



# Installation Guide

## Overview

During the design stage of your project, you will at some point, need to estimate the amount of Rocky Mountain Stone Products® required completing your job. It will be necessary to analyze your project in various stages to determine which products will be required for each respective stage.

## Tools Required

Tools may vary depending upon the type of stone applied. Generally, the following is a list of the basic tools that may be required to complete your installation.

1. Safety Glasses & Dust mask (Eye and lung protection)
2. Gloves
3. Measuring Tape
4. Water Source
5. Wheelbarrow & Shovel (Mixing mortar)
6. 5 Gallon plastic buckets (Mixing mortar)
7. Staple gun and Hammer (Paper & Lath fastening)
8. Plasterer's Trowel with 3/8 inch teeth (Scratch coat)
9. Tile saw, wet or dry and/or grinder (Trimming stones)
10. Tile Nippers and/or Hatchet (Trimming stones)
11. Level
12. Chalk Line (Dry-stack applications)
13. Hock & trowel (Mortar application)
14. Grout Bag
15. Jointing tool and/or flat wooden stick (Finishing joints)
16. Whisk broom
17. Tuck Pointer
18. Masonry Trowel (Buttering the back of stone)
19. Metal Shears (Cutting Lath)
20. Utility Knife
21. Sponge

## Materials Required

### A. Mortar

1. Pre-mixed Polymer Modified or Type N mortar meeting ASTM C 270 is acceptable. When using the dry-stacking method to install Rocky Mountain Stone® Products, or installing Rocky Mountain Stone® in a hot or humid climate, a polymer modified mortar mix is strongly recommended.
2. Iron oxide color pigments (If coloring mortar).
3. Potable, clean water.
4. Certain dry climates may benefit from the use of a Acrylic based additive that complies with ASTM C 1438.



#### **B. Weather-Resistant Barrier**

1. Materials that meet the requirements of ICC AC- 38 “Acceptance Criteria for Water Resistive Barriers”.
2. Grade D building material (or acceptable substitution which conforms to Section 1402.1 of the UBC or local building codes).
3. Double wrap inside and outside corner, 16” both directions.

#### **C. Flashing**

1. Flashing shall be rigid, corrosion-resistant, and meet local building codes or comply with ASTM E 2112.
2. To secure a means for water penetration prevention, flashing shall be installed at all areas at top of foundation, above the top row, windows, sills, or other appropriate points of penetration and terminations of stone cladding.

#### **D. Weep Screeds**

1. When conforming to local building codes or applicable UBC or IBC regarding the installation of Weep Screeds, Weepholes must be at least 3/16 inch (4.8 mm) in diameter and spaced less than 33 inches (838 mm).

#### **E. Metal Lath**

1. A layer of self-furred 2.5-pound per square yard (0.95 kg/m<sup>2</sup>) galvanized, diamond metal lath or self-furred #17 gauge. 1 ½" woven wire mesh meeting ASTM C 847.
2. A layer of 3.4-pound per square yard (1.29 kg/m<sup>2</sup>) 3/8' rib, paper backed, expanded galvanized metal lath should be applied for Metal Buildings or Open Stud construction.
3. When applying metal lath to corners, seams must extend out a minimum of 16” from the outside and/or inside corners and overlap a minimum of 3” on vertical joints and 3” on horizontal joints.
4. Or, other local code accepted mesh or lath.
5. All lath and lath attachments must be made out of corrosion resistant material.

#### **F. Fasteners**

1. Galvanized nails, staples, or concrete nails
2. Fasteners must be sufficient in length to allow a minimum penetration of 1 inch (25.4mm) on wood construction.
3. For metal building construction, self-tapping, corrosion resistant flat head screws 1 ¼ in length or, sufficient to obtain 3/8 “(9.5mm) penetration beyond the inside surface of metal sheeting is required.



## Getting Started

### A. Estimating Stone Required

1. **Estimating square footage for materials.** Flats and Corners are the two main components used for most stone veneer installations. Flats are applied to the flat wall surface and are figured in Square Foot increments. Corners are applied to the outside corners and are figured in Linear Foot increments. One linear foot covers approximately  $\frac{3}{4}$  of a square foot of flat space. Using accessories around window and door openings enhances the finished look of your finished project.
2. **Formula for determining materials needed**
  - i. Length x Height=Wall Area
  - ii. Window Width x Window Height = Window Area
  - iii. Wall Area - Window Area x 1.1 = Weather resistant barrier and lath required
  - iv. Linear Feet of Corners X 0.75 = Wall area covered by corners. This amount should be deducted from total Wall Area Number.
    1. EX: Wall Area that is 10'X10' equals 100 Sq Ft; to figure corner amount take 2 (two sides) X10 (how tall section is)=20 Linear Feet of Corner. 20X0.75=15. 15 Sq Ft should be deducted from total Wall Area. Total stone that needs to be ordered is 85 Sq Ft and 20 Ln Ft of Corners.
  - v. Wall Area-Window Area-Corners = Square footage required for flats
3. **Dry-stack exceptions.**
  - i. When applying Rocky Mountain Stone Products® in a dry-stack setting, allow for an additional calculation of 15% since formulas are based upon  $\frac{1}{2}$  inch grout joint spacing. You may also want to order extra stone to allow for trimming.

### B. Water Resistive Barrier

#### 1. Exterior Applications

- i. When installing Rocky Mountain Stone Products® on exterior surfaces, it is recommended that two layers of Grade D, ICC AC-38 weather resistive barrier be applied prior to installation of metal lath.
- ii. Each layer of application should over-lap 6 inches on vertical joints and 2 inches on horizontal joints to ensure a water resistant barrier to surface substrate.
- iii. A rigid, corrosion-resistant flashing should be installed at all wall penetrations. Flashing types and locations should be in accordance with the requirements of the applicable building code. The incorrect installation or absence of flashing, cant strips, gutters and downspouts may result in diversion of water run-off onto finished surface areas. Masonry and other building products subjected to these conditions may develop staining, and when combined with severe freeze-thaw conditions, may eventually cause damage. The application of ROCKY MOUNTAIN STONE PRODUCTS® under these conditions is not recommended and will void any warranty issued by Rocky Mountain Stone Products®.



## 2. Interior Applications

- i. When installing Rocky Mountain Stone Product® on interior surfaces, it is recommended that one layer of Grade D, ICC AC-38 weather resistive barrier be applied prior to installation of metal lath.
- ii. Each layer of application should over-lap 6 inches on vertical joints and 2 inches on horizontal joints to ensure a water resistant barrier to surface substrate.

## C. Work Area

### 1. Prepare your job site

- i. When installing Rocky Mountain Stone Products® on exterior surfaces, clear out debris or other materials which may inhibit movement once installation begins.
- ii. Organize your materials and tools to avoid un-necessary delay in mortar use, as once you have begun using a batch of freshly-mixed mortar, it should be applied before it begins to set up or dry out.

### 2. Lay out your pattern

- i. Choosing stones from several boxes will ensure a balance as each box may vary slightly in color.
- ii. Lay your stones out on a clean surface area such as a tarp prior to beginning installation to evaluate the types of stones you'll place together and in what pattern may work best.
- iii. Mix larger stones with smaller, lighter with darker and smooth with rough to ensure a properly balanced arrangement.
- iv. In a dry-stack setting, be sure to lay out your patterns so the vertical seams are offset.

## D. Mortar

***1. Special Considerations-When applying mortar in a hot or dry climate, special considerations should be taken to prevent excessive absorption of water from the mortar mix. A fine spray of water applied to the back of each stone as well as the masonry backing /scratch coat should be applied prior to the mortar mix. This is especially true if your stone pattern has been exposed to direct sun for prolonged periods of time and allowed to increase in temperature. The backings should appear damp, but not wet, and be free of any surface water. In especially hot and dry climates, the use of an acrylic admix may be desirable to prevent the loss of water from your mortar too quickly. If the stone veneer is being installed over concrete masonry or scratch coat substrate, the surface area should also be dampened before apply the mortar.***

### 2. Mixing your Mortar

- i. When using a pre-mixed bagged mortar, follow the manufacturer's recommendations regarding the amount of water required for each pre-mixed bag.
- ii. Mortar that is too wet or too dry (crumbles under touch) will not bond well with either surface and must not be used.
- iii. Using a drill or shovel, mix the manufacturers recommended amount of clean, potable water to your mix and agitate thoroughly. Be sure to mix completely to break up any dry-mix clumps that may be toward the bottom edges of your container.



- iv. Organize your materials and tools to avoid un-necessary delay in mortar use, as once you have begun using a batch of freshly-mixed mortar, it should be applied before it begins to set up or dry out.

### **3. Coloring Your Mortar**

- i. In certain applications (dry-stack and or ledge stones), tight spacing of stones may not allow the use of a grout bag after installation. Should your scratch coat be a different color than your desired mortar colors, it may be desirable to color your mortar mix and grout as part of your installation
- ii. Use only iron-oxide pigments to color your mortar mix.
- iii. Mix the iron-oxide coloring agents according to manufacturer's recommendation.

### **4. Mortar Application**

- i. Apply a ½ to ¾ inch (12.7 to 19.1 mm) thick Type N (or equivalent of ASTM C 270) mortar setting bed to the back of each stone unit and press into place over the clean masonry surface.
- ii. Mortar can be applied directly to the scratch coat in place of application to the back of each stone.
- iii. Restricting a work area to 10 square feet (0.929m<sup>2</sup>) will ensure your mortar will stay fresh and maintain optimal bonding properties.
- iv. When applying mortar to a job site colder than 40 degrees, it is necessary to tent the work area and possibly apply heat to avoid freezing of the mortar mix before adequate bonding can occur. See IBC 2104.3 for further information regarding cold weather applications.

## **Application of Rocky Mountain Stone Products® Flat and Corner Stones**

### **A. Where to Start**

1. If your project contains corners, always start with the corner pieces first. Since corners generally have a long and short side, stones should be alternated to avoid vertical seams.
2. If your project uses a horizontal pattern of stone such as a dry-stack pattern, ledge stones, or Kwik Fit®, it may be beneficial to start from the bottom, and work up. A chalk line snapped every 4 inches will also aid in keeping your horizontal lines clean and even.
3. Starting at the top can serve as most beneficial since it avoids grout dripping on lower stones. Should mortar accidentally get splashed on a stone face, allow it to dry to a texture that can be brushed off with a stick or dry brush. Never use water to remove grout as it may stain the face of the stone.
4. It is important to keep your stone as clean as possible when installing.
5. For all applications, the scratch coat and veneer must be moistened to reduce the initial rate of absorption.

### **B. Sills and Doors**

1. After the corners have been installed, care should be given to sills and doors.
2. Sills play an important role in the removal of water and should be given careful attention to detail when flashing and installing. Failure to do so could result in water damage to the base structure.



- Galvanized metal support brackets should be installed to support sill stones. These brackets should be fixed to solid substrate with galvanized nails or screws and further bonded in place with construction adhesive and finished with caulk.
- Doors and windows should be flashed and caulked accordingly, before trim stones, or jack arch stones can be applied to complete the trimming of each respective opening.

#### **C. Sill Stones**

- Sills provide a nice transition between your stone wainscot and other exterior pieces. They help with water runoff and can also be used as a windowsill.
- Install sill stones using galvanized metal support brackets like Simpson clips or equivalent. These brackets must have a hold capacity of a minimum of 5lbs/LF.
- Fasten these clips with galvanized nails or screws penetrating the stud at a minimum of 1", 16" on center. Use two brackets per sill if blocking is present.
- Use construction adhesive to bond stone at all bracket locations.
- Caulk and flash as required.
- Use only an approved corrosion resistive flashing that extends to the surface of the exterior wall finish and is installed to prevent water from re-entering the exterior wall envelope.

#### **D. Setting your rock**

- After the corners, sill stones and door trim stones have been installed, start to work your way towards the center, either from the bottom or top.
- Lay your stones out on a clean surface area such as a tarp prior to beginning installation to evaluate the types of stones you'll place together and in what pattern works best.
- Mix larger stones with smaller, lighter with darker and smooth with rough to ensure a properly balanced arrangement.
- Apply a ½ to ¾ inch (12.7 to 19.1mm) thick Type N(or equivalent of ASTM C 270) mortar directly to the scratch coat OR a setting bed to the back of each stone unit and press into place over the clean masonry surface.
- Whichever method of mortar application is used, be sure to obtain complete coverage to the back of each stone.
- Light tapping or firm setting of the stone veneer will ensure a proper bond and allow excess mortar to migrate naturally into your grout joints, ensuring a strong bond.

#### **E. Joint Spacing**

- Care should be taken to keep joint spacing even throughout your installation.
- Spacing of ½ to ¾ inches between individual stones will keep the stones even and allow room for joint grouting after installation is complete.
- Long, straight, unbroken joint should be avoided. Vertical and horizontal joints should be staggered.

#### **F. Broken Stones**

- There will be some breakage of stones in some boxes and these stones can and should be used to fit smaller spaces or unique openings.
- Stones can be trimmed to fit using a hatchet, pair of tile nippers, a hand held grinder with a masonry bit, or other suitable tools. Make sure to rinse the freshly cut stone, to remove any dust that may still be present. To help conceal a cut or broken edge on a piece of stone, cover the edge with mortar when grouting the project.
- Care should be taken to avoid eye injuries by using protective eye wear such as safety glasses and an additional dust mask. Repeat or prolonged exposure to silica dust can be hazardous to a person's health. When cutting stone veneer, a respirator dust mask is strongly recommended. The use of a wet saw will lower the exposure to silica dust.



### **G. Grouting your Joints**

1. Should your joints require additional fill, the use of a grout bag will diminish the amount of spill that may occur when filling the space between stones.
2. Fill your grout bag with the same mortar used to set your stones.
3. Work your way around each stone and fill the spaces to the desired depth between each stone.
4. Some stone patterns can be enhanced with an over-grout finish. This finish fills the joints flush up to the surface of the stones, giving it a different look and texture than the recessed grout joints.
5. Whichever grout finish you choose, be sure to allow the grout to set up to a crumbly texture before attempting to whisk or rake the excess away.

### **H. Finishing the Joints**

1. After the grout has set up to a firm texture, it can be tooled to remove the excess mortar and seal the stone edges completely.
2. Using a Jointing Tool or flat wooden stick, carefully rake away excess grout and tamp down the joint mortar to compress into the joint spaces.
3. Attention to detail at this stage will greatly enhance the look of the installation.

## **General Information**

### **A. Cleaning**

1. Rocky Mountain Stone Products® may never need cleaning. But, on occasion, washing to remove surface dirt and other debris may be required. For dirt, and other debris removal, gently scrub the stone with a dry, soft bristle brush. For stubborn areas, use a solution of granulated or powdered detergent and water. Make sure that the detergent does not contain any bleach or other harsh chemicals. Then gently scrub with soft bristle brush and detergent/water solution. Rinse thoroughly with clean water.

### **B. Efflorescence**

1. Efflorescence may be removed with a solution of 1 part white distilled vinegar to 5 parts water. Gently scrub using a soft bristle brush and vinegar/water solution. Rinse well with clean water.

### **C. Sealing**

1. A sealer will provide added protection and may be easier to clean if the surface becomes dirty. Use only a quality masonry sealer that is of “penetrating breathable” type, that is either a Silane or Siloxane based product. As with any sealer, the color of the stone may change after an application. Be sure to test the sealer on several different places on the stone, to determine if the color change is acceptable.

### **D. Salt and De-Icing Chemicals**

1. Concrete and masonry products are vulnerable to salt and de-icing chemicals. Rocky Mountain Stone Products are not warranted against damage due to the use of salt and other de-icing chemicals. Do not use salt or de-icing chemicals on areas immediately adjacent to Rocky Mountain Stone Products.



#### **E. Rainscreen Statement**

1. Some building codes require a rainscreen behind your manufactured stone veneer cladding. If you are installing manufactured stone veneer in an area that requires this, or a just concerned about weather conditions, we recommend that you choose a rainscreen system that will encompass the following:
  - i. The system should create a space with a minimum depth of 3/16” (10mm) and maximum depth of 3/4” (19mm).
  - ii. Materials should be corrosion resistant as well as rot resistant.
  - iii. Unless otherwise specified, the system should be vapor open.
  - iv. If the rainscreen space is created with material other than solid strapping, furring attached directly to framing, the following must be considered.
    1. Lath fasteners must be capable of supporting the weight of the finished wall cladding system considering the unsupported/cantilevered portion of fastener that is equal to the thickness of the rainscreen materials.

#### **F. Overhead Application**

1. Overhead, horizontal, or sloped applications are not included in our building code evaluation reports or acceptances. These applications often require special approval/inspections by local building code inspectors. Please contact all appropriate parties prior to an these kinds of installations.

#### **G. Installing Rocky Mountain Stone At Ground Level**

1. Keep the finished edge of the Rocky Mountain Stone product a minimum of 4” above grade if earth, or 2” above pavement.
  - i. Use a 2”x4” leveling strip or weep screed/flashing.
    1. Frame, either wood or metal, applications are sometimes, required by code, to have weep screed or a weeped casing bead at the base of the wall or foundation transition.
    2. Provide proper drainage as required by applicable building code.
    3. Avoid possible staining of the stone by soil.

## **Warranty**

Rocky Mountain Stone Products® warrants its products for a period of 50 years from the date of installation to be from manufacturing defects. Rocky Mountain Stone Products® further warrants its product against rust, corrosion, crazing, flaking, and unsightly discoloration. Rocky Mountain Stone Products® will remedy all product failure covered by this warranty by repair or replacement of faulty stone, without charge to the owner, in accordance with the applicable terms and conditions of this warranty.

This warranty covers only manufacturing defects in Rocky Mountain Stone Products® Veneer manufactured by Rocky Mountain Stone Products®. This warranty does not include damages from faulty or improper installation practices or materials, willful abuse, misuse or negligence or damage resulting from fire, lightning, earthquake, or other Acts of God. Also any interruption in settlement of the building, failure of the structure (including foundations and walls), surface discoloration due to air pollution, exposure to harmful chemicals, normal weathering of surface, efflorescence or oxidation, or other caused beyond control of manufacturer are excluded from this warranty.

This warranty covers only the replacement of stone from defective manufacturing. Rocky Mountain Stone Products®, its assignees or successors are not responsible for labor costs associated with removal



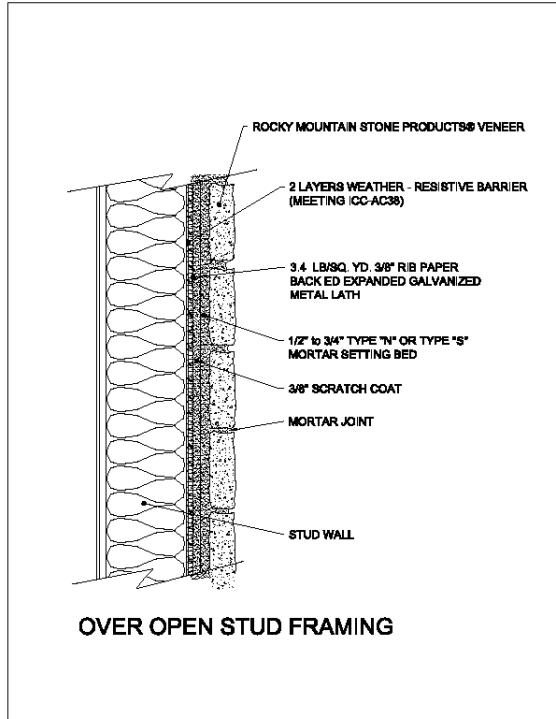


of defective stones, or installation of new stones, nor the improper use of stones in non-approved applications such as under water or foot traffic.



## Surface Preparation

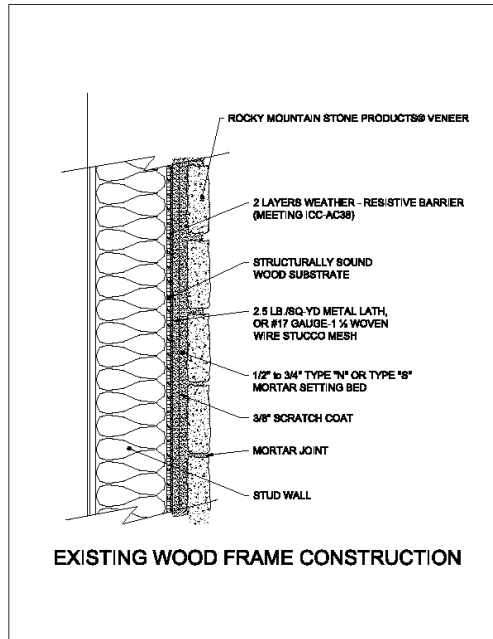
### A. Application to Open Stud Framing construction



1. Rocky Mountain Stone Products® thin brick and natural-looking stone can be applied to open wood studs with maximum space of 16 inches (406 mm) on center. Open studs should be covered with two layers of water-resistant backing complying with UBC 1402.1.
2. A layer of 3.4-pound per square yard (1.29 kg/m<sup>2</sup>) 3/8" rib, paper backed, expanded galvanized metal lath should be applied over the top of the water-resistant barrier secured by galvanized furring nails, spaced 6 inches (152 mm) and sufficient in length to allow a minimum penetration of 1 inch (25.4mm).
3. A scratch coat of Type N mortar (or equivalent) approximately 3/8 inch (9.5mm) thick is then applied over the metal lath. The scratch coat should be allowed to cure no less than 48 hours before applying mortar bed.

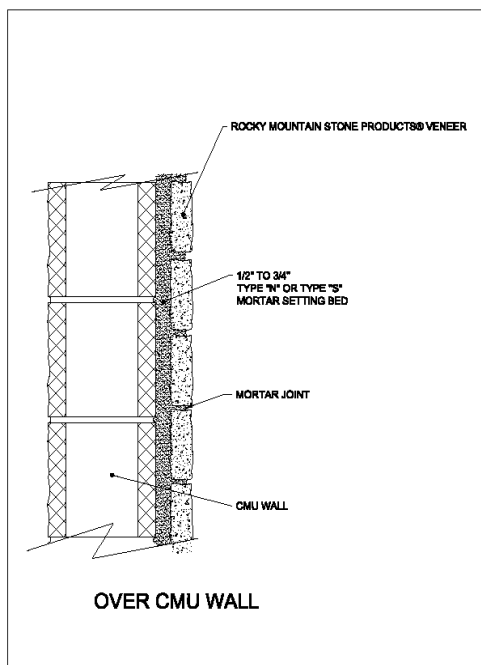


## B. Application to existing wood-frame construction



1. Application of stone veneer to existing wood-frame construction must have a stable base providing support. Exterior wood siding surfaces must first be covered with two layers of water-resistant barrier of Grade D building material or acceptable substitution which conforms to Section 1402.1 of the UBC.
2. A layer of 2.5-pound per square yard (0.95 kg/m<sup>2</sup>) metal lath or #17 gauge, 1 1/2" woven wire mesh should then be secured over the top of the water-resistant barrier secured by galvanized furring nails, spaced 6 inches (152 mm) and sufficient in length to allow a minimum penetration of 1 inch (25.4mm).
3. A scratch coat of Type N mortar (or equivalent) approximately 3/8 inch (9.5mm) thick is then applied over the metal lath. The scratch coat should be allowed to cure no less than 48 hours before applying mortar bed.

## C. Application to Masonry



1. Rocky Mountain Stone Products® thin brick and natural-looking stones can be applied with mortar directly to a clean masonry backing without the need for metal lath. If the surface is painted or not porous, it should be sand-blasted or water-blasted prior to installation to ensure an adequate bonding surface. Once sandblasted, surface area should be thoroughly rinsed to remove excess residue.
2. Surface can also be scored with a wire brush.



## Code compliance/evaluations/listings

Rocky Mountain Stone Products® have been found to be compliant with ICC AC 51 in the following areas tested:

- ASTM C 567 Light Weight veneer unit weight
- ASTM C 190 Tensile strength
- UBC 32-12 Water Absorption
- ASTM C 348 Flexural Strength
- ASTM C 67 Freeze / Thaw

Testing performed by Authorized ICC testing facility, PSI, Inc.: Veneer System Material Properties Evaluation, Report No. 689-16274-1, March 1, 2008