

Installation Instructions

Thanks for allowing Impressions in Stone to fulfill your manufactured stone requirements! With proper installation in accordance with all local Building Code specifications, 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.

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:

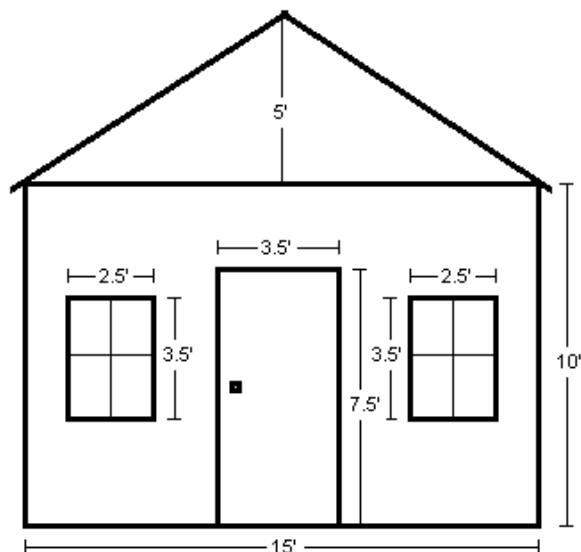
$$\begin{array}{r} \text{Rectangular Area: } 15' \times 10' = 150 \text{ sq ft} \\ \text{Triangular Area: } 15' \times 5' \times \frac{1}{2} = 38 \text{ sq ft} \\ \text{Total Area: } \qquad \qquad \qquad 188 \text{ sq ft} \end{array}$$

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

$$\begin{array}{r} \text{Windows (2): } 2.5' \times 3.5' \times 2 = 18 \text{ sq ft} \\ \text{Door: } 3.5' \times 7.5' = 26 \text{ sq ft} \\ \text{Total Area: } \qquad \qquad \qquad 44 \text{ sq ft} \end{array}$$

Thus, you would need $188 - 44 = 144$ square feet of Flat stone product to cover this structure.

To ensure that you have enough product, you may want to consider purchasing 5% of additional product to account for product breakage, imperfect estimates, etc. Thus, we see that this project would require approximately $144 \times 1.05 = 150$ square feet of Flat stone.



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 $10 \times 2 = 20$ 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, your final Flat count would be $150 \text{ sq ft} - (75\% \times 20 \text{ ln ft}) = \mathbf{135 \text{ square feet}}$.

Step 2: Assemble the Required Tools & Supplies

Tools You will need the following:

- | | | | | |
|---|---|---|---|--|
| <input type="checkbox"/> Water hose | <input type="checkbox"/> Wheelbarrow | <input type="checkbox"/> Paint brushes | <input type="checkbox"/> Grout bag | <input type="checkbox"/> Level |
| <input type="checkbox"/> Lath cutters (snips) | <input type="checkbox"/> Mason's Trowel | <input type="checkbox"/> Hawk & flat trowel | <input type="checkbox"/> Hoe (or other mixing tool) | <input type="checkbox"/> Angle grinder (diamond blade) |

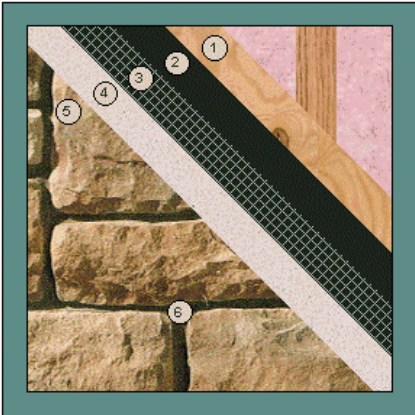
Supplies You will need Type S mortar, felt paper or building paper for use as a weather-resistant vapor barrier (in accordance with local code), 2.5 lb. expanded galvanized diamond mesh lath (3.4 lb. lath for open-stud and metal buildings), appropriate fasteners (galvanized nails, staples, or screws, in accordance with local code), a grout 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 surface. In all cases where a suggested specification is provided, the suggestion should be considered a general guideline and must be superseded by local code requirements.

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.

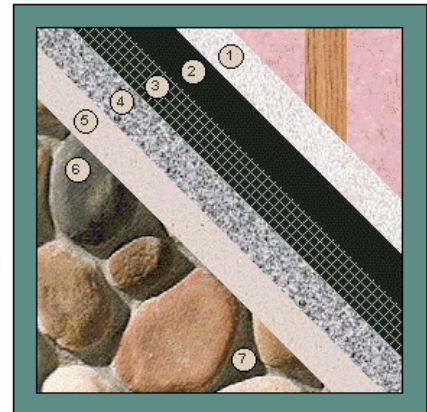
Next, 2.5 lb. expanded metal lath should be attached using galvanized nails or staples at least 6 inches on center vertically. Fasteners should penetrate the studs by at least 1 inch. The lath should be applied horizontally with the upper layer lapped over the lower layer by at least 3/8 of an inch.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

Open Studs The installation procedure for this substrate is the same whether or not any sort of rigid insulation board is installed over the open studs. It also applies to metal studs or metal paneling.

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.

In this scenario, we suggest that you use 3.4 lb. expanded metal lath for added rigidity. The lath should be attached using galvanized nails or staples at least 6 inches on center vertically. Fasteners should penetrate the studs by at least 1 inch. For metal studs or metal paneling, use corrosion-resistant self-tapping screws with at least a 3/8-inch head. The screw should be long enough to achieve at least a 3/8-inch penetration beyond the inside metal surface.

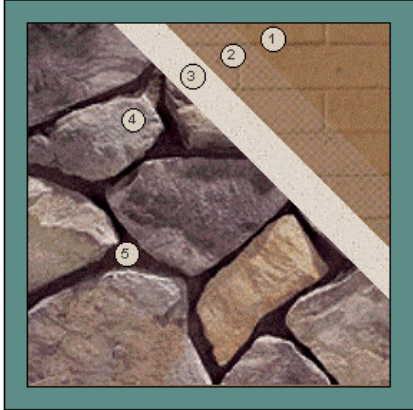


① Rigid foam insulation (optional), ② weather-resistant barrier, ③ metal lath, ④ 1/2" mortar scratch coat, ⑤ mortar setting bed, ⑥ manufactured stone, ⑦ mortar joint.

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. Finally, apply a 1/2-inch mortar scratch coat over the metal lath and allow it to dry for a period of at least 24 hours.

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

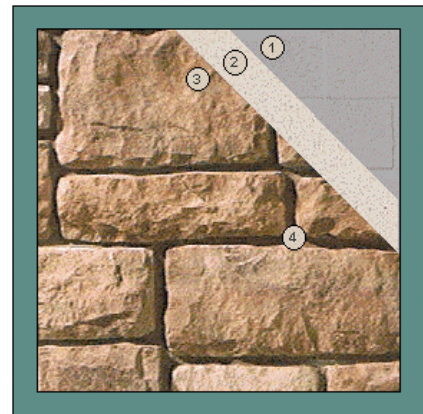
Treated Masonry This substrate includes all masonry surfaces such as brick, block, CMU, stucco, and concrete which have been painted, sealed, or treated in some way. It also applies to masonry that is contaminated with form oil or some other release agent.



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. 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.

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.



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, heavy 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 the 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 relatively small jobs, you may wish to use Quikrete's Commercial Grade Mason Mix (also known as Pro-Finish Blended Mortar Mix). 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 a mortar setting bed approximately ½ inch thick to the prepared work surface using a hawk & trowel. Apply only small amounts of mortar at a time to ensure that the mortar does not set up before you apply the stone.
- ❷ Apply approximately 3/8 of an inch of mortar to the back of each stone just prior to setting that stone. This is referred to as “buttering” 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 & 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). You may wish to experiment with each method to determine which works best for you.

The stone may generally 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 when it comes to fitting them in. Each corner piece has both a long and a short leg, and these should be alternated at every other stone. Once the corner stones are in place, the flat stones may be applied working toward the wall center.

You must ensure complete coverage between the mortar and the back surface of the stone. 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. The stone should easily and securely remain in place when you release it. If not, remove the failed mortar, 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 Mason Mix (also known as Pro-Finish Blended Mortar Mix).
- ❸ Is the work surface flat? Work surface irregularities can create high and low points that enable the stone to rock back and forth. This rocking motion will “pop” the stones off of the work surface. If this may be the problem, consider applying a scratch coat of mortar to the 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 and possibly stain the stone. Instead, allow the mortar to set up until it is dry and 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 grout 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. You should then cover the edge with mortar to conceal the cut. Turn the cut edge 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. Be very careful not to smear the grout onto the stone face. If grout 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 dry and 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, wood 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 DRY whiskbroom to clean away any loose mortar and clean 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 can potentially cause permanent damage to the stone. Since manufactured stone is reserved for use in vertical (wall) applications, water usually doesn'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. A sealer will help to close the pores in the concrete, thereby repelling the water rather than allowing it to be absorbed. Is a sealer an absolute must? Probably not. Is it a good idea? In implementations where standing water could potentially cause a problem, absolutely. So, consider a sealer as a very inexpensive and convenient insurance policy against future damage. Please note that some sealers are designed to "enhance" the surface appearance of the concrete, while others are essentially invisible. Be sure to test your sealer on a small test portion of our stone to ensure that the final appearance is what you're looking for. While we can't make specific recommendations on brands, we suggest that you always use a high-quality, breathable masonry sealer in accordance with the manufacturer's instructions.

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