

VaporBlock® Plus™

UNDERSLAB VAPOR RETARDER / GAS BARRIER

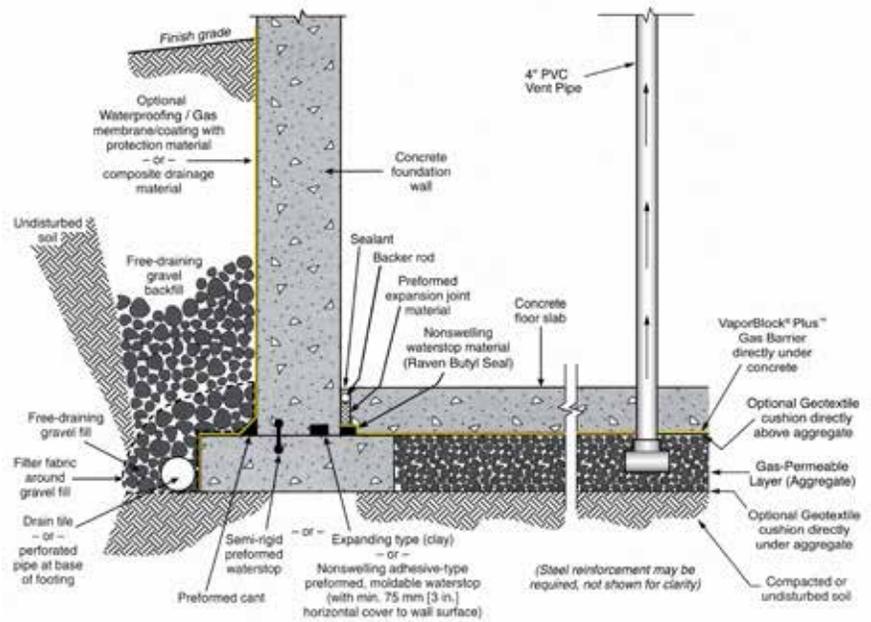
INSTALLATION GUIDELINES - With VaporSeal™ Tape

Please Note: Read these instructions thoroughly before installation to ensure proper use of VaporBlock® Plus™. ASTM E 1465, ASTM E 2121 and, ASTM E 1643 also provide valuable information regarding the installation of vapor / gas barriers. When installing this product, contractors shall conform to all applicable local, state and federal regulations and laws pertaining to residential and commercial building construction.

- When VaporBlock® Plus™ gas barrier is used as part of an active control system for radon or other gas, a ventilation system will be required.
- If designed as a passive system, it is recommended to install a ventilation system that could be converted to an active system if needed.

Materials List:

- VaporBlock® Plus™ Vapor / Gas Barrier
- VaporSeal™* 4" Seaming Tape
- VaporSeal™* 12" Seaming/Repair Tape
- Butyl Seal 2-Sided Tape
- VaporBoot Plus Pipe Boots 12/Box (recommended)
- VaporBoot Tape (optional)
- POUR-N-SEAL™ (optional)
- 1" Foam Weather Stripping (optional)
- Mako® Screed Supports (optional)



Elements of a moisture/gas-resistant floor system. General illustration only.
(Note: This example shows multiple options for waterstop placement.)

VAPORBLOCK® PLUS™ PLACEMENT

- 1.1. Level and tamp or roll granular base as specified. A base for a gas-reduction system may require a 4" to 6" gas permeable layer of clean coarse aggregate as specified by your architectural or structural drawings after installation of the recommended gas collection system. In this situation, a cushion layer consisting of a non-woven geotextile fabric placed directly under VaporBlock® Plus™ will help protect the barrier from damage due to possible sharp coarse aggregate.
- 1.2. Unroll VaporBlock® Plus™ running the longest dimension parallel with the direction of the pour and pull open all folds to full width. (Fig. 1)
- 1.3. Lap VaporBlock® Plus™ over the footings and seal with Raven Butyl Seal tape at the footing-wall connection. Prime concrete surfaces, when necessary, and assure they are dry and clean prior to applying Raven Butyl Seal Tape. Apply even and firm pressure with a rubber roller. Overlap joints a minimum of 6" and seal overlap with 4" VaporSeal™ Tape. When used as a gas barrier, overlap joints a minimum of 12" and seal in-between overlap with an optional 2-sided Raven Butyl Seal Tape. Then seal with 4" VaporSeal™ Tape centered on the overlap seam. (Fig. 2)



Fig. 1: VaporBlock® Plus™ Overlapping Roll-out Method



Fig. 2: VaporBlock® Plus™ Overlap Joint Sealing Methods

Top original diagram and figure #1 were reprinted with permission by the Portland Cement Association. Reference: Kanare, Howard M., Concrete Floors and Moisture, EB119, Portland Cement Association, Skokie, Illinois, and National Ready Mixed Concrete Association, Silver Spring, Maryland, USA, 2008, 176 pages.

SINGLE PENETRATION PIPE BOOT INSTALLATION

1.4. Seal around all plumbing, conduit, support columns or other penetrations that come through the VaporBlock® Plus™ membrane.

1.4a. **Method 1:** Pipes four inches or smaller can be sealed with Raven VaporBoot Plus preformed pipe boots. VaporBoot Plus preformed pipe boots are formed in steps for 1", 2", 3" and 4" PVC pipe or IPS size and are sold in units of 12 per box (Fig. 3 & 5).

Pipe boots may also be fabricated from excess VaporBlock® Plus™ membrane (Fig. 4 & 6) and sealed with VaporBoot Tape or VaporSeal™ Tape (sold separately).

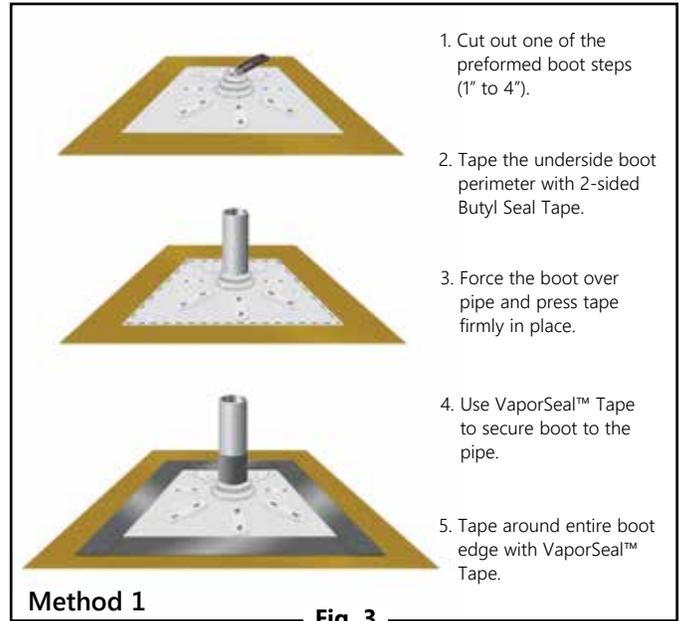
1.4b. **Method 2:** To fabricate pipe boots from VaporBlock® Plus™ excess material (see Fig. 4 & 6 for A-F):

- A) Cut a square large enough to overlap 12" in all directions.
- B) Mark where to cut opening on the center of the square and cut four to eight slices about 3/8" less than the diameter of the pipe.
- C) Force the square over the pipe leaving the tightly stretched cut area around the bottom of the pipe with approximately a 1/2" of the boot material running vertically up the pipe. (no more than a 1/2" of stretched boot material is recommended)
- D) Once boot is positioned, seal the perimeter to the membrane by applying 2-sided Raven Butyl Seal Tape in between the two layers. Secure boot down firmly over the membrane taking care not to have any large folds or creases.
- E) Use VaporBoot Tape or VaporSeal™ Tape to secure the boot to the pipe.

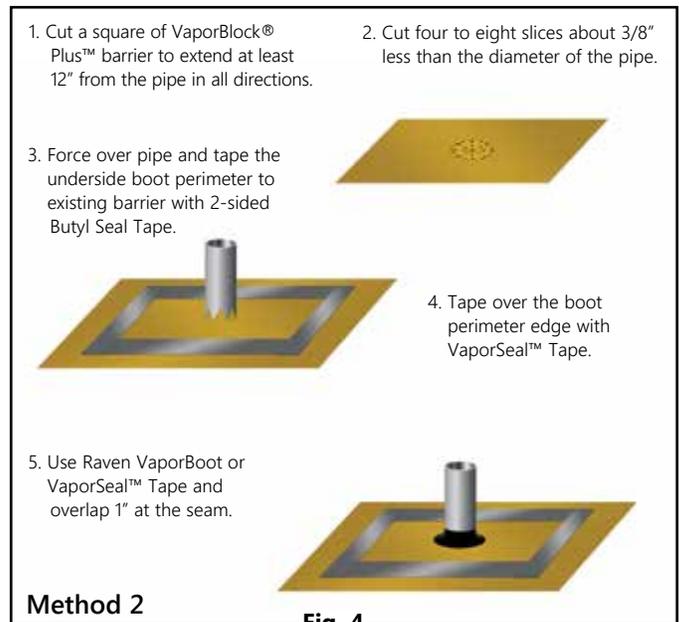
VaporBoot Tape (option) – fold tape in half lengthwise, remove half of the release liner and wrap around the pipe allowing 1" extra for overlap sealing. Peel off the second half of the release liner and work the tape outward gradually forming a complete seal.

VaporSeal™ Tape (option) - Tape completely around pipe overlapping the VaporBlock® Plus™ square to create a tight seal against the pipe.

F) Complete the process by taping over the boot perimeter edge with VaporSeal™ Tape to create a monolithic membrane between the surface of the slab and gas/moisture sources below and at the slab perimeter. (Fig. 4 & 6)



Method 1 **Fig. 3**



Method 2 **Fig. 4**

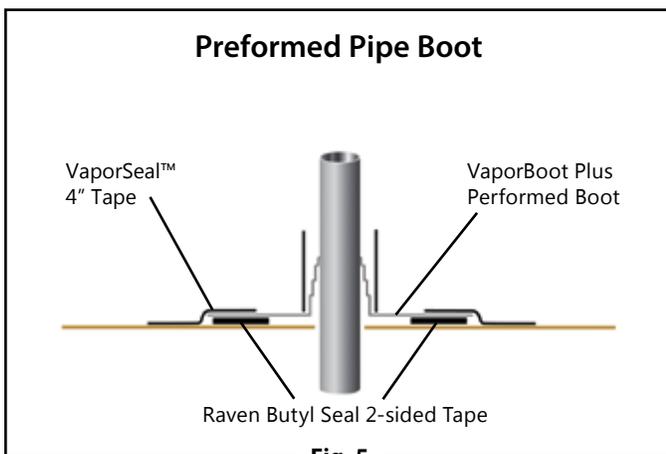


Fig. 5

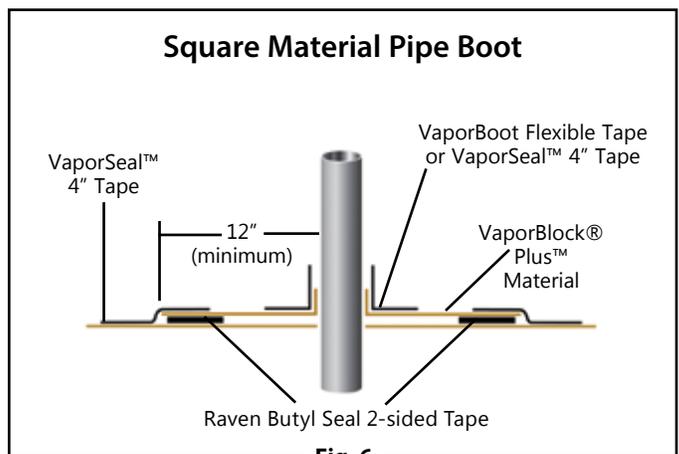


Fig. 6

MULTIPLE PENETRATION PIPE BOOT INSTALLATION

1.5. Sealing side-by-side multiple penetrations (option 1);

- A) Cut a patch large enough to overlap 12" in all directions (Fig. 7) of penetrations.
- B) Mark where to cut openings and cut four to eight slices about 3/8" less than the diameter of the penetration for each.
- C) Force patch material over penetration to achieve a tight fit and form a lip.
- D) Once patch is positioned, seal the perimeter to the membrane by applying 2-sided Raven Butyl Seal Tape in-between the two layers. (Fig. 8)
- E) After applying Raven Butyl Seal Tape between the patch and membrane, tape around each of the penetrations and the patch with VaporSeal™ 4" tape. (Fig. 9) For additional protection apply POUR-N-SEAL™ or an acceptable polyurethane elastomeric sealant around the penetrations. (Fig. 10)

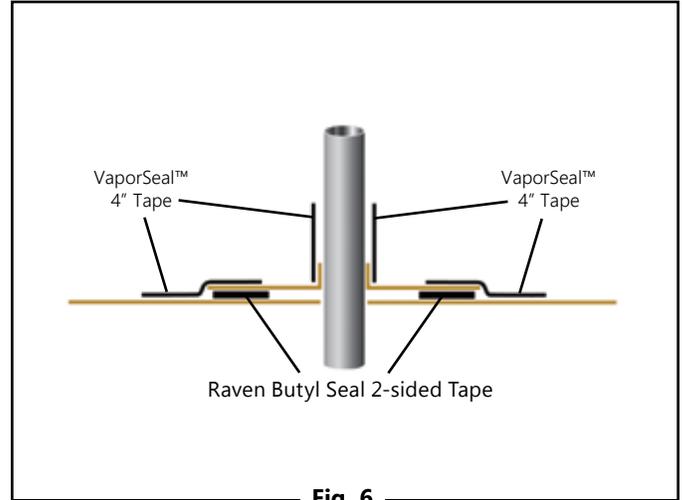


Fig. 6

Option 1

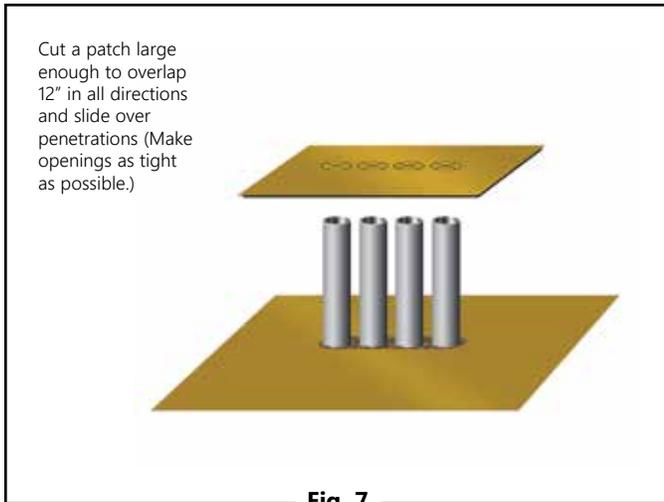


Fig. 7

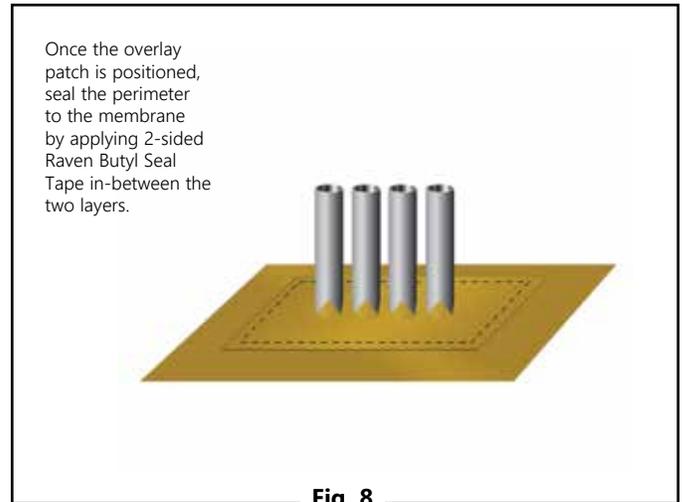


Fig. 8

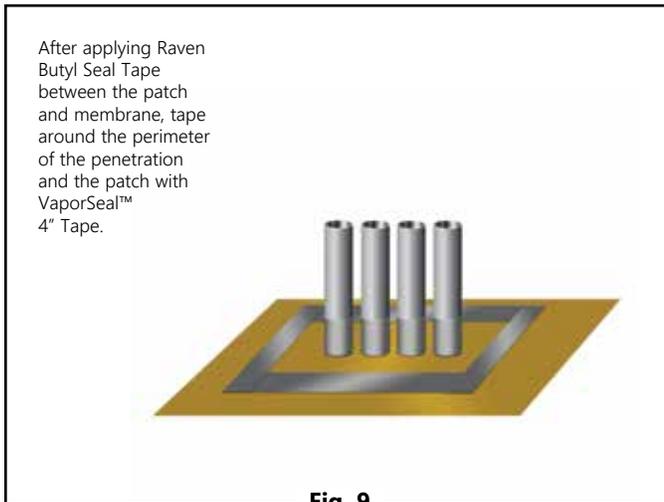


Fig. 9

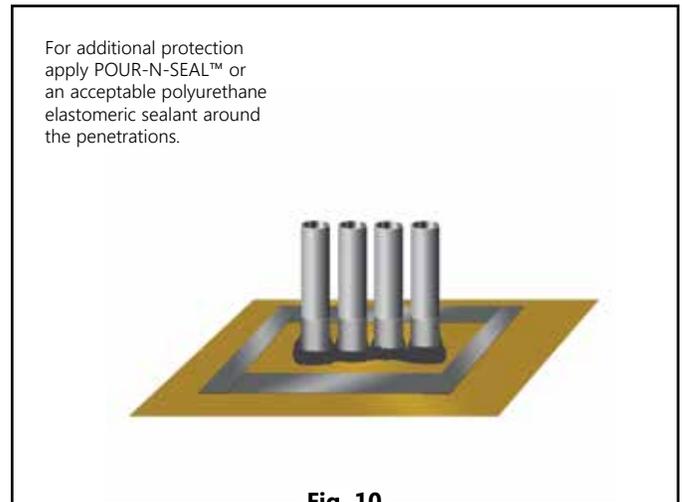
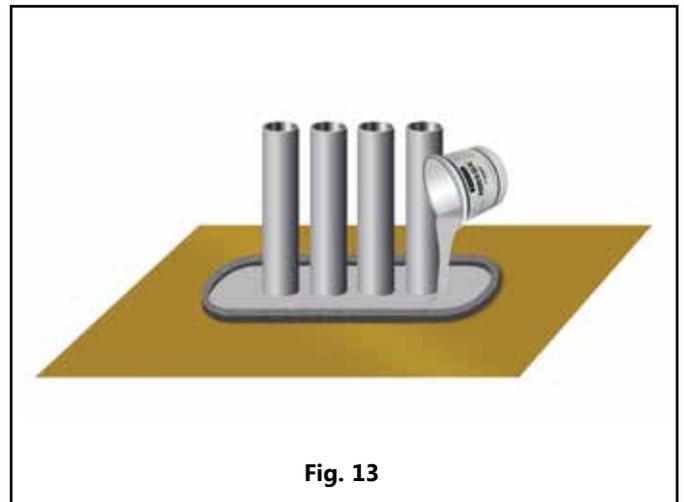
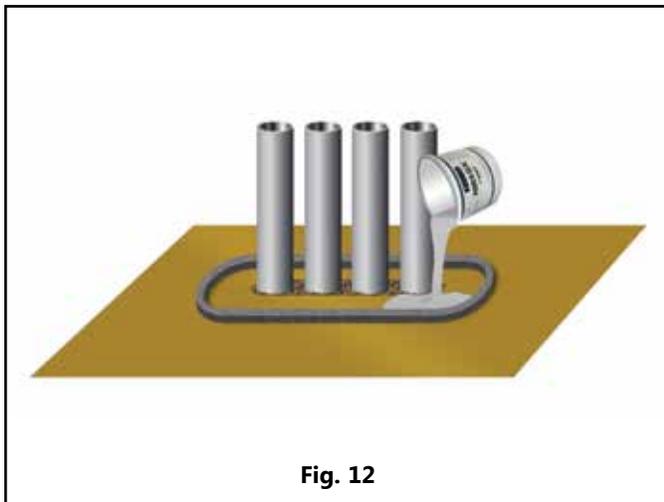
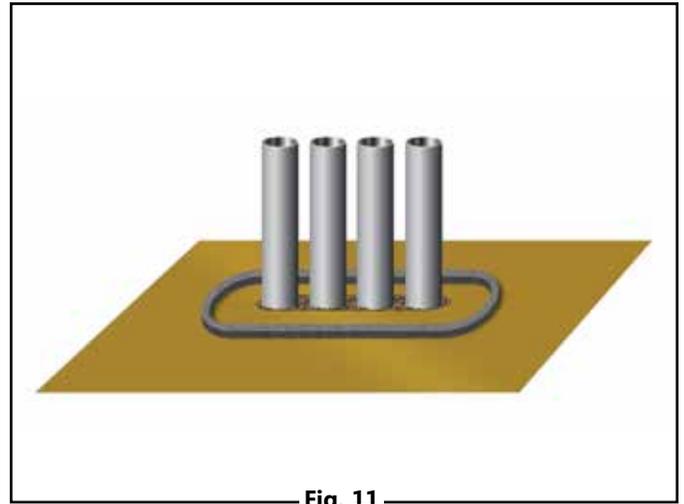


Fig. 10

Option 2

1.6. POUR-N-SEAL™ method of sealing side-by-side multiple penetrations (option 2);

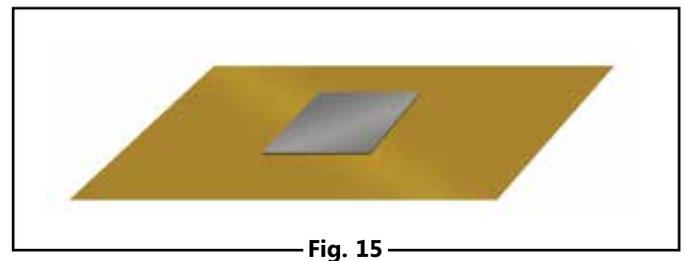
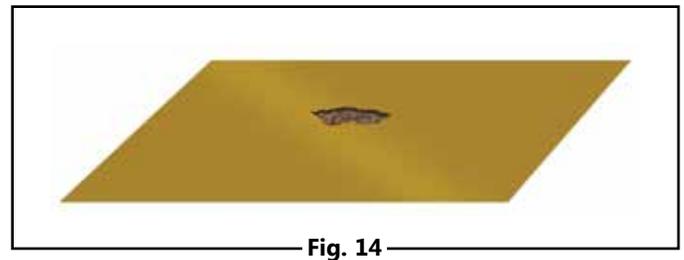
- A) Install the vapor barrier as closely as possible to pipe penetrations to minimize the amount of POUR-N-SEAL™ necessary to seal around all penetrations.
- B) Once barrier is in place, remove soil or other particles with a dry cloth or a fine broom to allow for improved adhesion to the POUR-N-SEAL™ liquid.
- C) Create a dam around the penetration area approximately 2" away from the pipe or other vertical penetrations by removing the release liner from the back of a 1" weather stripping foam and adhere to the vapor barrier. Form a complete circle to contain the POUR-N-SEAL™ materials (Fig. 11).
- D) Once mixed, pour contents around the pipe penetrations. If needed, a brush or a flat wooden stick can be used to direct the sealant completely around penetrations creating a complete seal (Fig. 12-13).
- E) DO NOT leave excess POUR-N-SEAL™ in plastic container for longer than the time it takes to pour sealant.



VAPORBLOCK® PLUS™ REPAIR INSTRUCTIONS

- 1.7. Proper installation requires all holes and openings are repaired prior to placing concrete. When patching small holes, simply cut a 12" long piece of 12" wide VaporSeal™ tape. Remove release liner and center over the opening. Apply pressure to create a seal (Fig. 14-15).
- 1.8. When installing VaporBlock® Plus™ around pipe penetrations, vertical columns, electrical ducts and other obstructions, you will find it necessary to cut it to the nearest outside edge. This cut can be easily sealed with 12" wide VaporSeal™ tape, by simply centering it over the cut, 6" on either side. Once the tape is placed correctly, apply pressure to assure a complete seal (Fig. 16).

Reminder Note: All holes or penetrations through the membrane will need to be patched with 12" VaporSeal™ Tape.



VAPORBLOCK® PLUS™ PROTECTION

- 2.1. When installing reinforcing steel and utilities, in addition to the placement of concrete, take precaution to protect VaporBlock® Plus™. Carelessness during installation can damage the most puncture-resistant membrane. Sheets of plywood cushioned with geotextile fabric temporarily placed on VaporBlock® Plus™ provide for additional protection in high traffic areas including concrete buggies.
- 2.2. Use only brick-type or chair-type reinforcing bar supports to protect VaporBlock® Plus™ from puncture.
- 2.3. Avoid driving stakes through VaporBlock® Plus™. If this cannot be avoided, each individual hole must be repaired per section 1.7.
- 2.4. To avoid penetrating VaporBlock® Plus™ when installing screed supports, utilize non-penetrating support, such as the Mako® Screed Support System (Fig. 17). Avoid driving stakes through VaporBlock® Plus™. If this cannot be avoided, each individual hole must be repaired per figures 14-15.
- 2.5. If a cushion or blotter layer is required in the design between VaporBlock® Plus™ and the slab, additional care should be given if sharp crushed rock is used. Washed rock will provide less chance of damage during placement. Care must be taken to protect blotter layer from precipitation before concrete is placed.

VaporBlock® Plus™ Gas & Moisture Barrier can be identified on site as gold/white in color printed in black ink with following logo and classification listing (Fig. 18)



VaporBlock® Plus™
Gas & Moisture Barrier

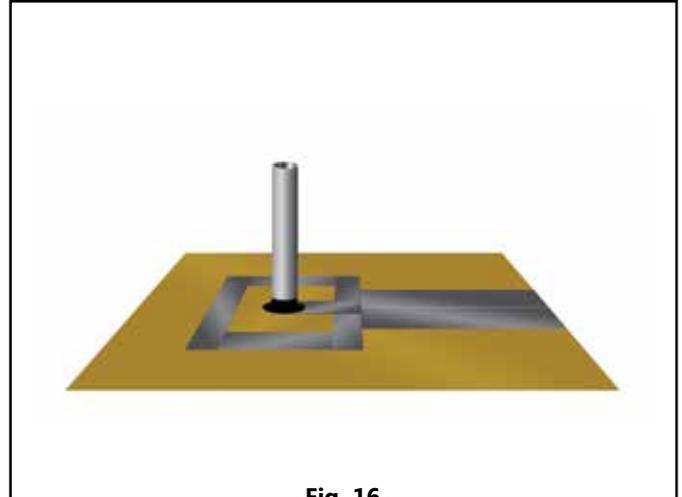


Fig. 16

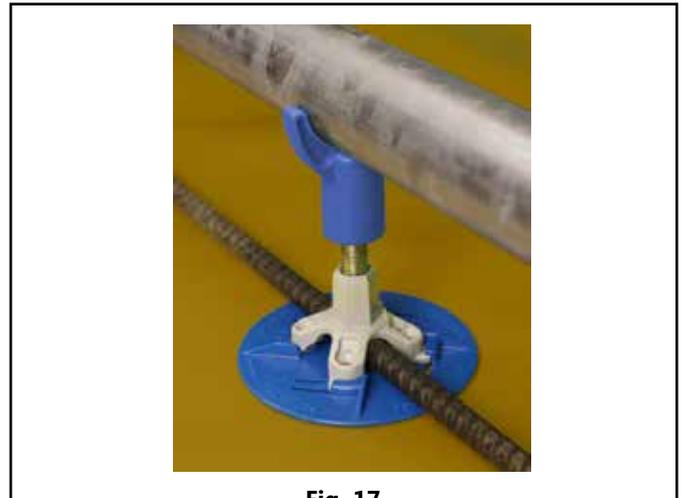


Fig. 17



Fig. 18

* Patent Pending

Note: To the best of our knowledge, unless otherwise stated, these are typical property values and are intended as guides only, not as specification limits. Chemical resistance, odor transmission, longevity as well as other performance criteria is not implied or given and actual testing must be performed for applicability in specific applications and/or conditions. RAVEN INDUSTRIES MAKES NO WARRANTIES AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and disclaims all liability for resulting loss or damage. Limited Warranty available at www.RavenEFD.com

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