

INSTALLATION INSTRUCTIONS

Thanks for allowing Impressions in Stone to fulfill your manufactured stone requirements! With proper installation, your stone surface should provide you with many years of gratifying service. While our stone products are designed to be installer-friendly, you may wish to consider selecting an experienced, skilled installation professional to achieve the best possible results. Please be sure to read and understand the Disclaimers section at the end of this document.

STEP 1: ESTIMATE THE REQUIRED QUANTITY OF STONE PRODUCT

Our products are delivered in two basic forms: ❶ Flat pieces, which will be applied to flat surfaces, and ❷ Corner pieces, which are specially designed to wrap around 90° (or “outside”) corners.

❶ Our Flat stone products are sold by the *square foot*. To determine the required amount of Flat stone, measure the width and height (in feet) of the surface to be covered, and multiply these two figures together to derive the total square footage amount. For triangular areas, calculate the square footage by multiplying Width x Height x ½. Be sure to deduct from this total amount any areas such as doors or windows which will not be covered with stone.

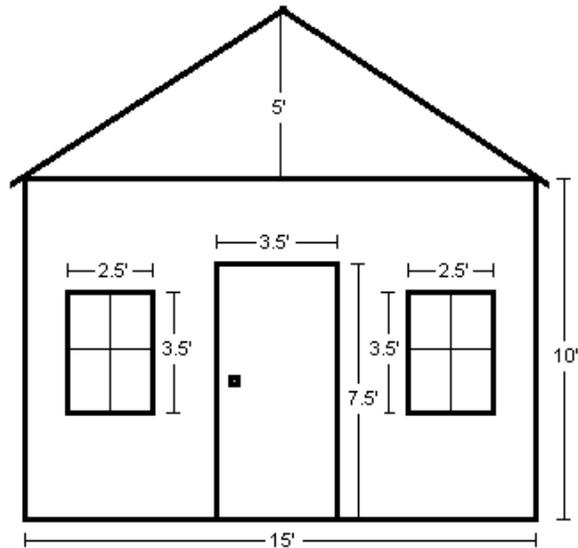
For example, consider the structure shown in the illustration. The structure measures 15’ by 10’ (rectangular area) and is capped with a pitched roof (triangular area). The total square footage of the structure is:

Rectangular Area:	$15' \times 10' =$	150 sq ft
	Triangular Area:	$15' \times 5' \times \frac{1}{2} =$
		38 sq ft
Total Area:		188 sq ft

Next, subtract out the square footage represented by the two windows and the door:

Windows (2):	$2.5' \times 3.5' \times 2 =$	18 sq ft
	Door:	$3.5' \times 7.5' =$
		26 sq ft
Total Area:		44 sq ft

Thus, you would need $188 - 44 = 144$ square feet of Flat stone product to cover this wall surface. Generally speaking, it is not necessary to “over-order” to ensure that you have enough product. Our intent is to always “over-deliver” order quantities, so we rarely see instances where customers run out of product.



② Our Corner stone products are sold by the *linear foot*. Let's say you wanted the left and right corners of the structure to be covered with Corner stones. Each corner contains a total of 10 linear feet, so you would need a total of $10' \times 2 = \mathbf{20 \text{ linear feet}}$ of Corner stones for this project.

Note that Corner stones also cover flat areas in addition to the linear edges. To allow for this, we suggest that you subtract 75% of your total linear footage from your square footage to arrive at the final Flat tally. So, you should order $144 \text{ sq ft} - (75\% \times 20 \text{ ln ft}) = \mathbf{129 \text{ square feet}}$ for your project.

STEP 2: ASSEMBLE THE REQUIRED TOOLS & SUPPLIES

Tools You will need the following:

<input type="checkbox"/> Water supply	<input type="checkbox"/> Wheelbarrow	<input type="checkbox"/> Paint brushes	<input type="checkbox"/> Grout bag	<input type="checkbox"/> Level
<input type="checkbox"/> Lath cutters (center snips)	<input type="checkbox"/> Mason's Trowel	<input type="checkbox"/> Hawk & flat trowel	<input type="checkbox"/> Mortar mixing tool	<input type="checkbox"/> Angle grinder (diamond blade)

Supplies You will need Masonry Type S mortar, felt paper or building paper for use as a weather-resistant vapor barrier (in accordance with local code), 2.5 lb. or 3.4 lb. expanded galvanized diamond mesh lath, appropriate fasteners (galvanized nails or lath screws, in accordance with local code), a coloring agent to achieve the desired mortar tinting (optional), and Silane- or Siloxane-based breathable-type masonry sealer (optional).

STEP 3: SURFACE PREPARATION

Our stone is an “adhered veneer” which requires no footings, foundations, or wall ties and is therefore ideal for both interior and exterior applications. Our products can be applied to any structurally sound vertical¹ wall surface. Prior to installation, it is your responsibility to assess the structural soundness of the target wall surface. Our product is relatively heavy, so please err on the side of caution should you have any concerns about the wall's structural integrity. Do not assume that our products or suggested installation procedures will add any sort of structural rigidity to your wall surface. Finally, ensure that your wall surface is weatherproof prior to installing our stone. Do not assume that our products or suggested installation procedures automatically provide water-resistant characteristics to your wall surface.

¹ Impressions in Stone products are NOT designed to be used in horizontal applications. Usage in such applications will invalidate the product warranty.

Rigid Backwall This substrate includes such surfaces as sheathing², paneling, plywood, sheetrock, and wallboard.



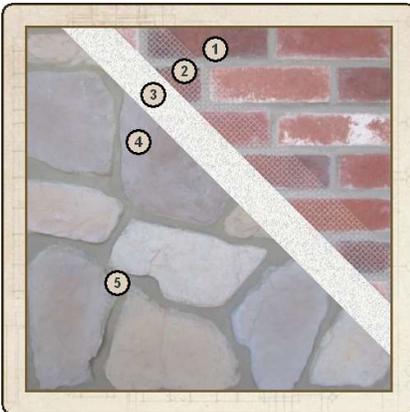
① Rigid backwall (sheathing, in this example), ② weather-resistant barrier, ③ metal lath, ④ mortar setting bed, ⑤ manufactured stone, ⑥ mortar joint.

The surface should first be covered with weather-resistant felt paper, which will serve as a vapor barrier. The paper should be applied horizontally with the upper layer lapped over the lower layer by at least 2 inches. Vertical joints should overlap by at least 6 inches.

Next, 2.5 lb. expanded metal lath should be attached using galvanized nails or lath screws at least 6 inches on center vertically. Fasteners should penetrate the studs by at least 1 inch. The lath should be applied horizontally with the upper layer lapped over the lower layer by at least 3/8 of an inch. Vertical joints should overlap by at least 1 inch.

Both the felt paper and the metal lath should be continuously wrapped around corner surfaces such that each material extends at least 16 inches from the apex of the corner.

Treated Masonry This substrate includes all masonry surfaces such as brick, block, CMU, stucco, and concrete which have been painted, sealed, or treated in some way. It also applies to masonry that is contaminated with form oil or some other release agent. Since some types of cement “backer board” feature a chemically treated surface, we suggest that you consider backer board to be “Treated Masonry” until proven otherwise.

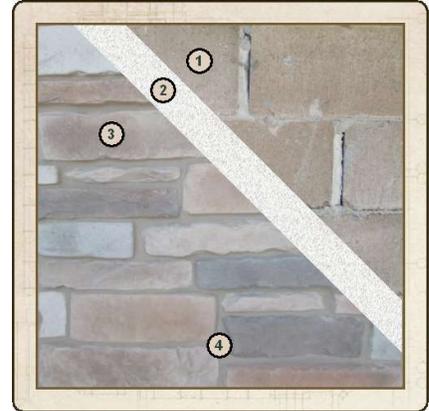


① Painted or sealed masonry or concrete, ② metal lath, ③ mortar setting bed, ④ manufactured stone, ⑤ mortar joint.

First, 2.5 lb. expanded metal lath should be attached using corrosion-resistant concrete nails or screws. The lath should be applied horizontally with the upper layer lapped over the lower layer by at least 3/8 of an inch. Vertical joints should overlap by at least 1 inch. The metal lath should be continuously wrapped around corner surfaces such that each material extends at least 16 inches from the apex of the corner.

² Do not apply stone products to pressure-treated wood surfaces. Pressure-treated wood shrinks as it dries, which may cause the mortar and/or stone to crack.

Clean, Unpainted Masonry This substrate includes all masonry surfaces such as brick, block, CMU, stucco, and concrete so long as the surface is clean (i.e., free of form oil or other release agents) and has not been painted, sealed, or treated in any way. If there is any question about the surface to be covered, please err on the side of caution and assume it does not meet the above criteria. If you are certain that the above conditions apply, then no other surface preparation is required. However, please note that while technically not required, applying a masonry mortar scratch coat to the clean, unpainted masonry surface is generally considered to be a good idea.



① Unpainted masonry or concrete,
② mortar setting bed, ③ manufactured stone,
④ mortar joint.

STEP 4: WORK AREA PREPARATION

The overarching goal of the installation process is to create the appearance of a single, uniform surface rather than “areas” of similarly sized, colored, or shaped stones. A bit of planning in the early stages will go a long way toward helping you to achieve a high-quality result.

When you receive your stone order, it is a good idea to spread the products out at the job site so that you will have a variety of stone shapes, sizes, and colors to mix in to your work surface. Laying out small sections on the ground before applying them to the work surface will help you envision how the section will look once it is installed. To achieve the kind of variety and contrast that is the hallmark of a quality installation, you should attempt to use dark stones next to light ones, small stones next to larger ones, heavily textured stones next to smoother ones, and so forth throughout the entire work surface.

STEP 5: MORTAR PREPARATION

Mortar preparation is probably the single most important factor in achieving a high-quality, secure implementation of our stone products. Good mortar preparation will allow the stone to adhere easily and permanently to the substrate. Poor mortar preparation will do neither.

As mortar will not set up properly in very cold conditions, select a period of time where the temperature is expected to be above 40°F throughout the installation process. DO NOT use any sort of antifreeze product in your mortar mix.

Mortar should be of the Masonry Type S variety. As a general guideline, mortar can be prepared by mixing 1 part masonry cement with 2 parts masonry sand and water. For small to medium-sized jobs, Quikrete’s Commercial Grade Type S Mason Mix (also marketed as Pro-Finish Blended Mortar Mix) is an excellent choice. This material is already pre-blended, so all you have to do is add water.

Regardless of whether you use a pre-blended or custom mortar mix, you **MUST** achieve the appropriate consistency when you add water. The best analogy would be something along the lines of the consistency of applesauce—yes, that wet. Manufactured stone mortar must be considerably wetter than standard brick or stone mortar for two reasons:

- ❶ The high surface tension of water gives the mortar its initial “stickiness”. Mortar that is too dry will not adhere properly to the stone surface and may cause the stone to fall off.
- ❷ A high water content gives the mortar enough time to cure slowly. Mortar that dries too quickly (“flash-dries”) is far more likely to fail.

The mortar may also be tinted with a coloring agent, such as Quikrete’s Liquid Cement Color, to complement the color of the stone being installed. If you do choose to color your mortar, be sure to write down how much color you use per batch of mortar. This will ensure that your mortar color stays consistent throughout your project.

STEP 6: STONE APPLICATION

If the stone is to be applied in very hot/dry weather conditions, the work surface should be dampened before applying mortar. In addition, each stone should be moistened with water prior to installation. This can be accomplished by spraying the stone with a water hose or by dipping the stone into a bucket of clean water.

There are two ways to apply the mortar to the work surface/manufactured stone interface:

- ❶ Apply approximately 3/8 of an inch of mortar to the back of each stone with a mason’s trowel just prior to setting that stone. This is referred to as “buttering” the stone.
- ❷ Apply a mortar setting bed approximately 1/2 inch thick to the prepared work surface using a hawk & flat trowel. Apply only small amounts of mortar at a time to ensure that the mortar does not set up before you apply the stone.

Each method has its advantages and disadvantages. Unless you are a skilled mason, you may find it difficult to apply a suitable mortar bed with the hawk & flat trowel. The mortar bed method also produces more wasted mortar than the buttering method. However, the mortar bed method helps to ensure that enough mortar is used, and the excess provides additional support to newly set stones. It also makes it unnecessary to grout the work surface (although the joints will still need to be dressed). While “buttering” is generally the preferred option, you may wish to experiment with each method to determine which works best for you.

Since this is an adhered veneer, it is not necessary to “stack” upper layers on top of lower layers. Consequently, the stone may be applied in either top-down or bottom-up fashion. The top-down method helps keep any previously applied stone clean, so it may offer a slight advantage over bottom-up.

It is a good idea to begin your work by applying the corners first, since they are slightly less forgiving. Each corner piece has both a long and a short leg, and these should be alternated at every other stone unit. Once the corner stone units are in place, the flat stone units may be applied, working toward the wall center.

You must ensure complete coverage between the mortar and the back surface of the stone unit. Set each stone by firmly pressing the stone into the mortar with a “wiggling” action. If you see some mortar squeeze out around all sides of the stone’s edges, you are using the correct pressure. It is not necessary to “mash” the stone into the mortar—slightly firm pressure with a little wiggle is all that is

required. When you can no longer easily wiggle the stone, the mortar has achieved its initial “set” and you can remove your hands from the stone. The set stone should effortlessly remain securely in place when you release it. If not, remove the failed mortar from the stone and/or wall surface, replace it with fresh mortar, and reapply the stone.

If you are consistently having difficulty getting the stones to stick, consider the following:

- ❶ Is your mortar mix too dry, or too wet? It is generally better for the mortar to be on the “too wet” side than “too dry”, but it can’t be runny or soupy either. Shoot for the consistency of applesauce.
- ❷ Is the mix too sandy? Or, is it too rich (i.e., not enough sand)? The ratio of sand to mortar is very important. Too little of either material can cause problems. Also, the sand should be small grain size—“playground” sand is too big. If there is any question about the quality of your mortar ingredients, try using Quikrete’s Commercial Grade Type S Mason Mix (also marketed as Pro-Finish Blended Mortar Mix).
- ❸ Is the work surface flat and rigid? Work surface irregularities can create high and low points that enable the stone to rock back and forth. Such rocking motion can potentially “pop” newly applied stones off of the work surface. If this may be the problem, consider applying a mortar scratch coat to the work surface and allowing it to dry overnight.

If mortar gets on the face of any stone, DO NOT try to wipe it off while it is still wet—the wiping action will smear the mortar and possibly stain the stone. Instead, allow the mortar to set up until it is crumbly, and then use a paintbrush or whiskbroom to remove the material.

It is important to keep the mortar joints consistent across the entire work surface. A typical joint spacing is approximately ½ inch (about the size of your fingertip), but you can choose a smaller or larger mortar joint according to your aesthetic preference. Stagger the joint lines both vertically and horizontally to achieve the most natural look. When installing regular rectangular stones, be sure to keep your joint lines level. You may wish to snap a chalk line every so often to help you with this.

You will probably need to cut a number of stones in order to achieve the best possible fit. The stone can be cut using an angle grinder or any other cutting saw with a diamond blade. To achieve a very high level of craftsmanship, consider “rounding over” the cut edges to give the cut a more natural look. You should then cover the edge with mortar to conceal the cut. To further conceal the cut edge, turn it down when applying the stone below eye level, or up when applying the stone above eye level.

STEP 7: GROUTING AND JOINT FINISHING

Once a section has been laid, step back and look for any shallow spots in the joints. Use a grout bag to fill in these areas with masonry mortar. Be very careful not to smear the mortar onto the stone face. If mortar gets on to the face of any stone, DO NOT try to wipe it off while it is still wet—the wiping action will smear and possibly stain the stone. Instead, allow the mortar to set up until it is crumbly, and then use a paintbrush or whiskbroom to remove the material.

Allow sufficient time (anywhere from 30 minutes to an hour, depending upon weather conditions) for the joints to become firm. Then use a paintbrush handle, wooden stick, or metal jointing tool to dress the joints and remove any excess mortar above the desired joint depth. Ensure that the mortar in the joints completely seals the stone edges.

STEP 8: FINISHING TOUCHES

After dressing the joints, allow the work surface to set up for a few hours. Then use a clean, dry whiskbroom or paint brush to clean away any loose mortar and dust the face of the stone. After the mortar has set for at least 24 hours, wash the work surface with a water hose to remove any remaining dust or debris.

Because our product is made of concrete, it will absorb water just like any other concrete surface. Over time, the repeated absorption of water in a freeze/thaw cycle may potentially cause permanent damage to the stone. A sealer generally helps to close the pores in the concrete, thereby repelling the water rather than allowing it to be absorbed.

Since manufactured stone is reserved for use in vertical (wall) applications, water and ice usually don't have the chance to sit on the surface long enough to cause a problem. Stone laid at ground level, however, may be at greater risk.

Is a sealer an absolute must? Our experience leads us to believe that it is not. Is it a good idea? In implementations where standing water could potentially cause a problem, it may be a good idea. However, our research indicates that certain impregnating, hydrophobic sealers may actually LEAD to damage from freeze/thaw cycles, so you must be very careful when reviewing your options.

If you elect to use a sealer, industry standards recommend that you always use a high-quality, breathable (i.e., non-filming) masonry sealer in strict accordance with the manufacturer's instructions. And be sure to test your sealer on a small portion of your stone to ensure that the final appearance is what you're looking for.

Finally, give yourself a pat on the back for a job well done!

DISCLAIMERS

The purpose of this document is to give the reader a conceptual overview of how manufactured stone may be securely attached to wall surfaces. This document assumes that the targeted wall surface is structurally sound and, for exterior applications, waterproof. Unfortunately, we don't have experience in building structurally sound/waterproof wall surfaces, so we can't tell you how to do that. For information on how to ensure these attributes, we strongly recommend that you refer to the Masonry Veneer Manufacturers Association's publication entitled "Installation Guide and Detailing Options for Compliance with ASTM C1780" (located here: <http://ncma-br.org/pdfs/masterlibrary/MSV%20Installation%20Guide%205th%20Edition%202nd%20Printing.pdf>). The MVMA is the leading advocate for the manufactured stone industry, and their Installation Guide is considered the gold standard. In all cases, suggestions in our document should be superseded by any conflicting recommendations provided in the MVMA guide.