FOR DESIGN & CONSTRUCTION PROFESSIONALS

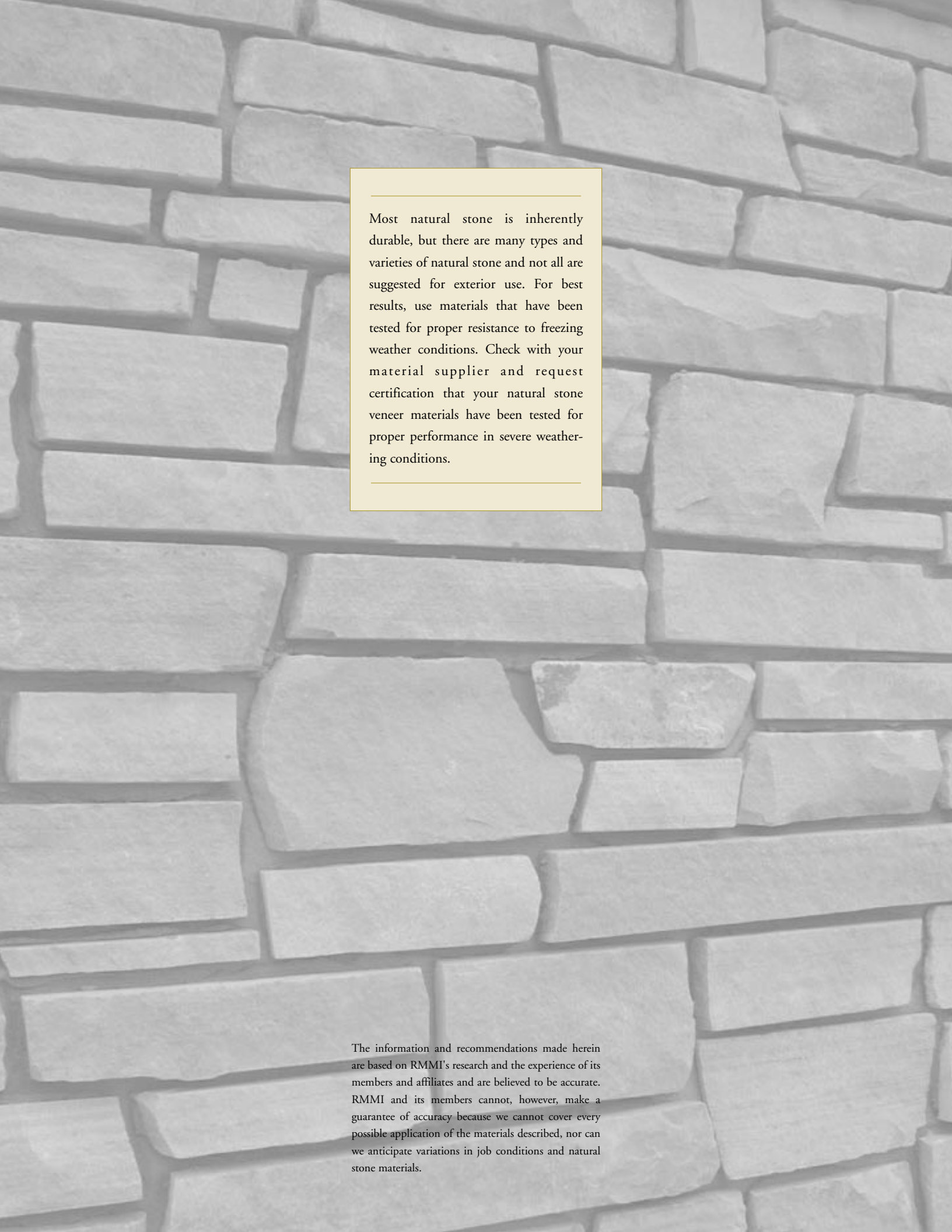
The Rocky Mountain Masonry Institute's

Adhered Natural Stone Veneer Installation Guide

Prepared by:
Atkinson-Noland & Associates, Inc.
Consulting Engineers

for

Rocky Mountain MASONRY INSTITUTE

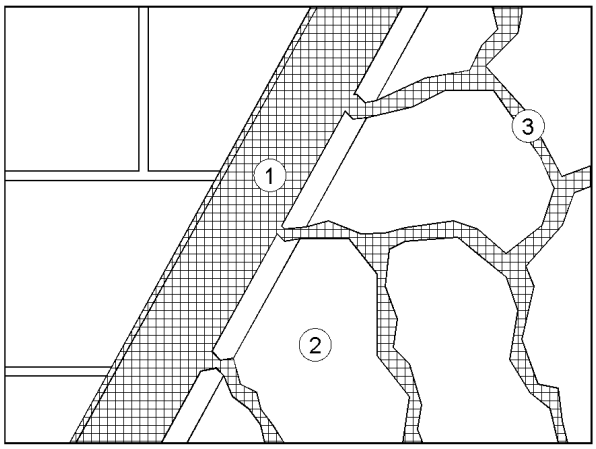


Most natural stone is inherently durable, but there are many types and varieties of natural stone and not all are suggested for exterior use. For best results, use materials that have been tested for proper resistance to freezing weather conditions. Check with your material supplier and request certification that your natural stone veneer materials have been tested for proper performance in severe weathering conditions.

Preparing the Backup Surface for Mortar Application

Concrete/Concrete Block/Cementitious Stucco

MASONRY OR CONCRETE:



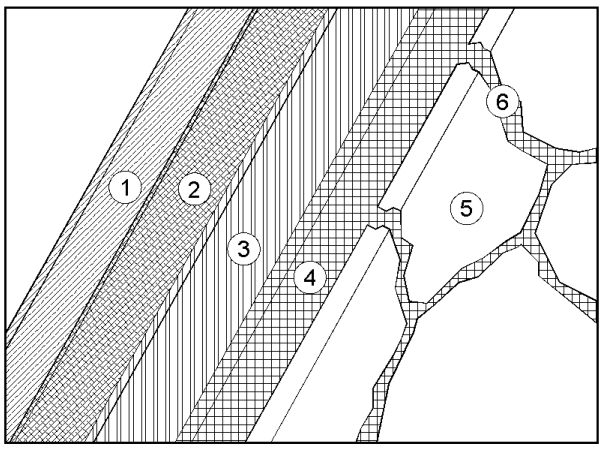
In sequence: (1) mortar applied directly to untreated masonry, concrete or stucco, (2) natural stone veneer, (3) mortar joint.

1a. Concrete/Concrete Block/Stucco needs to be clean and in its original, untreated condition. If the surface has been treated, light sandblasting or waterblasting can be used to restore the wall to a smooth, clean surface. Remove all form-release agents, dust, etc., that may inhibit the mortar bond.

1b. Alternately, you can securely attach metal lath to the wall every 6" on center and apply a scratch coat of mortar $^{1}/_{2}$"-$^{3}/_{4}$" thick. Use a toothed scraper, notched trowel or small piece of lath to lightly rake horizontal grooves in the scratch coat. Allow the scratch coat to cure for a minimum of 24 hours.

Open Studs (Metal or Wood)

WOOD FRAME:



In sequence: (1) sheathing, (2) building paper, (3) galvanized metal lath, (4) mortar, (5) natural stone veneer, (6) mortar joint.

1. Apply sheathing over the studs. This sheathing can be exterior OSB, plywood, exterior grade drywall, wallboard or cementitious board.

2. Staple the building paper to the sheathing. Attach the building paper in horizontal strips. Start at the bottom and overlap 2" (like shingles). Overlap the vertical joints by at least 6". If using flashing or support brackets (anchors), install them before proceeding to the next step.

3. Screw, staple or nail the metal lath to the studs with a maximum horizontal spacing of 16"o.c. Overlap the metal lath at least 1" for horizontal and vertical joints. At corners, overlap the vertical joints at least 16" around the corner to avoid corner cracking. Use barbed galvanized nails at 6"o.c. vertically for exterior work or steel wire furring nails at 4"o.c. for interior work. Minimum nail penetration is 1" into the studs. For steel studs, the lath must be anchored with corrosion resistant screws that have a minimum shank diameter of 0.190". *(Fig 1A)*

4. Apply a scratch coat of mortar that is $^{3}/_{8}$" to $^{1}/_{2}$" thick over and embedding into the metal lath. Use a toothed scraper, notched trowel or small piece of lath to lightly rake horizontal grooves in the scratch coat. Allow the scratch coat to cure for a minimum of 24 hours. *(Fig 1B)*

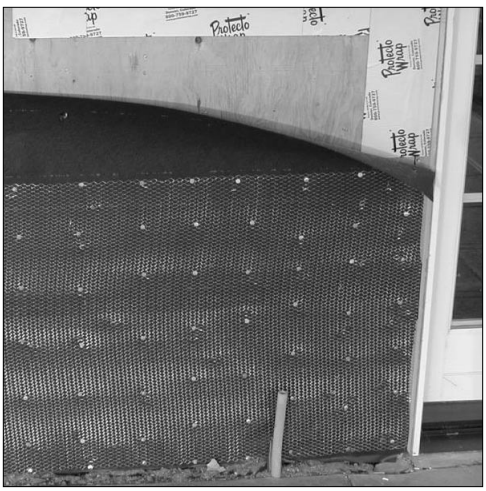


Figure 1A - Attaching Metal Lath

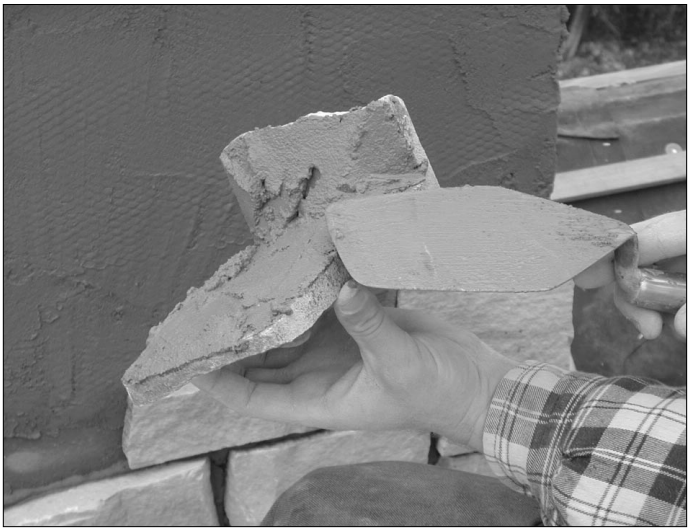
Figure 1B - Applying Scratch Coat of Mortar

Mortar Application and Stone Placement

Starting Point

You can start laying stones at the top or the bottom of the wall. Working from the top down may keep mortar droppings from staining stones below, but make sure the mortar is strong enough to hold the suspended stone in place.

If beginning from the bottom, use a straight-edge and start 4" above soil or 2" above concrete to keep moisture from being absorbed from the ground. If your wall requires corner pieces, place these stones first. After your corner pieces are in place you can continue with the field stones.



Mortar Application

At the beginning of the workday, sponge or hose down the entire surface of the wall. This keeps the moisture from the wet mortar from being absorbed by the wall. Remoisten your work area with a fog spray or wet brush every hour. You want your work area to be damp, but not wet.

Using a trowel, apply mortar $^{3}/_{8}$" to $^{3}/_{4}$" thick to your work area. Push the mortar layer directly onto the backup wall (for concrete/concrete block/stucco) or into the scratch coat (for open studs) with firm pressure on the trowel. Keep your work area limited to 10 square feet, so the mortar on the wall will not set before you can place the stones.

Setting Stones

Before you are ready to set absorptive stones, such as sandstone and some limestone, mist or brush the back of the stone to make it damp, but not wet. Do not pre-wet dense granites or other stones with less than 1% absorption. Natural stones do not absorb much water and a saturated stone will not adhere to the mortar.

Just before placing the stone, cover 100% of the back of the stone with $^{1}/_{2}$" of mortar. Place a slight excess of mortar at the edges of the stone. This will allow some mortar to squeeze out the stone edges and fill the joints when pressure is applied. Once the stone has been firmly pressed into the mortar bed, gently tap the stone with a soft mallet to set it in place. Be careful not to tap too hard. Some stud systems may be flexible and setting adjacent stones by tapping may dislodge a stone. Do not disturb or tap the stone after it has been set. The resulting total mortar thickness behind the stone should be between $^{1}/_{2}$" and $1^{1}/_{4}$".

Joint Width

Proper joint width depends on the type of stone being used and the desired appearance. For wide joints, more mortar may need to be placed on the back of the stone. For thin joints, less mortar should to be used. Be aware that increasing the amount of mortar on the back of the stone unit increases the possibility of mortar droppings on the stones below it. This also adds extra weight, which may cause the stones to be too heavy and fall off the wall. Make sure to keep your joints uniform in width. If your joints are greater than $^{1}/_{2}$" in width, shrinkage cracks may develop within the joint.

Cutting and Trimming Stones

When placing a stone, try to find one that looks like a good fit with its neighbor. Some of these stones will still need to be trimmed to fit neatly and maintain uniform joint widths. To cut the stone, use a handheld grinder with a diamond cutting wheel or a chisel and hammer. If you prefer a rougher cut, score the back of the stone with the grinder and then use the hammer to break the unwanted pieces off. After the stone has been cut and trimmed, use a sponge or brush to assure that all grinding residue and dust have been removed.

Grouting and Finishing Joints

After the stone is in place and has set for 24 hours, come back and fill the joints using a pointing tool or grout bag. The final joint finish helps the wall resist moisture penetration. Tool the joint using a concave joint tool to compress and smooth the joints for maximum water resistance. Rough cut or raked joints will not be as water resistant as tooled joints. Brush away any crumbles or mortar tags after tooling the joint. We do not recommend installing stone veneer with open joints outside in climates with freeze/thaw weather cycles. Dry stack installation can be used for interior installations or warm climates where it does not freeze.

Clean up at the End of the Day

At the end of the workday, gently brush mortar smears off the stone. Do not use aggressive high pressure cleaning methods to clean the wall. They might loosen the stone. Natural stone is resistant to many chemicals, but some types of cleaners can damage the stone. Talk to your stone supplier to get specific recommendations for cleaning your stone.

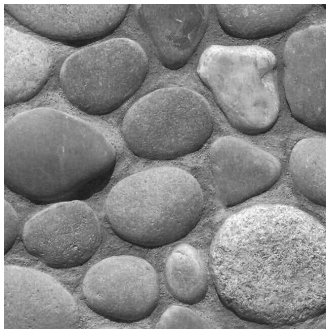
Workmanship

Installation of adhered natural stone veneer is relatively straightforward, but requires an experienced tradesman with a keen eye to fit the stones in an attractive pattern.

Important workmanship issues to consider include:

- Complete mortar bedding at the back of the stone is essential. Even small voids can collect water over time, leading to premature failure.
- Mortar joints need to be full and well-tooled, without voids or cracks that may let water into the wall. Dry-stack patterns are not recommended for exterior use in harsh environments like Colorado, with lots of freeze/thaw cycles.
- Mortar joint width should be fairly uniform. Very wide joints are likely to develop shrinkage cracks. Narrow joints are difficult to fill properly.
- The bond pattern should be "comfortable" – avoid the use of occasional large or very small stones. The final product should have the appearance of load-bearing masonry, as shown below for several typical stone patterns.

Rough Ashlar



River Rock

Ledgestone

Cobble Stone

Interior Uses

Most interior stone veneer installations are not exposed to moisture so you do not need to take steps to prevent water penetration. For dry interior applications, thin stone can be adhered to the backup wall using mortar or special epoxy adhesives approved for thin stone applications. In these installations, the weather resistive barrier is no longer needed.

The acceptable types of backup walls for interior applications are:

- Concrete
- Concrete Masonry Units (CMU)
- Brick
- Cementitious Board

Apply a thin bed of adhesive over these backup walls using the flat side of the trowel. Then apply an additional coat of adhesive using the notched side of the trowel. You can now place the stone. If needed, cover the back of the stone with adhesive to achieve correct coverage and bedding. Once the stone has been firmly pressed into the adhesive bed, use a soft rubber mallet to set the stone. The resulting total adhesive thickness behind the stone should be a minimum of $^1/_4$".

Mortar/Adhesive Pros and Cons

Type N vs. Type S Mortar

- Type N is a good all-around mortar choice for most applicaions. In hot weather applications, it performs better and overall it is easier to use.
- Type S has a stronger bond, but with this increased bond strength comes an increase in possible shrinkage and cracking. Type S may be required by some building codes, especially in seismic areas.

Portland-Cement-Lime (PCL) vs. Masonry Cement (MC)

- PCL has a stronger bond and should be used whenever possible.
- MC has better workability, which many masons prefer, but it has a weaker bond strength due to its high air content. It also retains less water, which can result in rapid mortar dry-out when used in hot weather.

Mortar Bonding Agents

Bonding agents are added to mortar to increase its bond strength. They are normally not required if correct application procedures are followed. Some installers will use bonding agents for additional "insurance" and to avoid call-backs. Be extra careful to keep the wall clean if you use these high bond mortars. Their droppings are difficult to clean off once they cure. Talk with your stone supplier for recommended bonding agents for your stone.

Adding a bonding agent to your mortar may be advantageous in the following applications:

- Soffits or other overhead uses.
- When placing non-absorptive, high density stones (such as granite or marble) w/smooth cut surfaces.

Structural Backup Wall

Adhered natural stone veneer is an attractive wall covering, but it is the structural backup behind the stone veneer that does all the work in resisting loads. The backup wall may be wood framing, steel framing, concrete block, or poured in place concrete.

With adhered applications, the stone veneer will move with the backup wall as the structure responds to loads, temperature variations, and soil settlement. Natural stone veneer is relatively stiff, and is well-matched to a concrete block or poured in place concrete backup system. Wood and steel framing, on the other hand, are relatively flexible. Choosing a stiff backup structure can help to prevent future cracking of the adhered veneer. Wood framing is particularly susceptible to movement as the wood swells during damp periods, and shrinks when it dries.

Narrow cracks in the mortar may appear over time as the backup wall moves. Water that gets in these cracks can cause premature failure. Slight cracks that appear due to this movement usually do not threaten the integrity of the stone veneer, but the cracks should be pointed with new mortar to keep moisture out of the wall system.

Special Challenges

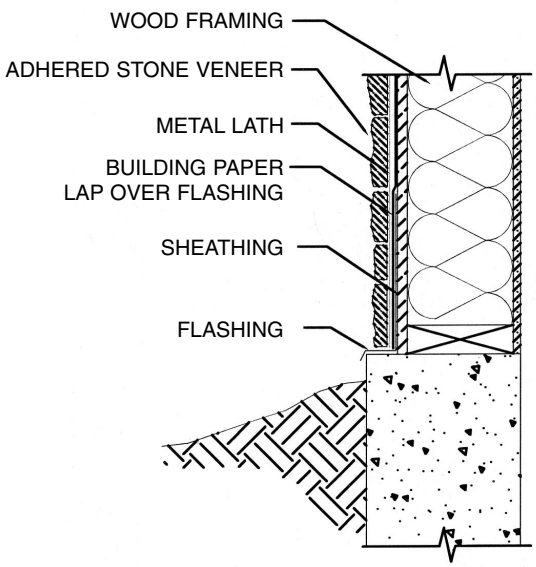
Stone veneers used to face retaining walls, around swimming pools, and in the splash zone near roadways will all need special care in detailing and installation. Provide adequate drainage and damp-proofing.

Wall caps require special attention. The many exposed mortar joints at the top of a wall are prone to moisture penetration, hastening deterioration of the cap. To keep water from running down into the wall under the cap, use through-wall flashing with weep holes directly beneath the wall cap. Even better, use a precast concrete or monolithic stone cap.

De-icing salts are a common cause of efflorescence, scaling, and corrosion of metal lath. Efflorescence may arise in the splash zone, or at the entry to a building; stone can wick salt-rich moisture from adjacent sidewalks or paving areas.

Flashing/Water Penetration

Masonry veneers are water-resistant, not waterproof, no matter how well they are built. They do a good job of resisting moisture penetration, but require a moisture-resistant covering at the face of the backup wall to prevent water damage. Install building paper as a moisture barrier on top of the sheathing over wood or steel stud walls. Concrete block and poured-in-place concrete are both sufficiently water-resistant. They require no moisture barrier. Use flashing at the base of walls, at sills, and under wall caps to direct any moisture to the exterior face of the wall.



Movement Joints

Natural stone is relatively stable and will not move of its own accord. All buildings move slightly over time in response to applied loads, foundation settlement, traffic vibrations, and changes in temperature and humidity. This movement can sometimes cause cracks to appear in the veneer unless movement joints are incorporated into the design.

Typical locations for movement joints include:

- near building corners
- at window and door openings (use a movement joint at one side of an opening 6 to 12 feet wide; openings over 12 feet wide need a joint at each jamb)
- where the stone veneer meets another material such as siding or stucco
- about 35 feet on center for large walls without openings

Movement joints should be flexible. Leave a $^{3}/_{8}$" gap through the veneer and fill with backer rod and sealant.

Efflorescence

Efflorescence is a white, powdery deposit that sometimes appears on the face of masonry walls. Natural stone rarely shows this chalky deposit while manufactured stone, which is made using cement, is very absorbent and often shows efflorescence. You may see a slight efflorescence from the mortar joints if the veneer is installed in an area that occasionally gets saturated. Efflorescence normally is not harmful but serves as an indicator of excessive moisture exposure. Remove powdery deposits by brushing; harder carbonate deposits may require scrubbing with a weak acid dissolved in water. Eliminate the source of the moisture and efflorescence will not recur.

Scuffing

Since natural stone is a homogenous material, the color is consistent throughout the stone. It is much less prone to scrapes and scuffs than manufactured stone that has a thin, pigmented exterior. For small scrapes and scuffs, first try simple cleaning or scrubbing to hide the scuff. You can also use a hammer and chisel to resurface the stone, restoring the original surface texture.

Water Repellents

Most natural stone veneer applications are inherently weather-resistant and do not need treatment over time. There are some instances, however, when water repellent treatments will help the wall resist moisture penetration and staining. It may be wise to apply water repellent at areas that are prone to constant wetting, such as at the base of walls, sills, and caps. Be sure to use a breathable water repellent with a silane or siloxane base. These products penetrate into the surface of the veneer to shed water, while allowing water vapor from within the wall to escape. Avoid elastomeric, silicon or acrylic sealers that form a film at the wall surface. Non-breathable films can actually trap water in the wall, leading to long-term damage.

Durability and Maintenance

Natural stone has very low absorption, high strength, and excellent resistance to weathering, and it will give you long-lasting performance if you follow a few simple guidelines:

- Keep excess moisture from saturating the wall. Adjust landscape sprinklers, downspouts, etc., to prevent water from constantly wetting the wall.
- Periodically remove any vegetation such as ivy or moss.
- Clean with a gentle water spray to remove dust and dirt. If you have stains, graffiti, or other serious cleaning issues, use gentle methods to avoid damaging the mortar and stone. Talk to your local stone supplier for the best recommendations on cleaning solutions. Test any cleaning solution on a small area to check for results.
- Cracks may appear over time as the building shifts and settles. Repoint cracks with new mortar to restore the wall's natural weather resistance.

See Table 1 for natural and manufactured stone property comparisons.

TABLE 1. NATURAL AND MANUFACTURED STONE PROPERTY COMPARISON

Stone Type	Min. Compressive Strength[2], psi	Max. Water Absorption by Weight[2], %	Thermal Expansion[3], in/100°f/10ft	Shrinkage (-) and Expansion (+)[4], in/10ft	Freeze-Thaw Durability
Natural Stone[1]	1,800 to 20,000	0.2 to 12	0.0264 to 0.0804	(+) 0.00048 to 0.012	Good to Excellent
Manufactured Stone	1,500	13 to 29	0.0432 to 0.0744	(-) 0.054 to 0.084	Poor

[1] Natural Stone includes Sandstone, Limestone, Marble and Granite

[2] ASTM Requirement values for Natural Stone; ICC Acceptance Criteria for Artificial Precast Stone Veneer; Max. Density for all veneer is 15 psf per UBC/IBC

[3] Expansion in inches per 10 ft section for a 100° F temperature increase. "Conservation of Historic Stone Buildings and Monuments," National Materials Advisory Board for Natural Stone; "Reinforced Concrete : Mechanics and Design," James G. MacGregor for Concrete (Manufactured Stone)

[4] Shrinkage and Expansion in inches per 10 ft section. Natural stone usually expands over time due to moisture uptake; manufactured stone always shrinks over time due to drying and carbonation.

Building Code Requirements

Adhered natural stone veneer can be installed using a variety of methods for exterior and interior walls. The installation methods recommended in this Guide have proven to be sound and effective in the severe weathering climate of Colorado.

Shown on the next three pages are examples of common installation methods based on requirements of the 1997 Uniform Building Code (UBC) and the 2003 International Building Code (IBC). The IBC references Building Code Requirements for Masonry Structures, ACI 530-02/ASCE 5-02/TMS 402-02, and Specification for Masonry Structures, ACI 530.1/ASCE 6/TMS 602. Since standards, codes, and conditions vary and are sometimes contradictory, contact your local Masonry Institute or building department to determine which method is best for your project.

Material Requirements

Weather-Resistive Barrier

(Only required for Steel or Wood Studs with Sheathing for Exterior Uses)

1997 UBC – All weather-exposed surfaces need a weather-resistive barrier to protect the interior wall covering. This barrier shall be equal to the strength and durability described by UBC Standard 14-1 for waterproof building paper or asphalt-saturated rag felt (tar paper). The building paper or felt needs to be free from holes and breaks other than those created by the fasteners. It needs to be applied in horizontal strips over sheathing. The overlap for horizontal joints is a minimum of 2 inches, and for vertical joints is a minimum of 6 inches.

ACI 530-02/ASCE 5-02/TMS 402-02 – Exterior Veneer is required to have a backing system that resists water penetration. This means that the exterior sheathing needs to be covered with a water-resistant membrane unless the sheathing is water-resistant and the joints are sealed.

Metal Lath and Fasteners

1997 UBC – Exterior Lath – All lath and lath attachments shall be of corrosion-resistant[1] material. The type and weight of metal lath, gage and spacing of wire in welded or woven lath, the spacing of supports, and the methods of attachment are given in Tables 25-B and 25-C *(see pp.10 & 11 of this Guide)*. Metal lath or wire fabric shall be applied horizontally and furred out from backing a maximum of $1^1/_4$". Metal lath needs to be lapped at least $^1/_2$" for horizontal joints and at least 1" for vertical joints. Wire fabric lath needs to be lapped at least 1" for both horizontal and vertical joints.

ACI 530-02/ASCE 5-02/TMS 402-02 – Backing shall provide a continuous, moisture-resistant surface to receive the adhered veneer. Backing is permitted to be concrete block, concrete, or metal lath and Portland cement plaster applied to masonry, concrete, steel framing, or wood framing.

Mortar

1997 UBC – *In lieu of another approved method, one of the following installation methods may be applied:*

1. Brush a paste of neat Portland cement on the backing and on the back of the veneer unit. Then apply Type S mortar to the backing and to the veneer unit. Sufficient mortar shall be used to create a slight excess to be forced out the edges of the units. The stones shall be tapped into place so as to completely fill the space between the stones and the backing. The resulting thickness of mortar in back of the units shall not be less than $^1/_2$" or more than $1^1/_4$".

Or

2. The setting bed of mortar shall be a minimum of $^3/_8$" thick and a maximum of $^3/_4$" thick. A paste of neat Portland cement or one half Portland cement and one half graded sand shall be applied to the back of the exterior veneer units and to the setting bed, and the veneer shall be pressed and tapped into place to provide complete coverage between the mortar bed and veneer stone.

ACI 530-02/ASCE 5-02/TMS 402-02 - Adhesion developed between adhered veneer units and backing shall have a shear strength of at least 50 psi based on gross unit surface area when tested in accordance with ASTM C 482, or shall be adhered in compliance with Article 3.3 C of ACI 530.1/ASCE 6/TMS 602.

ACI 530.1/ASCE 6/TMS 602

3.3 C. *Placing adhered veneer*

1. Brush a paste of neat Portland cement on the backing and on the back of the veneer unit.
2. Apply Type S mortar to the backing and to the veneer unit.
3. Tap the veneer unit into place, completely filling the space between the veneer unit and the backing. Sufficient mortar shall be used to create a slight excess to be forced out between the edges of the veneer units. The resulting thickness of the mortar in back of the veneer unit shall not be less than $^3/_8$" nor more than $1^1/_4$".
4. Tool the mortar joint with a round jointer when the mortar is thumbprint hard.

[1] "Corrosion-resistant" are materials that are inherently rust resistant or materials to which an approved rust-resistive coating has been applied either before or after forming or fabrication. For galvanizing requirements, see ASTM A 153 Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

Building Code Requirements

(continued)

Stone Dimensions and Area

1997 UBC – For veneer units weighing less than 3 pounds per square foot, there is no limit on its dimensions or area. Veneer units may not weigh more than 15 pounds per square foot. For veneer units between 3 and 15 pounds per square foot, the following dimension and area restrictions apply. No side of the veneer units can exceed 36 inches in length and the overall face area of the stone may not be greater than 720 in^2.

ACI 530-02/ASCE 5-02/TMS 402-02 - The maximum thickness of adhered veneer units can be $2^5/_8$". No side of the veneer unit can exceed 36 inches in length and the overall face area of the stone may not be greater than 5 ft^2. Adhered veneer units can not weigh more than 15 pounds per square foot.

TABLE 25-B[1] – TYPES OF LATH – MAXIMUM SPACING OF SUPPORTS *(adapted from 1997 UBC)*

Type of Lath[2]	Minimum Weight Gage and Mesh Size *(per square yard)*	Vertical *(inches)*			Horizontal *(inches)*	
			METAL		WOOD or CONCRETE	METAL
		WOOD	Solid Plaster Partitions	Other		
Expanded metal lath (diamond mesh)	2.5	16[3]	16[3]	12	12	12
	3.4	16[3]	16[3]	16	16	16
Flat rib expanded metal lath	2.75	16	16	16	16	16
	3.4	19	24	19	19	19
3/8" rib expanded metal lath	3.4	24	24[5]	24	24	24
	4.0	24	24[5]	24	24	24
Sheet lath	4.5	24	[5]	24	24	24
Wire fabric lath Welded	1.95 lbs, 0.120 inch (No. 11 B.W. gage), 2"x 2"	24	24	24	24	24
	1.16 lbs, 0.065 inch (No. 16 B.W. gage), 2"x 2"	16	16	16	16	16
	1.4 lbs, 0.049 inch (No. 18 B.W. gage), 1"x 1"[6]	16[4]	-	-	-	-
Wire fabric lath Woven	1.1 lbs, 0.049 inch (No. 18 B.W. gage), $1^1/_2$" hexagonal[6]	24	16	16	24	16
	1.4 lbs, 0.058 inch (No. 17 B.W. gage), $1^1/_2$" hexagonal[6]	24	16	16	24	16
	1.4 lbs, 0.049 inch (No. 18 B.W. gage), 1" hexagonal[6]	24	16	16	24	16

[1] For fire-resistive construction, see Tables 7-A, 7-B and 7-C. For shear-resisting elements, see Table 25-I.
[2] Metal lath and wire fabric lath used as reinforcement for cement plaster shall be furred out away from vertical supports at least $^1/_4$". Self furring lath meets furring requirements.
[3] Span may be increased to 24 inches with self-furred metal lath over solid sheathing assemblies approved for this use.
[4] Wire backing required on open vertical frame construction except under expanded metal lath and paperbacked wire fabric lath.
[5] May be used for studless solid partitions.
[6] Woven wire or welded wire fabric lath not to be used as base for gypsum plaster w/out absorbent paper backing or slot-perforated separator.

TABLE 25-C – TYPES OF LATH – ATTACHMENT TO WOOD AND METAL[1] SUPPORTS *(adapted from 1997 UBC)*

Type of Lath	NAILS[2,3]			SCREWS[3,4]		Wire Gage No.	STAPLES[3,5] *(Round or Flattened Wire)*			
	Type and Size	Max. Spacing[6]		Max. Spacing[6]					Max. Spacing[6]	
		Vert.	Horiz.	Vert.	Horiz.		Crown	Leg	Vert.	Horiz.
		(inches)					*(inches)*			
Diamond Mesh expanded metal lath and flat rib metal lath	4d blued smooth box 1 1/2"[7] No. 14 gage 7/32" head (clinched)[8]	6	-							
	1" No. 11 gage 7/16" head, barbed	6	-	6	6	16	3/4	7/8	6	8
	1 1/2" No. 11 gage 7/16" head, barbed	6	6							
3/8" rib metal lath and sheet lath	1 1/2" No. 11 gage 7/16" head, barbed	6	6	6	6	16	3/4	1 1/4	At ribs	At ribs
3/4" rib metal lath	4d common 1 1/2" No. 12 1/2 gage, 1/4" head	At ribs	-	At ribs	At ribs	16	3/4	1 5/8	At ribs	At ribs
	2" No. 11 gage 7/16" head, barbed	At ribs	At ribs	At ribs	At ribs	16	3/4	1 5/8	At ribs	At ribs
Wire fabric lath[9]	4d blued smooth box (clinched)[8]	6	-			16	3/4	7/8	6	6
	1" No. 11 gage 7/16" head, barbed	6	-			16	3/4	7/8	6	6
	1 1/2" No. 11 gage 7/16" head, barbed	6	6	6	6					
	1 1/4" No. 12 gage 3/8" head, furring	6	6			16	7/16[9]	7/8	6	6
	1" No. 12 gage 3/8" head	6								

[1]Metal lath, wire lath, wire fabric lath and metal accessories shall conform to approved standards.

[2]For nailable nonload-bearing metal supports, use annular threaded nails or approved staples.

[3]For fire-resistive construction, see Tables 7-B and 7-C. For shear-resisting elements, see Table 25-I. Approved wire and sheet metal attachment clips may be used.

[4]Screws shall be an approved type long enough to penetrate into wood framing not less than 5/8" and through metal supports adaptable for screw attachment no less than 1/4".

[5]With chisel or divergent points.

[6]Maximum spacing of attachments from longitudinal edges shall not exceed 2 inches.

[7]Support braced 24" on center. Four attachments per 16-inch-wide lath per bearing. Five attachments per 24-inch-wide lath per bearing.

[8]For interiors only.

[9]Attach self-furring wire fabric lath to supports at furring device.

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686 Mariposa Street
Denver, CO 80204
303-893-3838
www.rmmi.org

1845 W. Dartmouth Avenue
Denver, CO 80110
303-783-3000
www.robinsonbrick.com

Atkinson-Noland & Associates, Inc.

2619 Spruce Street
Boulder, CO 80302
303-444-3620
www.ana-usa.com