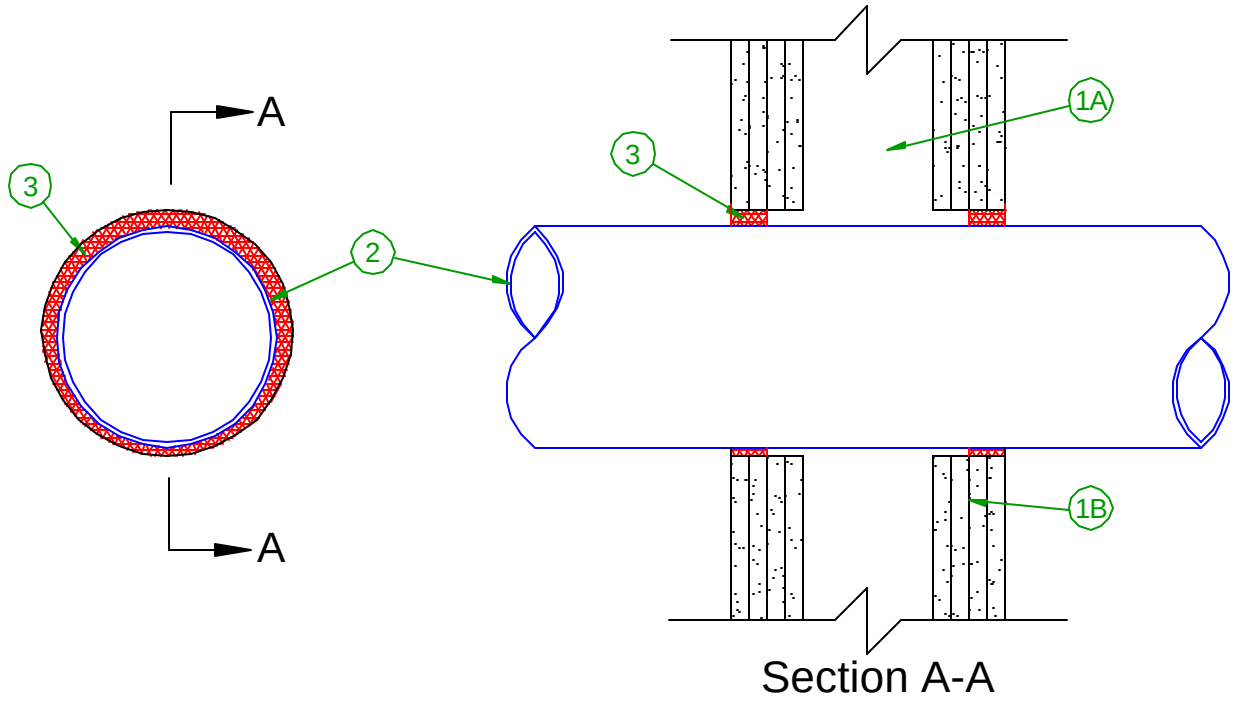
Section A-A

1A. Stud Wall Framing
1B. Multiple Layer Gypsum Board
2. Penetrant (Pipe)
3. Fill Material (SpecSeal 100 Sealant)

- Pipe or conduit to be rigidly supported on both sides of floor.
- One metallic pipe, conduit or tubing to be installed concentrically or eccentrically within the firestopping system. The annular space between the pipe or conduit and the periphery of the opening shall be minimum of ¼" and a maximum of ½ ".
- A minimum of 1" thickness of fill material shall be applied within the annulus, flush with both surfaces of the wall.

Construction	**Gypsum Wall**
Penetrating Material	**Metal (Pipe and Conduit)**
Rating (hours)	**1,2,3 and 4**
Max. Pipe Size (in)	**24”**
Ref. #	**WL1049**

Design # 19



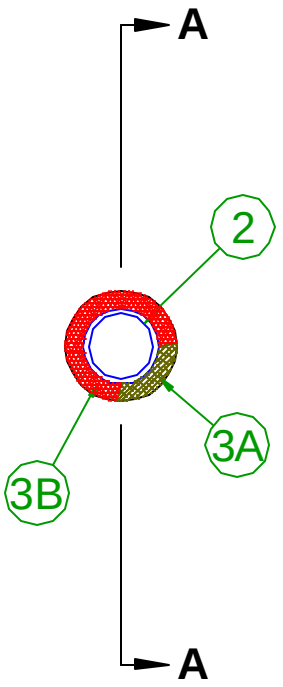
Section A-A

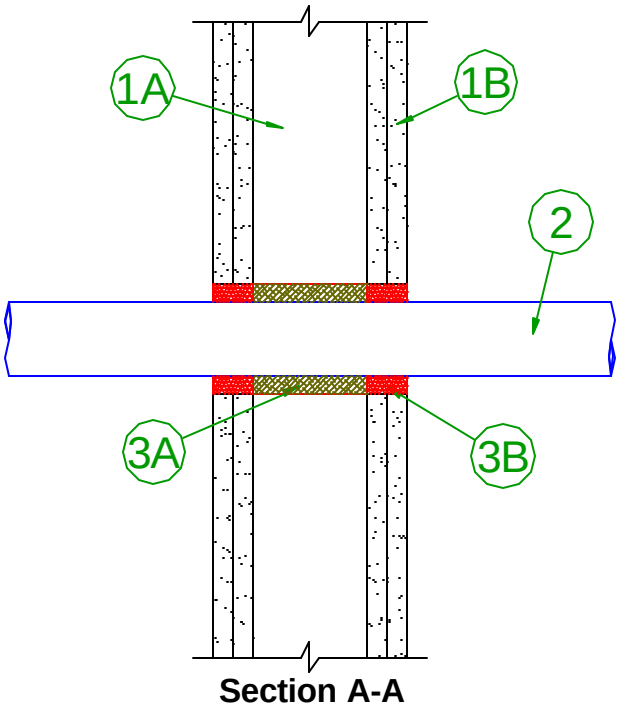
1A. Stud Wall Framing
1B. Multiple Layer Gypsum Board
2. Penetrant (Pipe)
3. Fill Material (SpecSeal 100 Sealant)

- Pipe or conduit to be rigidly supported on both sides of floor.
- One metallic pipe, conduit or tubing to be installed concentrically or eccentrically within the firestopping system. The annular space between the pipe or conduit and the periphery of the opening shall be minimum of 0” (point of contact) and a maximum of 1 ¾”.
- A minimum of 5/8” thickness of fill material shall be applied within the annulus, flush with both surfaces of the wall.
- At the point contact location (if applicable), a minimimum 3/8” diameter bead of fill material shall be applied at the gypsum wallboard/through penetrant interface on both surfaces of the wall.

Construction	**Gypsum Wall**
Penetrating Material	**Non-Metallic (Pipe and Conduit)**
Rating (hours)	**1,2,**
Max. Pipe Size (in)	**2”**
Ref. #	**WL2047**

Design # 20





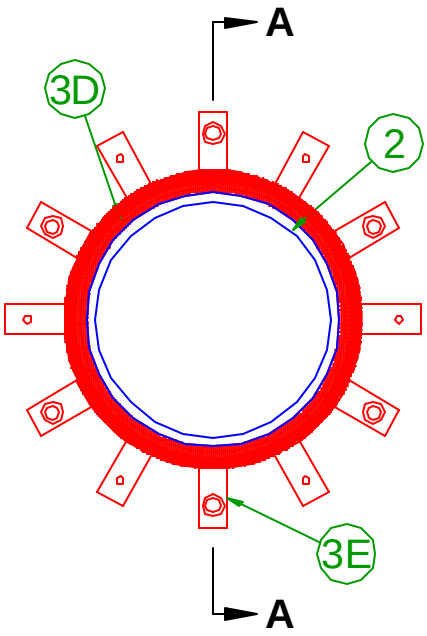
Section A-A

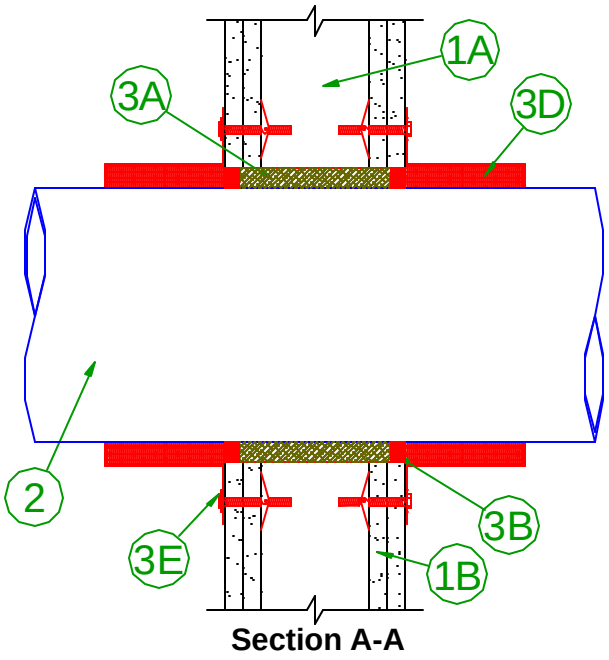
1. Stud Wall Framing
1B. Multiple Layer Gypsum Board
2. Penetrant (Pipe)
3A. Packing Material (Fiberglass Insulation)
3B. Fill Material (SpecSeal 100 Sealant)

- Pipe or conduit to be rigidly supported on both sides of floor.
- One non-metallic pipe, conduit or tubing to be installed concentrically or eccentrically within the firestopping system. The annular space between the pipe or conduit and the periphery of the opening shall be minimum of 0” (point of contact) and a maximum of 9/16”.
- A minimum 2 ½” thickness of 3.5 pcf fiberglass insulation shall be wrapped around the penetrating item and secured by means of a No.24AWG steel wire. The packing material shall be recessed to accommodate the thickness of the required fill material.
- A minimum of 1 1/4” thickness of fill material shall be applied within the annulus, flush with both surfaces of the wall.

Construction	**Gypsum Wall**
Penetrating Material	**Non-Metallic (Pipe and Conduit)**
Rating (hours)	**1,2**
Max. Pipe Size (in)	**8”**
Ref. #	**WL2079**

Design # 21





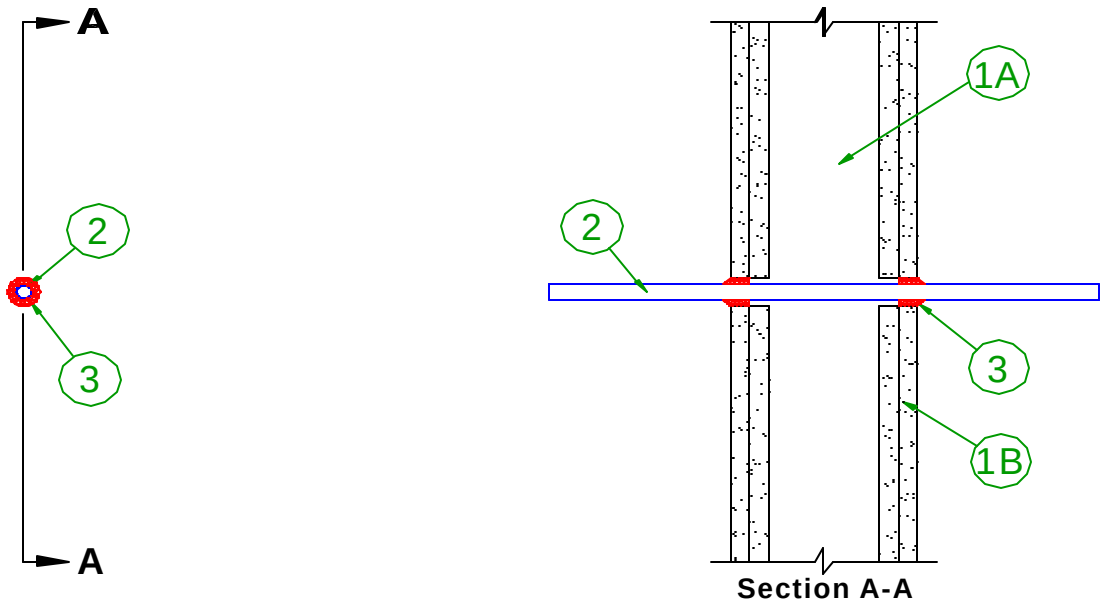
Section A-A

1. Stud Wall Framing
1B. Multiple Layer Gypsum Board
2. Penetrant (Pipe)
3A. Packing Material (Mineral Wool)
3B. Fill Material (SpecSeal 100 Sealant)
3D. Wrap Strip (Two Stacks, SpecSeal BLU Wrap Strip)
3E. Steel Collar

- Pipe or conduit to be rigidly supported on both sides of floor.
- One non-metallic pipe, conduit or tubing to be installed concentrically or eccentrically within the firestopping system. The annular space between the pipe or conduit and the periphery of the opening shall be minimum of 0” (point of contact) and a maximum of 11/16”.
- A minimum of 4pcf fiberglass insulation shall be wrapped around the penetrating item and secured by means of a No.24AWG steel wire. The packing material shall be recessed to accommodate the thickness of the required fill material.
- Pressure sensitive aluminum foil tape shall be wrapped around the outer circumference of the through penetrant with a 1” wide overlap along the perimeter joint.
- A minimum of 1/2” thickness of fill material shall be applied within the annulus, flush with both surfaces of the wall.
- The steel collar shall be tightened around the wrap strips and penetrant with a ½” wide stainless steel hose clamp placed 2” on center.
- The collar shall be secured to the wall with 1/8” diameter by 1 ¾” long steel molly bolts in conjunction with a minimum ¼” by 1 ¼” diameter steel fender washers.

Construction	**Gypsum Wall**
Penetrating Material	**Cable**
Rating (hours)	**1,2**
Max. Hole Size	**6”**
Ref. #	**WL3090**

Design # 22



Section A-A

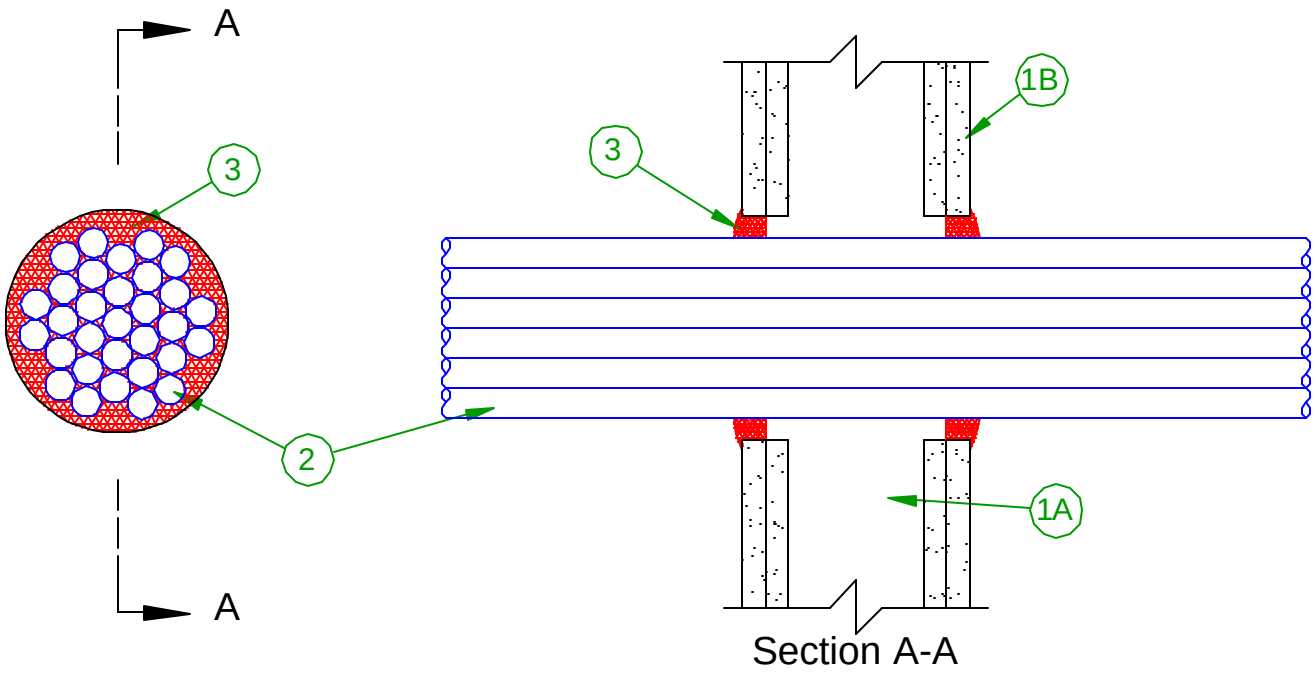
1A. Wall Studs (Wood)
1B. Gypsum Wall Board
2. Through Penetration (Cable)
3. Fill Material (SpecSeal 100 Sealant)

- The cable shall be rigidly supported on both sides of the assembly.
- The thickness of the fill material and the thickness of the crown shall be determined by the chart below.

Rating of Wall	Type of Through Penetrant	Thickness of Fill Material (Inches)	Thickness of Fill Material Crown (Inches)
1 & 2	Telephone Cable	5/8	1/4
1	Romex Cable	5/8	3/8
2	Romex Cable	3/4	1/4
1 & 2	Service cable	5/8	1/4
1 & 2	Armored Cable	5/8	1/4
1 & 2	Metal Clad Cable	5/8	1/4

Construction	**Gypsum Wall**
Penetrating Material	**Cable(s)**
Rating (hours)	**1,2**
Max. Hole Size	**4”**
Ref. #	**WL3076**

Design # 23



1A. Wall Studs (Wood)
1B. Gypsum Wall Board
2. Through Penetration (Cables)
3. Fill Material (SpecSeal 100 Sealant)

- The maximum diameter for the bundle of cables is 4”.
- The annular space minimum shall be 0” (point of contact) and a maximum of 1/2" larger than the diameter of the cable bundle.
- A minimum 5/8” thickness of fill material shall be applied within the annulus flush with both surfaces of the wall.
- Fill material shall be forced in between the cables group as much as possible.
- A minimum of 1/4" diameter bead of fill material shall be applied at the interface of both walls.

Section C:

Appendix A (Reference) - UL System Files

Print