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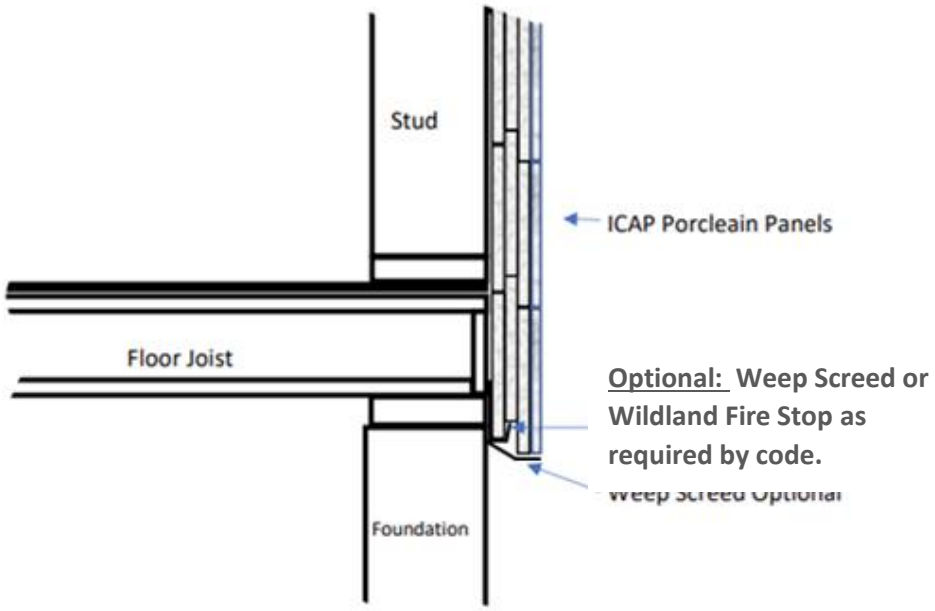
Subject: Frequently Asked Questions (FAQ's) about CastleRock Insulated Porcelain Panels:

CastleRock Panels are a very simple 1-piece panel that interlocks similar to Lego's and staples or screws to the wall. Installation is fast and easy and can be done by tile installers, siding Installers, carpenters, or most anyone with some mechanical abilities.

1. **Starter Metal:**
    a. A formed metal J-hook is required at the bottom of each panel. 48" sections are available from CastleRock Part# SSS-048. They are commonly galvanized steel but can be aluminum. Specifications are in the Installation Guide.

Starter metal at base of wall



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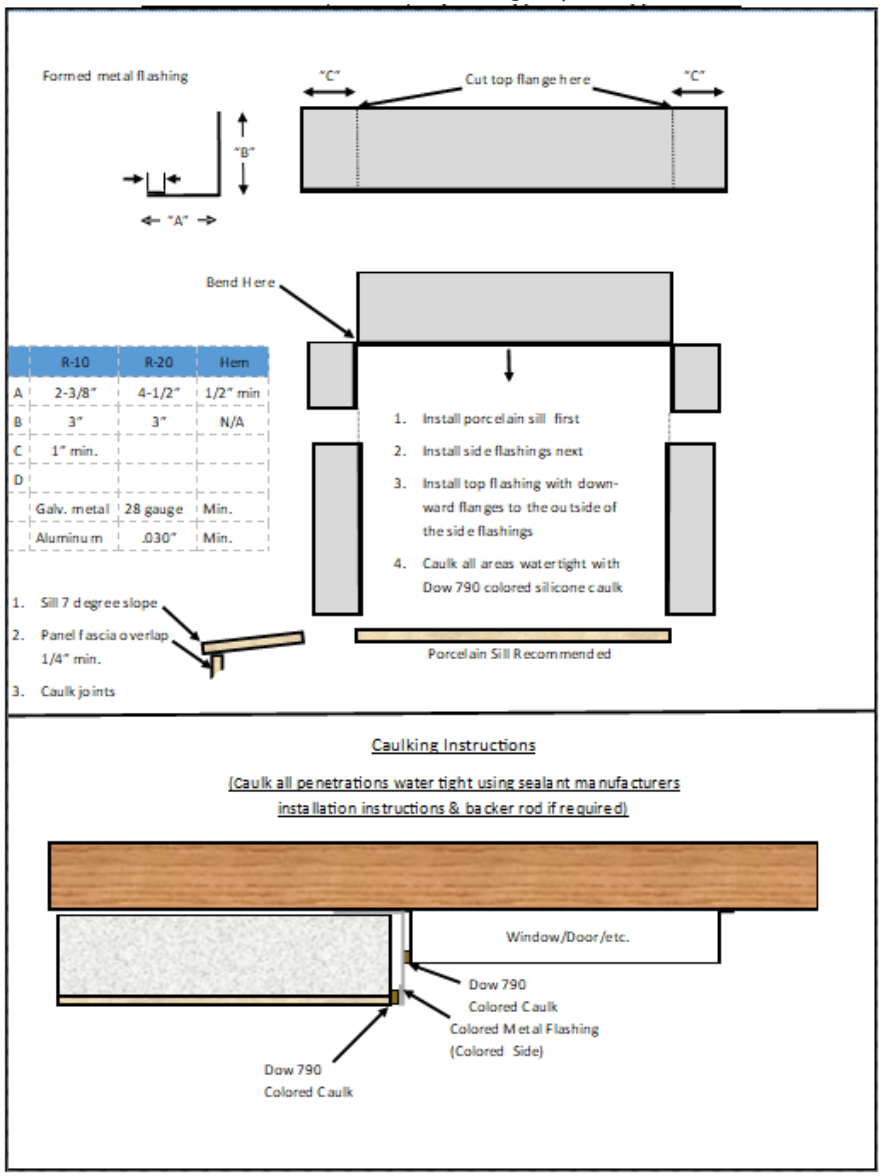
2. **Around Windows & Doors**
   The most common question is "How do you install around doors and windows? There are typically 3 methods depending on the desired finished look and cost of labor.

   a. **Option "A": Colored Metal Flashings** (usually match the window frames):
      i. L-shaped metal with a hemmed front edge. This provides color on both sides of the metal and a smooth, rounded edge. (See Installation Guide for details).



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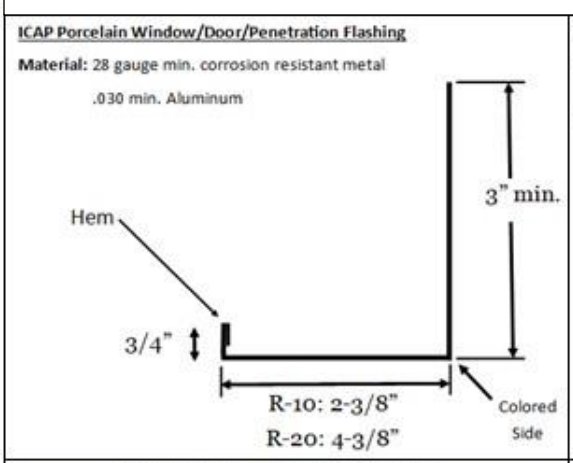
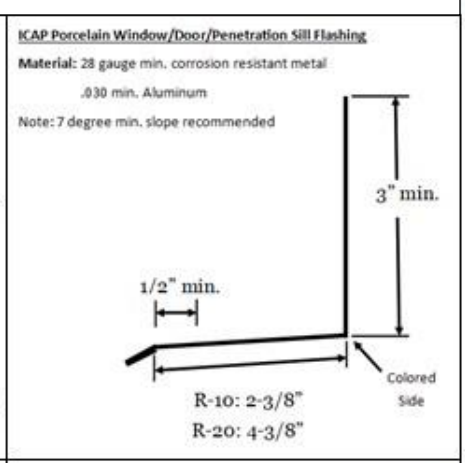
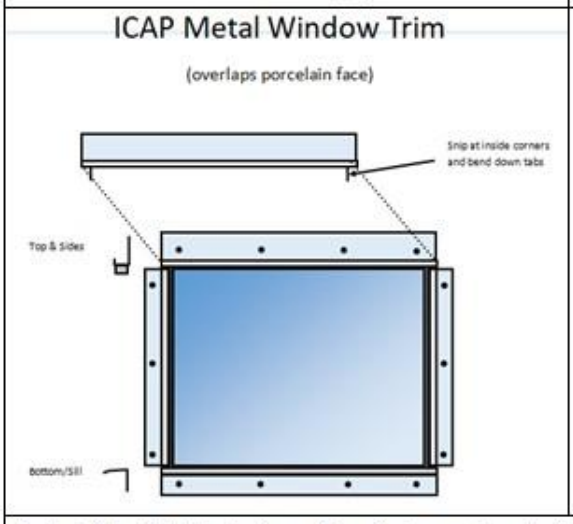
b. **Option "B":**
   i. **J-shaped** metal trim (See Installation Guide for details)

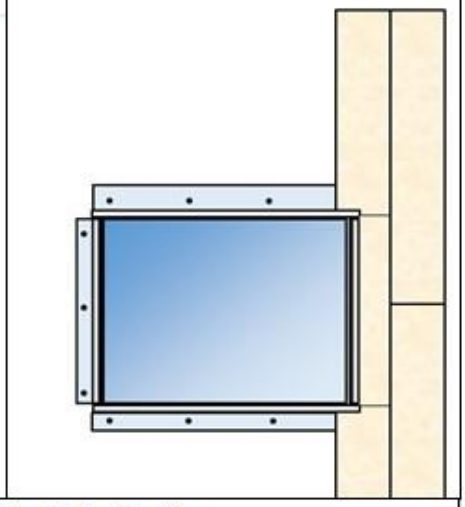
J-hook Style Window/Door/Penetration Trim

(usually provided by others)









1. Install the Sill at the bottom of the window as shown to fit under the side trims.
2. Install the side trim even with the top and bottom of the window frame & fitting the sill.
3. Notch the top trim piece to form tabs and bend down to fit into the side trims for drainage.
4. Seal corner metal joints with silicone sealant.
5. Fit panels to the flashings. Seam side sections as shown and adhere foam together with silicone sealant.

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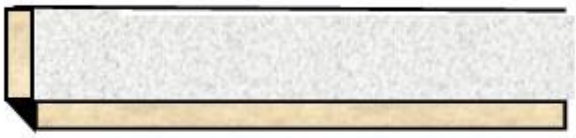
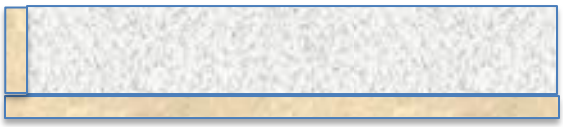
c. **Option "C": Porcelain Returns** (This method is more expensive both for materials and labor)
    i. Butt-fit corner: The fascia remains proud (visible) over the return porcelain to the wall/window. Return porcelain is custom cut to the same thickness of the EPS panel. The "return" to the wall porcelain fills the void from the backside of the porcelain fascia to the wall and covers the panel foam and butts tight to the backside of the fascia porcelain. Grout joints can be designed in and used also. The "returns" are secured with CastleRock recommended adhesives Dow 790, 795, or 1199.

"A" Optional Porcelain Return on Butt End or Window Termination



Butt Joint Return with Fascia Proud

"B"



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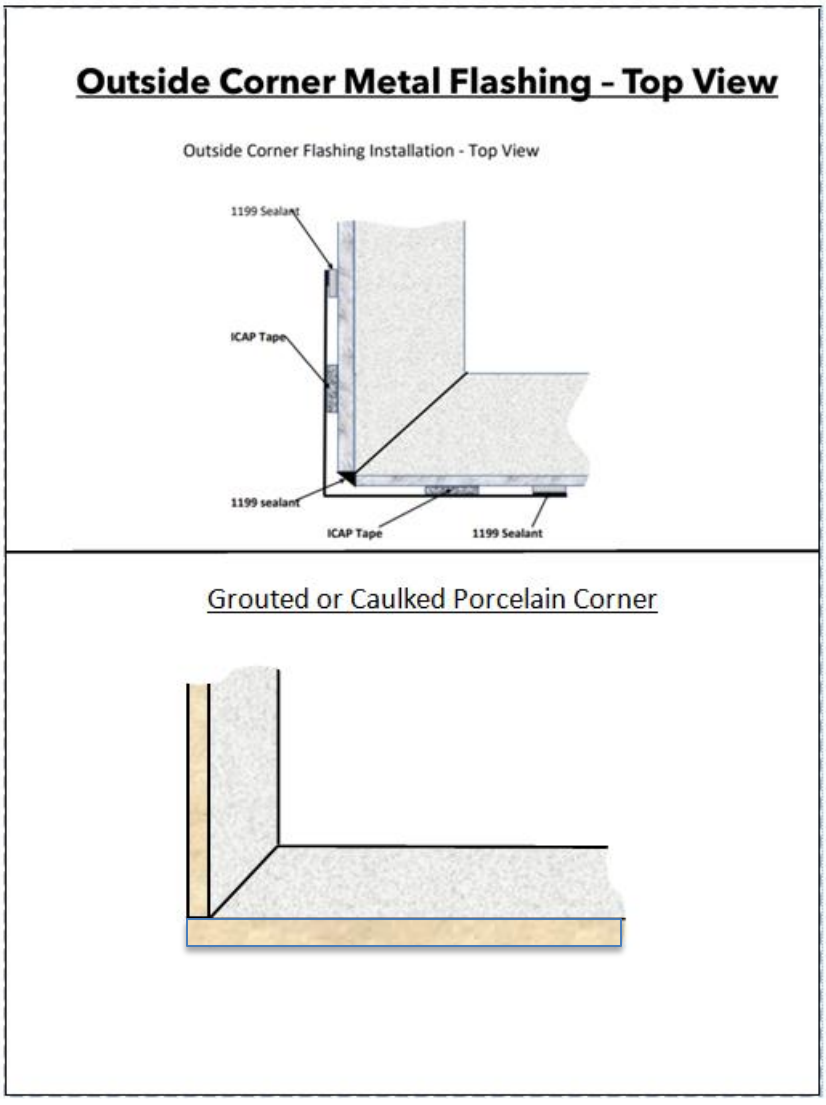
3. **Outside Corners:**
   a. **Option "A":** Colored Metal Flashings (usually match the window frames) or porcelain color. The tile is sealed (Dow 790,795 or 1199 recommended) before the metal trim is installed. A 1/8" x 1" 2-sided foam tape is used to hold the metal corner in place. The 1/8" void created by the tape is filled with sealant to adhere the metal trim to the porcelain and create a watertight seal.
   b. **Option "B":** Butt-fit corners. The foam is cut at 45-degree angles to fit a 90-degree corner. The foam on one side (proud side) foam is cut back the thickness of the porcelain tile so the edge of the butt is not seen from the proud view. An oscillating tool is usually used to remove foam where needed.

(See Illustration on next page)



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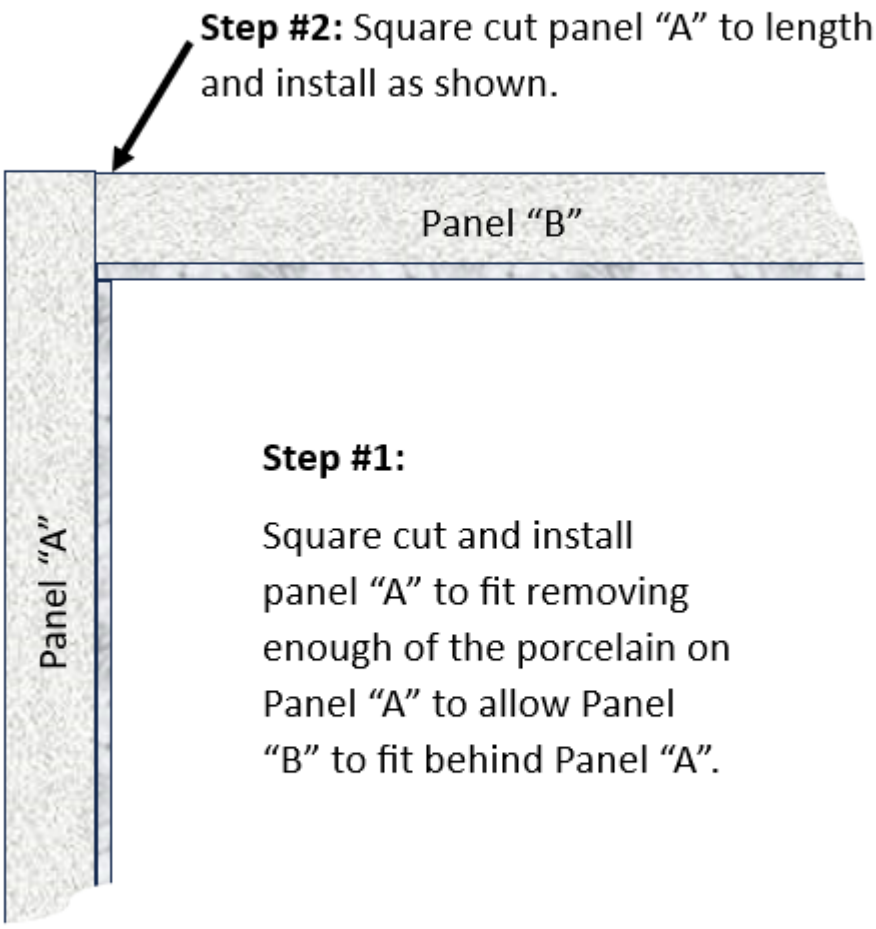
4. **Inside Corners:**

Inside Corner Installation



Note: If a grout joint is desired, remove more of the porcelain from panel "A" to allow space for the grout joint width.

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5. **Wall penetrations:**
    a. **Electrical boxes:** The standard foam panels are 2" thick, but several thicknesses are available for higher R-values up to R-45. A standard 2" deep box is adequate for the standard 2" thick, R—10 panels. Install the box on the outside of the wall (not recessed into the wall) and route electrical wiring in from the back side of the box. A 4" right angle grinder with a diamond blade is usually used to cut a rectangular hole in the porcelain to fit the box. It is recommended the perimeter of the opening in porcelain be sealed with a silicone-based sealant to prevent water intrusion around the box. Install an approved exterior electrical cover plate to finish the installation.
    b. **Other wall penetrations:** Other wall penetrations should be installed in a similar manner by framing out with wood or metal flush with the porcelain and sealing similar to the electrical box.

6. **Rainscreen.** Building codes and customer demand drives interest in rainscreen panels. To respond to these various requests, Castlerock offers optional "rainscreen" options as follows:

    Option A: Rainscreen ¼" spacer buttons installed at the factory or in the field are available. Buttons have 2 long prongs that penetrate the foam to hold them in place. Once attached to the wall the buttons are entrapped between the wall and the foam providing an excellent rainscreen drainage plane. 10mm spacers are also available to meet Canadian requirements.

    a. 

    Option B: Several rainscreen fabrics (such as Mortair Vent®, Delta Dry, MTI Dry, Tyvek Rainscreen, Keene Screen, Sliker Screen and others) are available to be installed a part of the wall system or as a combination rainscreen/WRB. All of these are compatible with the CastleRock Panel system.

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7. **Is CastleRock and the EPS foam a "Green" environmental product?**
    a. Before you can judge a product as to its environmental impact, you need to look at its service life and the benefits it provides.
        i. Whereas a Styrofoam coffee cup is used for 30 minutes, then discarded, it is not environmentally beneficial.
        ii. On the other hand, if CastleRock Insulated siding panel with EPS foam is installed on a building and saves energy for 50-75 years or more, it greatly reduces the carbon footprint and helps the environment.

    For this reason, the Department of Energy (DOE) in cooperation with the EPA, International Building & Residential Codes (IBC &IRC) as well as the American Society of Heating & Air conditioning Engineers (ASHRAE) all include "continuous insulation (c.i.) as a requirement in their building codes.

8. **How do you attach the panels to the wall?**
    a. **Over OSB/Plywood** the best fasteners are 1" crown x 2-1/2" leg staples on 3" centers for a uniform load rating of 126 lbs./square foot which meets or exceeds most building codes. (Note: Staples and the rating are to the sheathing and are not required to attach to studs. Screw/washer assemblies can be used to attach to the studs
    b. **Over 5/8" Type X Gypsum sheathing**, CastleRock specialty screws attached to the sheathing and not the studs are available with very high uniform load ratings. @ types of screws are offered with various ratings depending on the spacing of the screws. A chart is provided in the installation guide for ratings in your area.

9. When the panels do not come out even with the wall length (almost always) or the sides of windows and doors, how do you cut and splice the panels?
    Butt Splice:
    a. First, panels are designed to be installed from left to right, when possible, but can be installed right to left if necessary.
    b. When starting at a corner, cut, and fit the panel to align with a panel from the adjacent wall. Then proceed until you reach the window/door.
        i. If you are using the L-shaped trim metal, simply cut the panel to fit with a small gap between the end of the panel and the flashing to allow a sealing joint of Dow 790, 795 (colored) or 1199 (clear) silicone sealant.
        ii. Above or below the window, the panel can be notched to fit the trim, however, it is usually much easier to terminate even with the side of the window/door with a vertical cut and rip the upper or lower panel to the correct height and install separately. Always keep the top of the tongue in alignment with the full panels on each side of the window/door. To create a "butt splice, cut the adjoining ends each panel at a 90-degree angle panels for a precise fit. Install the left panel first, then apply the Dow adhesive 790/795 or 1199 to the foam on the full height of the joint. Press the panels together and secure to the wall with fasteners.

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Fastener Chart For CastleRock/ICAP Panels

Type X Gypsum Sheathing, Wood or Metal Studs with OSB/Plywood Sheathing

5/8" Densglass Type X Gypsum

Spax® Brand	Densglass® Type X Gypsum	ICAP Panel Size	
		up to 24" Narrow Direction	Lbs./sq.ft.
1/4" Power Lag	Fasteners Spacing C-C	4"	103.6
	Fasteners Spacing C-C	6"	77.7
VersaFast™ VF-3250	Fasteners Spacing C-C	3"	92.2
	Fasteners Spacing C-C	4"	73.7

5/8" GlasRoc Type X Gypsum

Fastener	Sheathing	ICAP Panel Size	
Spax® Brand screws	GlasRoc® Type X Gypsum	up to 24" Narrow Direction	Lbs./sq.ft.
1/4" Power Lag	Fasteners Spacing C-C	4"	136
1/4" Power Lag	Fasteners Spacing C-C	6"	102
VersaFast™ VF-3250	Fasteners Spacing C-C	4"	103.6
	Fasteners Spacing C-C	6"	77.3

Note: All Lbs./sq.ft. rating include ASTM E330 safety margin calculation

To Wood or Metal Studs with OSB/plywood Sheathing

Fastener to Stud			
Metal Stud	Wood Stud & Sheathing	Fastener to OSB/Plywood	Lbs./sq.ft.
# 10x 1-1/4" TEK Screw	#10 x 1-1/4" Deck Screw	Studs & 4" O.C. to Sheathing	88

Fastener to OSB/plywood Sheathing with Staples

OSB/Plywood Sheathing	Fasteners to Studs	Fastener Spacing	Lbs./sq.ft.
1" Crown x 2-1/2" Staples	Not Required	3" O.C.	126

All fasteners require min. 1-1/4" diameter corrosion resistant fender washers. Some areas near salt water may require stainless steel fasteners and washers or 1,000 hour corrosion resistant screws. Check with you local building official for code compliance in your area. (Note: ICAP fasteners are concealed in the foam and not exposed to exterior elements.

Note: *Typical wind load of 100 MPH is Approximately 57.6 lbs./square/foot (PSF)*

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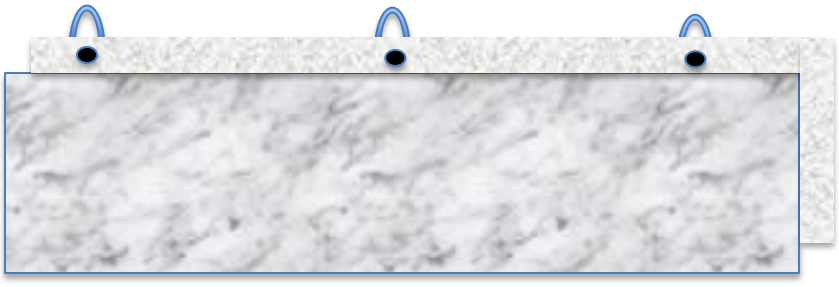
10. **How do you deal with uneven walls:** Several options can be used to keep the face of the panels flush and eliminate lippage:
    a. **Option "A":** Make sure the wall is as flat as possible and void of irregularities before you begin.
    b. **Option: "B":** If you only have one spot in the wall that has a ridge or is uneven, you can use a belt sander or bench sander with a 40 grit belt to sand part of the foam off of the back of the panel. This method also works for small conduits, ground wires, etc.
    c. **Option "C":** "Shims". Horseshoe shaped shims of various thickness are very inexpensive and can be used to "shim" the panels away from the wall at indentations. The horseshoe shape allows you to run a screw through the panel flange and will hold the shim in place (d).
    d.



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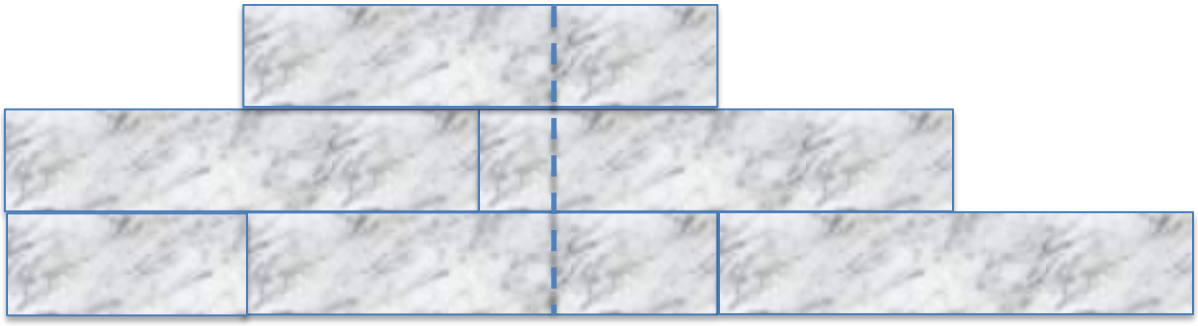
11. Expansion Joints:

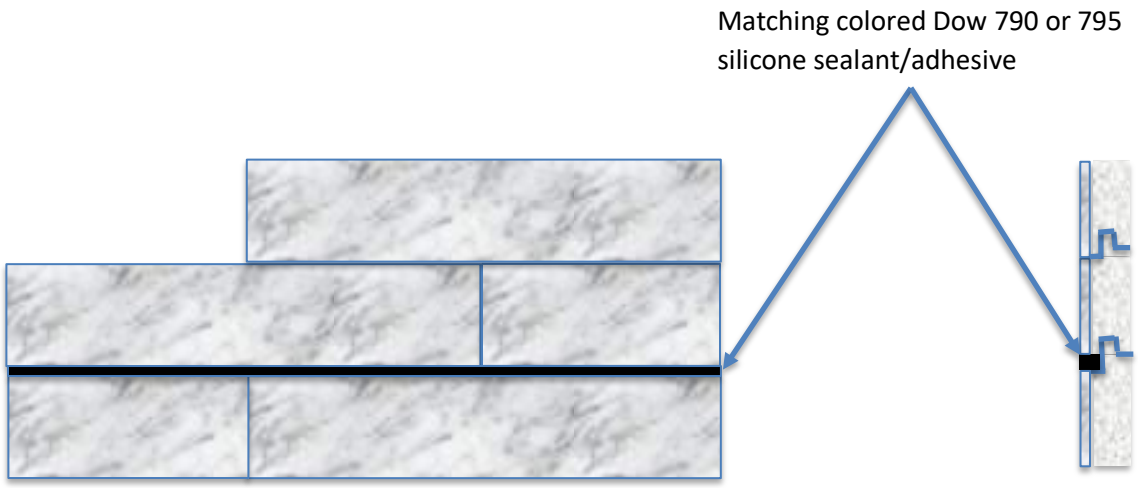
Expansion Joints are required at building expansion joint locations provided by the architect or every 100 Linear feet horizontally and at each floor of a multi-story building.

Vertical Expansion Joint



1. Saw a groove (thickness specified by the architect) or 3/8" if not specified through the porcelain and ½" into the foam.
2. Seal with Dow 790 or 795 colored silicone.

Horizontal Expansion Joint



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Thank you, if you have other questions, please feel free to contact me at the number below:

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