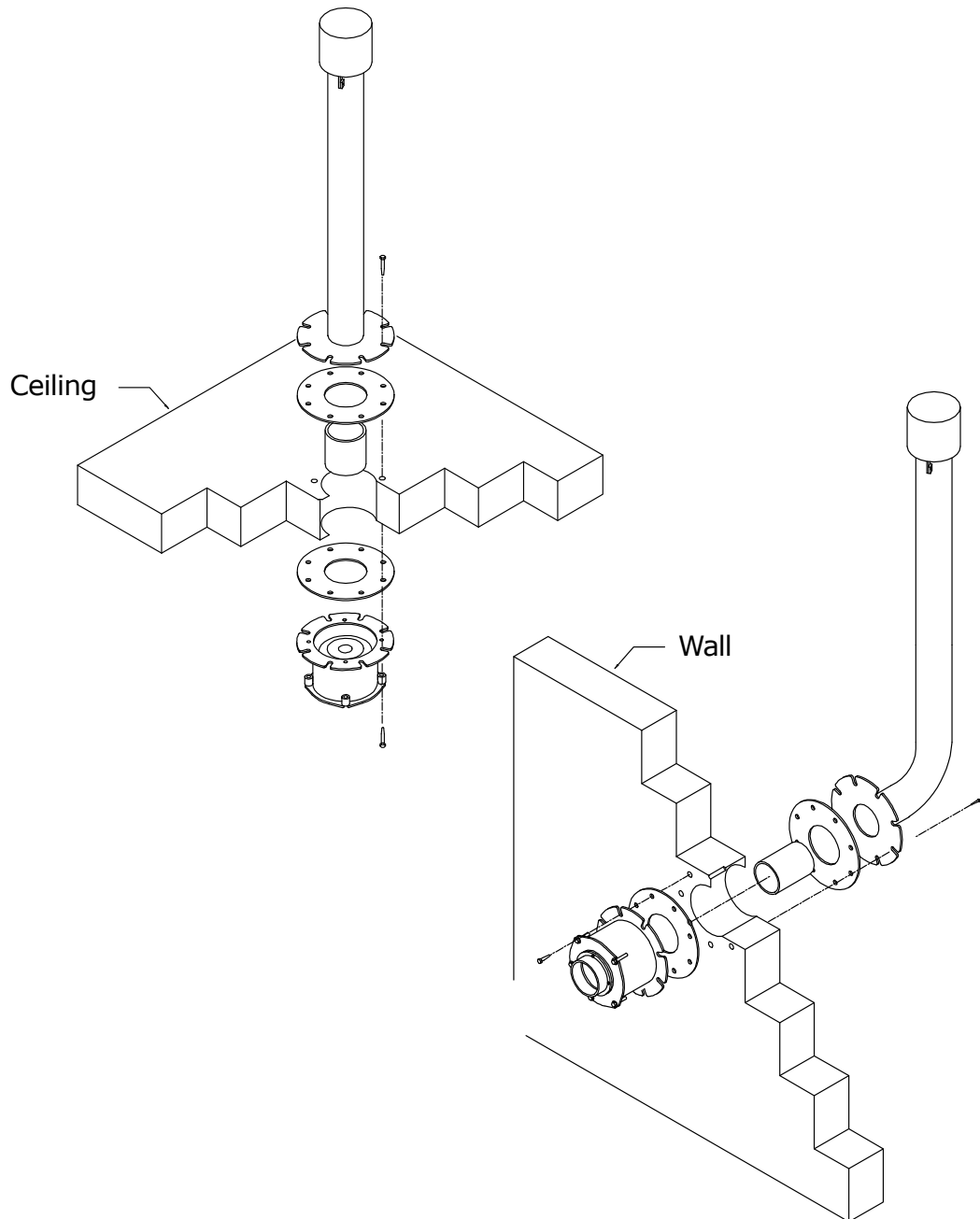


American Safe Room

Blast Resistant Ventilation Pipes Technical Manual

for use in underground blast shelters



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Description

The American Safe Room blast resistant steel ventilation pipe kit is designed for use in hardened underground blast shelters. They feature an impact resistant removable cover that functions as a rain hood and a removable, cleanable insect screen that also functions as a gross pre-filter.

No cutting, fitting, or welding is required. For ease of assembly these pipes are designed as bolt on kit system and will fit and function with all American Safe Room filtration systems and hardware such as the Safe Cell NBC air filter, the ASR-101-BV Blast valve, and the ASR-50 Overpressure valve.

American Safe Room shelter ventilation pipes are constructed from ASTM A500 grade A steel and ASTM A53 grade B schedule 40 pipe with a 4½-inch OD (outer diameter) and a 4-inch ID (inner diameter) which has a tensile strength of 45,000 pounds per square inch.

There are two styles to choose from: style A - the ceiling mount for through the roof penetrations and style B - the wall mount for through the wall penetrations.

Style A (ceiling mount) normally bolts the ventilation pipe mounting flange directly to the bottom form board of the roof of the shelter - before the concrete is poured. As an option, you can pour a wall sleeve in place, then bolt the ventilation pipe over the wall sleeve, directly to the top of the shelter roof after the concrete has cured. Style B (wall mount) utilizes a wall sleeve that is mounted between the wall form boards prior to pouring the concrete and the ventilation pipe bolts directly over this wall sleeve with concrete wedge anchors - after the concrete is poured and cured.

After the order form on page 10 is filled out and returned to American Safe Room, a formal quotation will be sent detailing price and availability of your ventilation pipes.

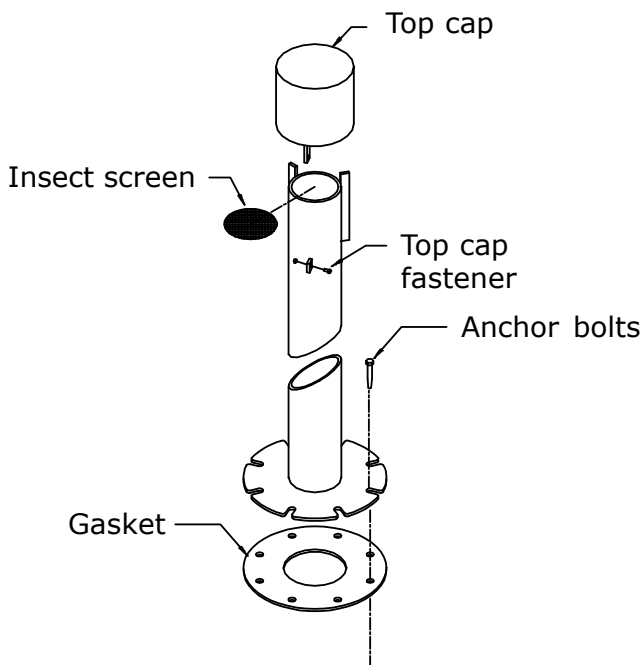


Figure 1
Style A
Ceiling Installation

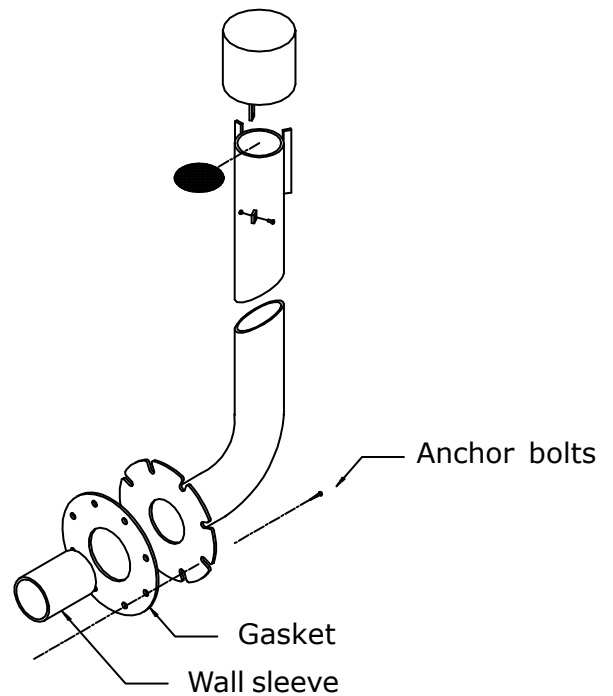


Figure 2
Style B
Wall Installation

Style A-F ceiling Installation - flat form board

For concrete shelters with flat form boards

Note: this part list is for one ventilation pipe. Two ventilation pipes are required for each shelter - an air intake and an air outflow pipe.

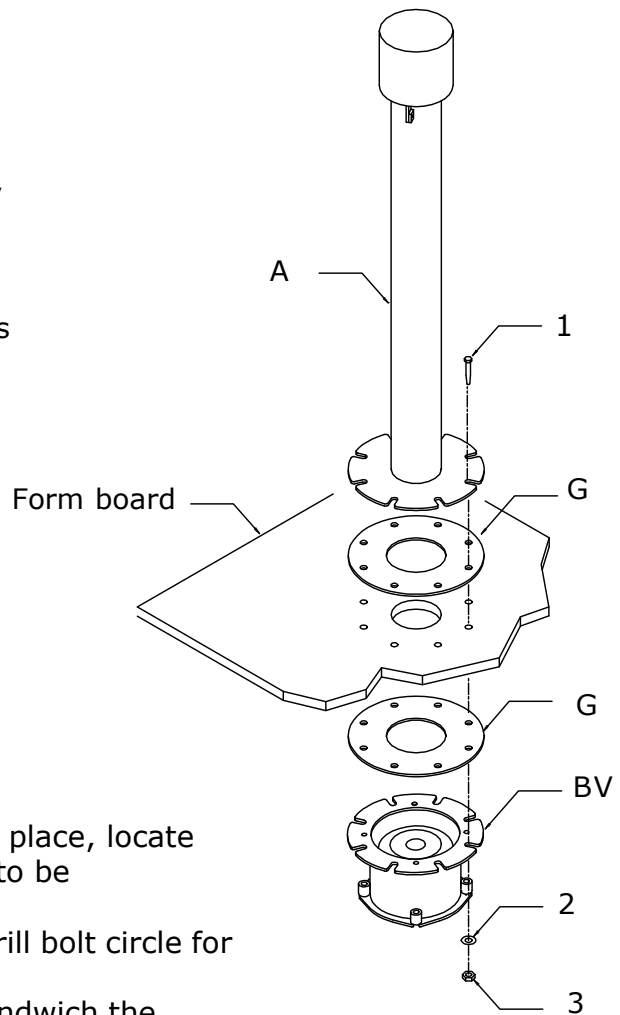
Included with this installation

- A 1 each ceiling style ventilation pipe
- G 1 each rubber gasket
- 1 8 each HHCS $\frac{1}{2}$ "-13 x 3"
- 2 16 each flat washer $\frac{1}{2}$ "
- 3 8 each hex nut $\frac{1}{2}$ "-13

Optional components - must be ordered separately

- BV 1 each blast valve, with gasket
- S 1 each concrete sleeve kit, see page 7

Note: this installation can also be used for steel shelters with flat ceilings.



Installation steps:

1. After the bottom form board of the ceiling is in place, locate and cut a 4½ inch hole where the vent pipe is to be mounted.
2. Using the blast valve as template, locate and drill bolt circle for valve, ½ inch holes in all 8 locations.
3. Using the 8 each ½ inch X 3-in length bolts, sandwich the assembly together as shown in figure 6.
4. Pour the concrete.

Figure 6

Style A-C Ceiling installation for corrugated form

For concrete shelters with corrugated form boards

Note: this part list is for one ventilation pipe. Two ventilation pipes are required for each shelter - an air intake and an air outflow pipe.

Included with this installation

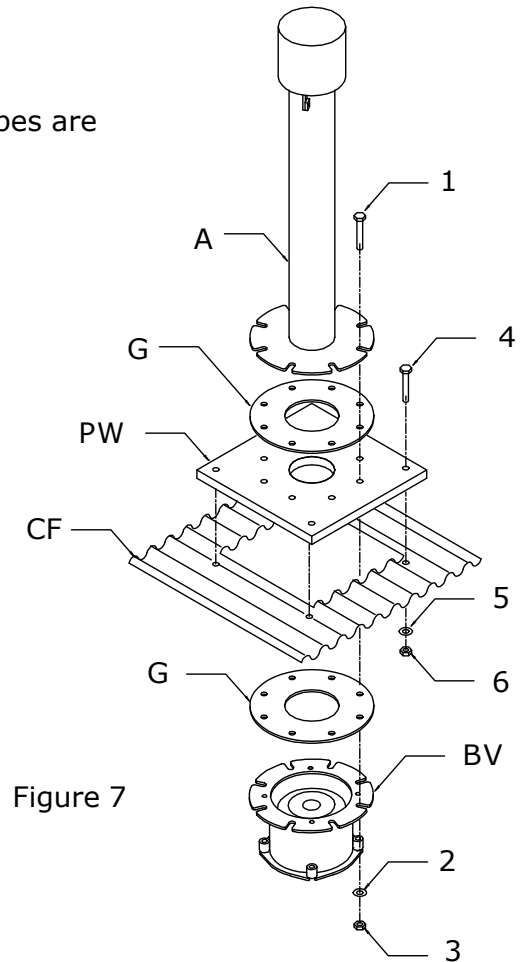
A	1 each	ceiling style ventilation pipe
G	1 each	rubber gasket
1.	8 each	HHCS 1/2"-13 x 3"
2.	16 each	flat washer 1/2"
3.	8 each	hex nut 1/2"-13
4.	4 each	HHCS 1/2"-13 X 2"
5.	8 each	flat washer, 1/2"
6.	4 each	hex nuts 1/2"-13

Optional components - must be ordered separately

BV	1 each	blast valve, with gasket
S	1 each	concrete sleeve kit, see page 7

Components not provided

P/W	1 each	3/4" plywood filler board
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Installation steps:

1. Cut 13 inch square hole in corrugated sheet.
2. Cut out 17 inch square from 1-in plywood.
3. Cut 4 1/2 inch hole in center of plywood.
4. Using valve as template drill bolt circle for valve, 1/2 inch holes in all 8 locations.
5. Drill corners of plywood for 1/2 inch by 2 inch bolts.
6. Center plywood over cut hole in corrugated sheet and transfer drill the carriage bolt holes in corrugated sheet.
7. Using the 4 each 1/2 inch x 2-in bolts sandwich the plywood to the corrugated sheet.
8. Using the 8 each 1/2 inch X 3-in length bolts, sandwich the assembly together as shown in figure 7.
9. Use duct tape or corrugated support boards (wavy boards) to close off the gaps between the plywood and the valleys of the sheet.
10. Pour the concrete.

Style B Wall Installation

Note: this part list is for one ventilation pipe. Two ventilation pipes are required for each shelter - an air intake and an air outflow pipe.

This installation can be done without the sleeve kit, but a 4½ inch hole must be bored through the wall. The vent pipe is mounted on the outside of the shelter and the blast valve is mounted inside the shelter using concrete wedge anchors.

See page 8 for complete installation instructions using the sleeve kit.

Included with this installation

B	1 each	wall style ventilation pipe
G	1 each	rubber gasket
L	8 each	concrete wedge anchors

Optional components - must be ordered separately

BV	1 each	blast valve, with gasket
S	1 each	concrete sleeve kit, see page 8

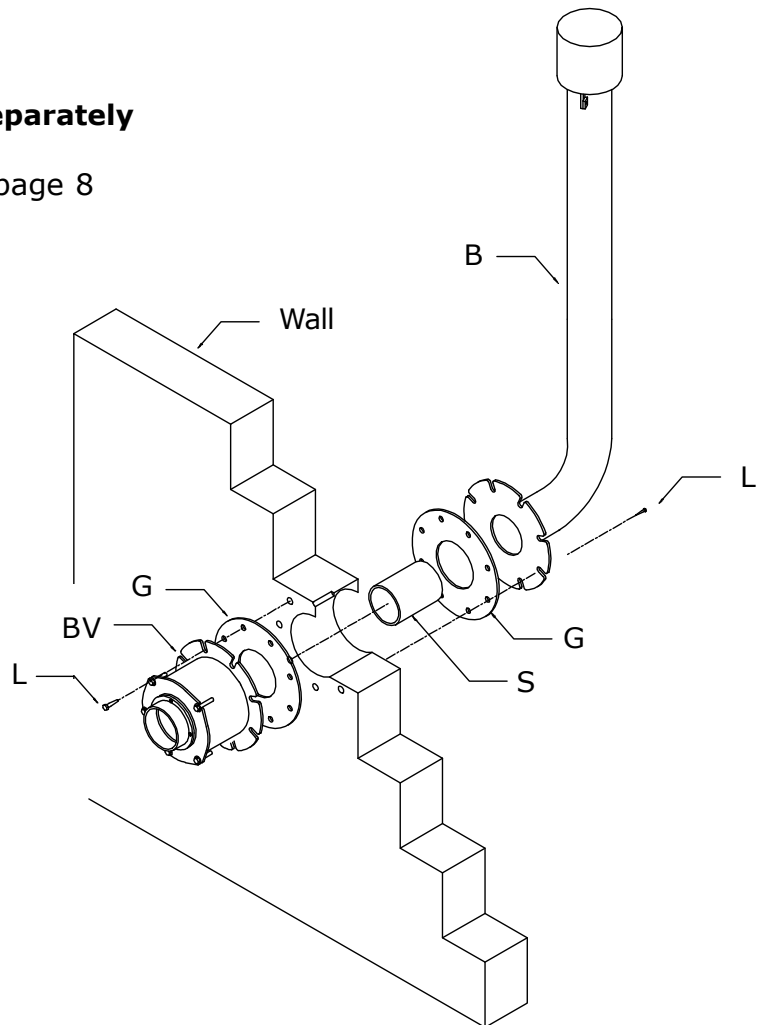


Figure 8

Optional Sleeve Kit – ceiling installation

When the concrete form may not be assembled as shown in figures 6 and 7, then the sleeve kit may be employed. This kit allows you to pour the concrete first, then install the vent pipes using concrete wedge anchors - which are included along with the masonry drill bit. See page 8 for using this kit in a wall installation.

Note: this part list is for one sleeve kit. Two ventilation pipes are required for each shelter - an air intake and an air outflow pipe.

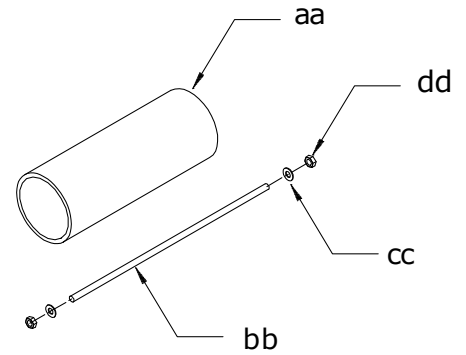


Figure 9

Included with this installation - figure 9

- aa 1 each 4½ inch OD ABS ¼ inch wall plastic tube
12 inches long
- bb 1 each ¾-16 threaded rod, 16 inches long
- cc 2 each ¾ inch hex nuts
- dd 2 each ¾ inch flat washers
- 8 each concrete wedge anchors - not shown
- 1 each masonry drill bit - not shown

level of poured concrete

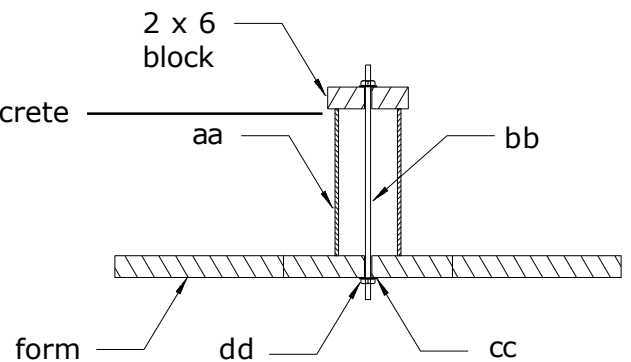


Figure 10
Ceiling installation

Ceiling installation instructions - figure 10

1. Locate and drill a ¾th inch hole at desired location in form.
2. Cut plastic wall tube (aa) to required length fit thickness of pour.
3. Make center drilled top cap from 2" X 6" board.
4. Sandwich plastic sleeve between top cap and form and install fasteners (cc) and (dd) as shown in figure 10.
5. Pour concrete and let it cure.
6. Using the gasket as a guide, locate and drill 8 holes for concrete wedge anchors.
7. Install anchors as per the instructions on page 11.

Note: flange plate clearance

The penetration location must have a minimum clearance of a 6¼-inch radius about the center point of the sleeve. This is required in order to create an unobstructed seat area for the 12½-in flange of both the ventilation pipe and the blast valve. Do not locate the wall sleeve too close to the wall. See figure 11.

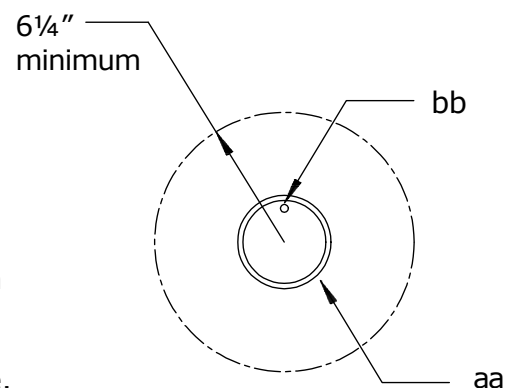


Figure 11
Flange plate clearance

Optional Sleeve Kit – wall installation

When the concrete form may not be assembled as shown in figures 6 and 7, then the sleeve kit may be employed. This kit allows you to pour the concrete first, then install the vent pipes using concrete wedge anchors - which are included along with the masonry drill bit. See page 7 for using this kit in a ceiling installation

Note: this part list is for one sleeve kit. Two ventilation pipes are required for each shelter - an air intake and an air outflow pipe.

Wall installation instructions - figure 12

1. With one form side completed and then other side up to the elevation of the sleeve (aa) penetration, this is in order to allow working room.
2. Drill a $\frac{3}{8}$ inch hole aligned through both the inner and outer form.
3. Cut plastic wall tube (aa) to needed length fit between forms.
4. Position the plastic wall tube (aa) and insert threaded rod (bb) and sandwich tight with nuts and washers (cc) and (dd).
5. Pour concrete and let it cure.
6. Using the gasket as a guide, locate and drill 8 holes for concrete wedge anchors.
7. Install anchors as per the instructions on page 11.

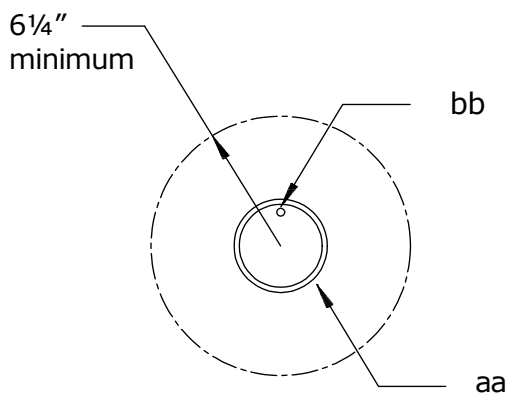


Figure 11
Flange plate clearance

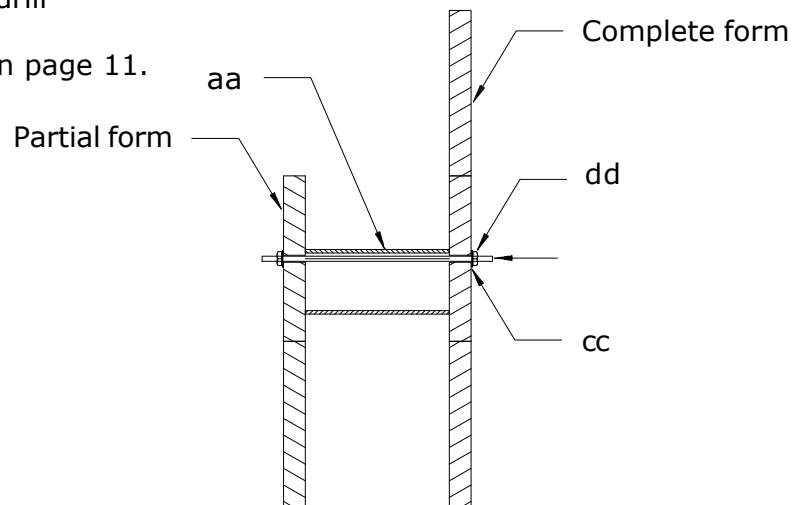


Figure 12
Wall installation

Note: flange plate clearance

The penetration location must have a minimum clearance of a 6.1/4-inch radius about the center point of the sleeve. This is required in order to create an unobstructed seat area for the 12.1/2-in flange of both the ventilation pipe and the blast valve. Do not locate the wall sleeve too close to the ceiling or floor. See figure 11.

Ordering Information

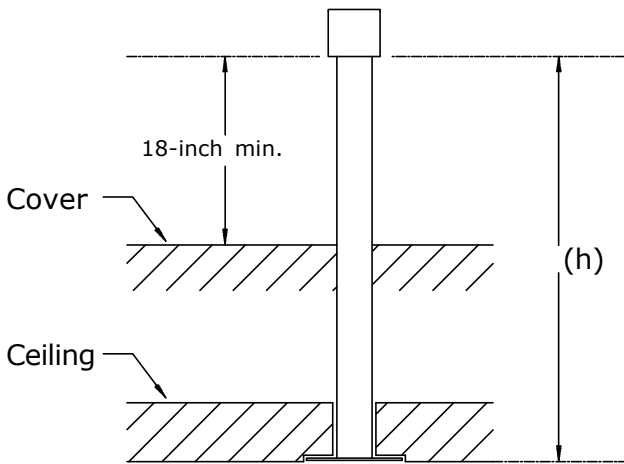


Figure 13
 Style A-F: ceiling penetration
 for flat form board

Style A-C: ceiling penetration
 for corrugated form board

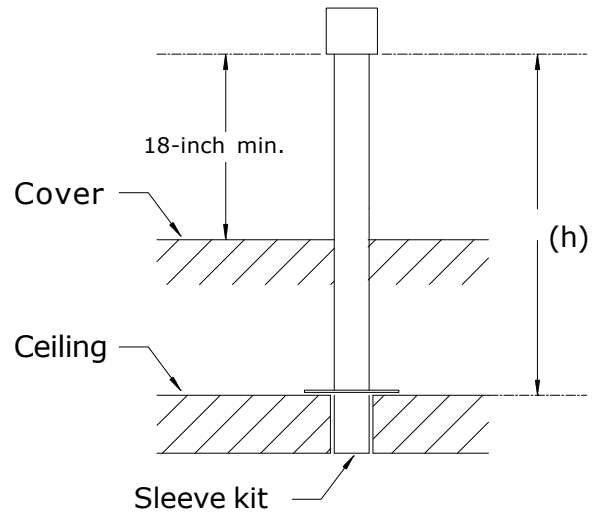


Figure 14
 Style A - ceiling penetration
 Sleeve kit required

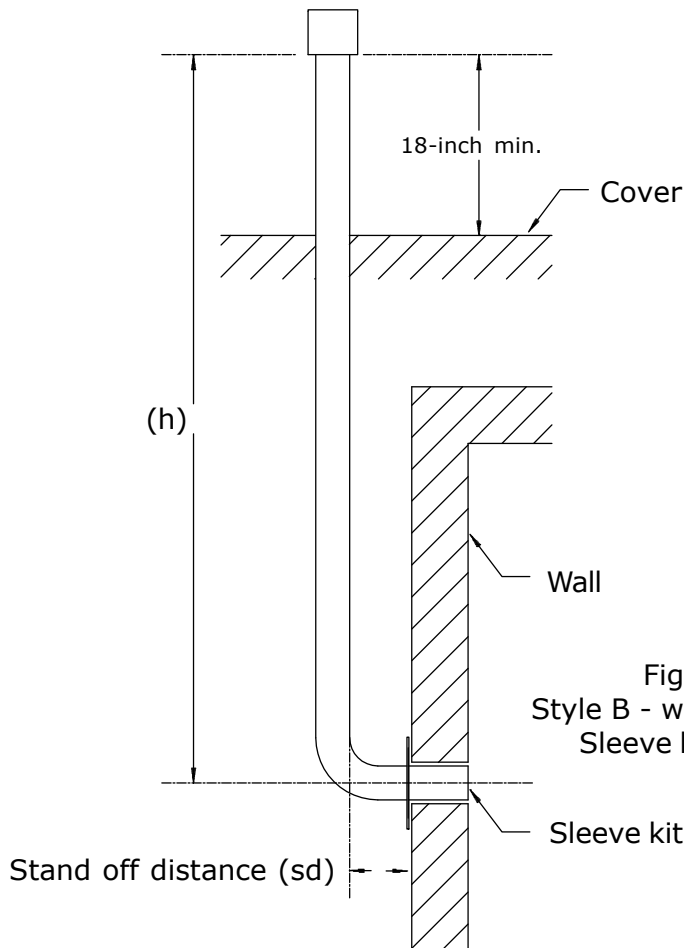


Figure 15
 Style B - wall penetration
 Sleeve kit required

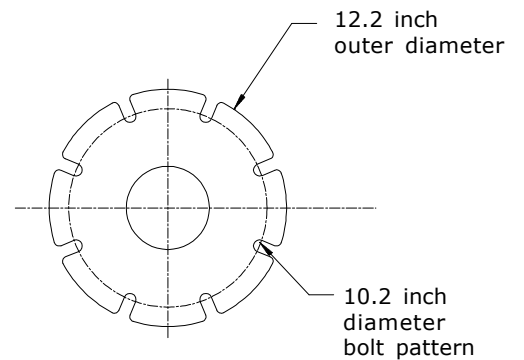


Figure 16
 Ventilation pipe and blast
 valve mounting flange
 dimensions

Blast resistant ventilation duct order form

American Safe Room
868 Murdock Drive
Oakland, OR 97462
Telephone: 541-459-1806
FAX: 503-212-6695
Website: www.AmericanBombShelter.com
E-mail: sales@mailasr.com

Name: _____

Telephone: _____ FAX: _____ E-mail: _____

Billing address: _____

Shipping address: _____

Note: stand off distance (sd) only applicable to Style B pipes.

Air intake pipe:

Style: _____ Sleeve kit (Y/N): _____ Quantity: _____

Dimensions: h: _____ sd: _____

Air outflow pipe:

Style: _____ Sleeve kit (Y/N): _____ Quantity: _____

Dimensions: h: _____ sd: _____

Notes: _____

Concrete Wedge Anchor - Technical Information

The ThunderStud® wedge anchor consists of two pieces, permanently pre-assembled into a single unit. The carbon steel rod is threaded for a portion of its length. The extreme end of the threaded portion is rounded to protect the threads from damage while the anchor is being driven into the hole drilled in the concrete. The other end of the rod has a necked down diameter, which runs for a short distance, at the end of which it tapers outwardly to the full diameter of the rod. A precision formed universal clip made of carbon steel is permanently assembled around the necked down diameter to complete the anchor. Each package contains the correct number of nuts and washers.

Concrete Wedge Anchor - Approvals:

Listed by Underwriters Laboratories (UL), International Conference of Building Officials (ICBO) carbon steel only, Board of Standards and Appeals (BSA), City of L.A. Meets or exceeds U.S. Government G.S.A. Specifications FF-S-325 Group 11, Type 4, Class

Concrete Wedge Anchor - Applications:

Medium to heavy duty into concrete.

Concrete Wedge Anchor - Installation:

(1) Drill hole into concrete with a carbide tipped masonry drill bit conforming to ANSI B94, 12-77, the same size as the ThunderStud® wedge anchor. If the fixture being fastened is in place and being used as a template to locate the ThunderStud® anchor, the mounting hole in the fixture should afford clearance for the universal wedge clip on the stud. (2) Clean hole, place the ThunderStud® wedge anchor through the hole in the fixture or directly into the concrete and hammer it in to the drilled hole until the threads are below the surface of the fixture/concrete. (3) Turn the nut by hand until the unit is snugged up. Tighten the nut with a wrench, approximately three or four full turns, to complete the fastening.

Concrete Wedge Anchor - Anchor Length:

Minimum embedment, plus fixture, plus nut and washer. The ThunderStud® wedge anchor requires no maximum hole depth. The depth of the hole in the concrete should be the length of the wedge anchor minus the thickness of the material being fastened. This will result in some extra depth to accommodate a minor amount of concrete cutting which may not be able to be cleaned out of hole.