June 2024

Installation Guide

| www.eliteazure.com | 850-738-9050

EliteAzure LLC

Disclaimer

This document is intended to serve as a guideline for the installation of thin adhered 1/8'' stone veneer panels. The use of this guideline with respect to other veneer types and installation methods is not recommended. **EliteAzure LLC** takes no responsibility for any installation or installer which references this manual for any other type of veneer system.

Information contained in this document was obtained from ASTM, Masonry Structures Joint Committee, Marble Institute of America, International Building Code, and NBCC codes and standards. The information contained herein is, to the best of **EliteAzure LLC** knowledge, accurate and relevant. Due to the nature of the codes and standards, information in this manual is subject to change. **EliteAzure LLC** assumes no responsibility for errors or omissions contained in the information provided by such codes and standards. Review and follow local building codes and standards as they take precedence over this document. This document should only be used as a guideline alongside applicable building codes and standards. This document is to be used as a guideline for competent and experienced installers of adhered veneer. **EliteAzure LLC** takes no responsibility for the integrity and stability of any installation of adhered stone. Installers and designers of adhered veneer following and referencing this guideline assume all liability for the design and installation of the adhered veneer system. All references to specific suppliers and brands of any product mentioned in this manual are intended to provide guidance and examples of applicable products. **EliteAzure LLC** does not endorse the use of any products mentioned in this manual. All products and materials used for the installation of adhered veneer are to be specified by competent and qualified persons. The drawings and details in this manual are intended to be used as illustrations only, and are not to be used as to scale representations of details to be used in technical drawings or designs. **EliteAzure LLC** takes no responsibility for any person using details referenced in this manual as scale drawings. **EliteAzure LLC** is not liable for any injury or damages caused by the installation of adhered veneer systems at any point the life span of the adhered veneer system.

Building Code Requirements : All applicable building codes and safety procedures for the project must be followed. Project safety is not addressed in these guidelines. It is the responsibility of the project management to ensure that all appropriate safety procedures are followed for the project.

IMPORTANT INFORMATION : This document is written for the purposes of providing general guidelines for the installation of ELITEAZURE LLC , Travertine thin stone veneer. It is not intended as a specific or all-inclusive set of instructions. ELITEAZURE LLC and its affiliates do not make any expressed or implied warranty or guarantee regarding the information and procedures provided in this guide. Various projects or circumstances may require methods or procedures not addressed in this guide. Alternative methods and/or materials may be required due to project specifications, requirements, or conditions. Installers should consult local building codes to ensure compliance. It is the responsibility of the installer to consult applicable project professionals (architects, designers, engineers, etc.) to determine ultimate applicability of this guide to any project and ensure that all building codes (local, regional, national, or international) are followed. ELITEAZURE LLC and its affiliates cannot be held liable for any information contained herein. The installation procedures for Travertine thin stone veneer are extremely similar to the procedures for manufactured stone veneers.

What is Travertine Thin Stone Veneer?

Architectural travertine stone veneer is a **Non- structural**, Decorative finish material only. **Installed over code-approved exterior wall system** with Polymer Modified mortar Type S . Travertine Stone veneer is known for it's Durability and long -lasting performance. When properly applied and maintained, it can withstand harsh weather conditions.

Project Planning

Estimating Quantities Needed Flats are measured by the square foot. To calculate the square footage of an area, multiply the length (in feet) by the width (in feet). Subtract the area of any sections that will not be covered with stone veneer (such as windows & doors) to calculate the square footage needed for the project. Corners are measured by the lineal foot. This is measured as the actual height of the corner requiring coverage. Since corners will cover some of the surface area of the wall, it is recommended to subtract 0.5 square foot from the quantity of flats for each lineal foot of corners. Depending on the installer and application, a small percentage of waste may be required to sufficiently cover the job. 5-10% is considered an acceptable amount of waste. Unlike full thickness veneer, thin veneer stone panels does not need to be mechanically anchored to the backup structure. Instead, adhesion alone is considered to be solely sufficient to transfer the loads. Typical adhesion materials for thin stone veneer are mortar and Construction adhesive for thin stone veneers.

PROPERTIES OF THIN STONE VENEER

Travertine stone panels are made from 100%natural stone powder, and fiberglass mesh materials and similar installation processes as other brick veneers but are thinner and weight less. Thin stone veneer are a single element among many within an adhered veneer system that influence its characteristics. System performance can be accurately determined only when an assembly is evaluated as a whole.

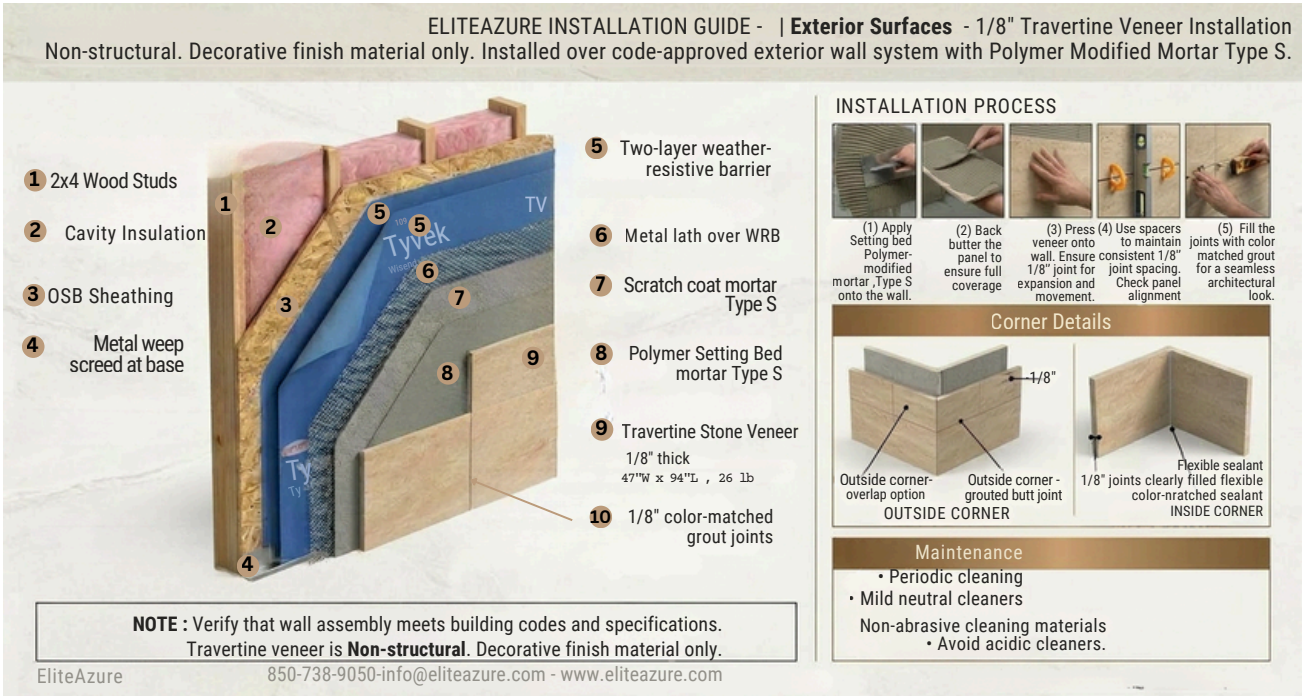
Adhered stone veneer can be installed where providing support for heavier, anchored brick veneer may be difficult.
Thin stone systems also impart less load to buildings. Adhered thin stone veneer may be installed by masons, tile setter or other workers.

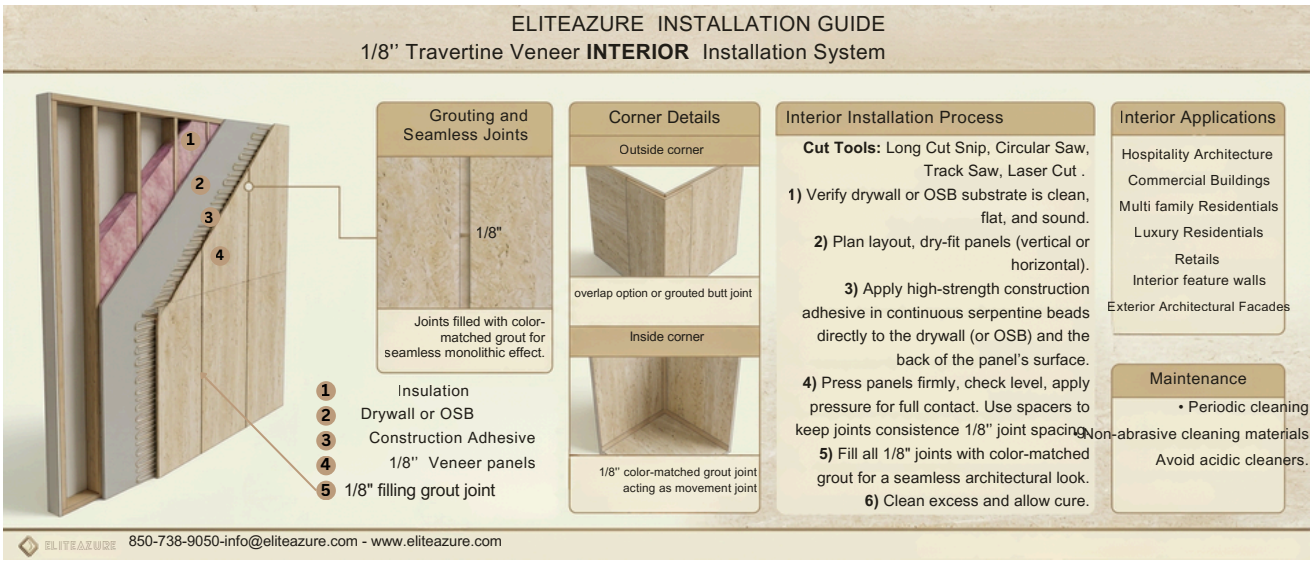
SYSTEM DESCRIPTIONS

Adhered veneers bonded to and dependent upon its backing for stability and strength. This bond is achieved by embedding the thin stone veneer in a modified mortar setting bed, applying an adhesive or modified mortar and pressing the thin stone veneer onto a panel substrate material, or by casting concrete onto the backs of thin stone veneer. Thin stone veneer can be applied either on-site or off-site.

INSTALLATION

The following sections provide recommended procedures for installing thin stone veneer. Installation of mortar in thin stone veneer applications should be scheduled when temperatures will be between 40 °F (4 °C) and 90 °F (32 °C). Otherwise, cold or hot weather construction measures, as described in *Technical Note* 1, should be employed.





Substrate and Surface Preparation

Where thin stone veneer units are installed on site, proper construction and preparation of the substrate to receive them is critical. Surfaces receiving thin stone veneer panels should be structurally sound and free of loose or deleterious debris or residue, including algae, mold, dust, laitance, paste, wallpaper or laminate. Remove all substances that could potentially impede the bonding of the veneer. Such substances include oils, greases, waxes, bond-release agents, sealers, solvents, paints or other coatings or surface preparations. If a substrate surface is wet, then the water source must be identified and eliminated. Surfaces on which thin stone veneer are placed must not vary from plane by more than ¼ in. in 10 ft (6 mm in 3.05 m). Taping sheathing joints or fastening sheathing edges with plywood clips can sometimes reduce unevenness. If a surface does not comply with surface tolerances, then a leveling coat must be applied before proceeding. Walls of wood and steel stud framing should be designed to meet lateral deflection requirements. Exterior walls of wood or steel stud framing require a water-resistive barrier on sheathing. Fasten cement board through sheathing and water-resistive barrier into studs. Joints of cement board should be staggered and offset from sheathing joints. Treat cement board joints with alkali-resistant glass fiber mesh tape embedded in mortar or modified mortar in accordance with cement board manufacturer recommendations. Allow masonry and concrete substrates to cure for **28 days** prior to installation of thin stone veneer.

SYSTEM DESIGN

For residential applications, the *IRC* [Ref. 2] requires thin stone adhered veneer to be installed over a water- resistive barrier and to comply with the adhered veneer provisions of the *Building Code Requirements for Masonry Structures* (TMS 402/ACI 530/ASCE 5) [Ref. 5]. For commercial construction, the *IBC* [Ref. 1] also requires thin stone veneer adhered veneer to meet the requirements of TMS 402.

TMS 402 allows both prescriptive and alternate methods of design. Prescriptive design requirements limit the specified thickness of the stone to a maximum of 2 in. (67 mm) and require the substrate to be masonry, concrete or metal lath and Portland cement plaster applied to masonry, concrete, steel framing or wood framing. If other than ⅜ in. to 1¼ in. (10 to 32 mm) of Type S mortar is used to adhere the thin brick, then the shear strength between the veneer units and backing should be tested in accordance with ASTM C482 for the gross unit surface area and have a shear strength of 50 psi (345 kPa) minimum.

Water-Resistive Barrier and Means of Drainage

The *IRC* and *IBC* require exterior walls to include a water-resistive barrier and a means of draining exterior water that enters the assembly, with a few exceptions. The water-resistive barrier must be installed over the sheathing or studs of frame wall assemblies but may be omitted over concrete or masonry walls designed and flashed in accordance with applicable code requirements. Exterior wall assemblies that demonstrate resistance to wind- driven rain through testing in accordance with ASTM E331 under code-prescribed conditions are also exempt from water-resistive barrier and means-of-drainage requirements.

The code indicates that a water-resistive barrier can be either one layer of No. 15 asphalt felt complying with ASTM D226, Type 1, or other approved material. As noted in the *2009 IRC Commentary* [Ref. 2], field experience and testing [Ref. 7] have shown that using two layers of building paper in exterior applications of stucco considerably decreases the penetration of moisture. Where installed over wood-based sheathing, the *IRC* and *IBC* require two layers of vapor-permeable water-resistive barrier with a performance equivalent to two layers of Grade D building paper, or a single layer of water-resistive barrier with a water resistance equal to or greater than 60-minute Grade D paper that is separated from the veneer by a designed drainage space or a layer of material that does not absorb water. These codes do not indicate specific materials or methods that qualify as providing a means of drainage; however, products such as drainage mats are often used to meet means-of-drainage requirements. Because they are specifically designed to provide the separation and means of drainage required by code, inclusion of designed drainage spaces or drainage mats is preferred. A water-resistive barrier is not required for interior applications but may be beneficial in protecting building materials from moisture during installation. For further information, refer to the *IBC* [Ref. 1] and *IRC* [Ref. 2].

Flashing/Weep Screed

Flashing is a material that collects water drained from the veneer assembly and directs it out of the wall through weeps. Building codes require flashing and weeps at the following locations:

Beneath the first course of veneer above final grade. The *IRC* requires the flashing (or weep screed) to extend a minimum of 1 in. (25 mm) below the foundation plate line for exterior applications over stud walls. To promote drainage, install the first course of veneer directly above the flashing or screed, without a mortar/grout joint.

At points of support, such as shelf angles, lintels and structural floors.

At wall and roof intersections.

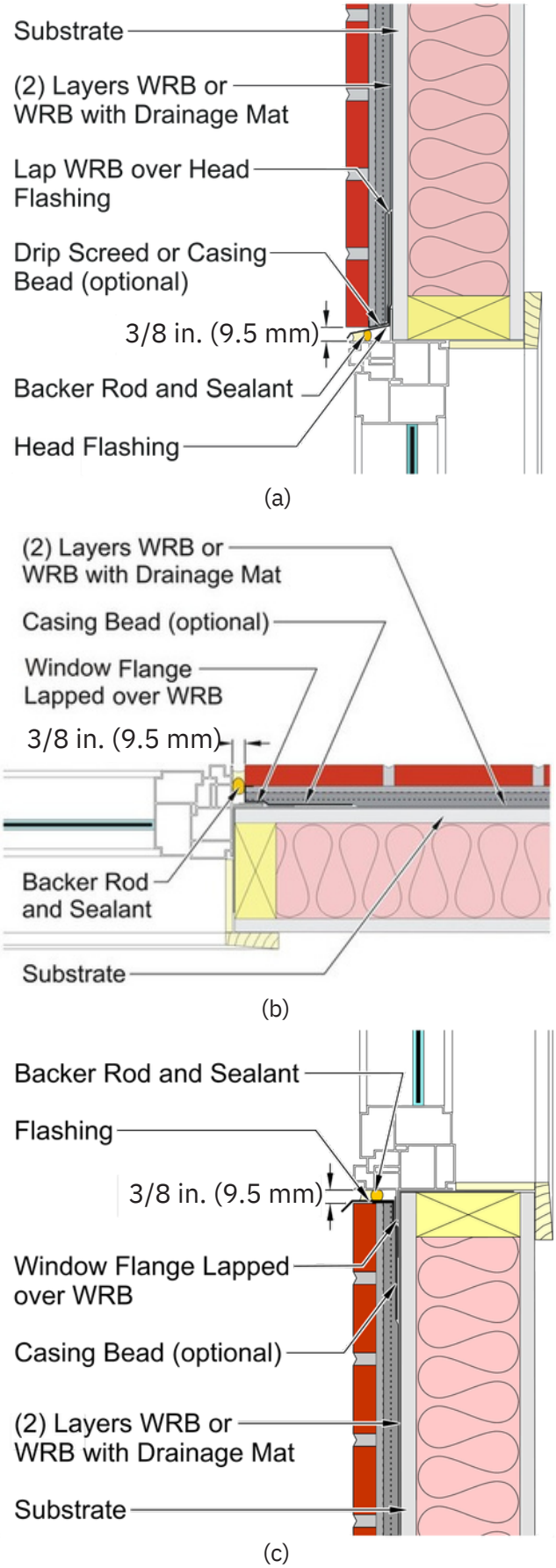


Figure 5

Flashing Details at (a) Window Head, (b) Window Jamb and (c) Window Sill

- At the heads, jambs and sills of exterior
- window and door openings.
  At the intersection of chimneys or other masonry construction with frame or stucco walls.
- Under and at the ends of copings and sills.
- Where exterior porches, decks or stairs attach to a wall or floor assembly of wood or steel stud construction.

The flashing or weep screed should extend to the exterior wall surface or beyond, with the back edge (attachment flange) turned up at least 3½ in. (89 mm) vertically. The water-resistive barrier should lap over the flashing or weep screed. In assemblies with two layers of water-resistive barrier installed over a wood-based sheathing, direct the flashing between the layers. Extending flashing beyond the wall surface to form a drip is recommended. When using a flashing that deteriorates with UV exposure, a separate drip edge or weep screed can accomplish this. When a drip edge/weep screed is not used, such flashings should stop, or be cut, flush with the face of the wall. Typical head, jamb and sill flashing details are shown in Figure 5.

Foundations

Figure 6 shows a typical foundation detail for thin stone veneer. The *IRC* and *IBC* require exterior applications of thin stone veneer over stud walls to be installed a minimum of 4 in. (102 mm) above grade, a minimum of 2 in. (51 mm) above paving, and a minimum of ½ in. (12 mm) above exterior walking surfaces supported by the same foundation. The thin stone are required to extend a minimum of 1 in. (25 mm) below the top of a concrete or masonry foundation wall.

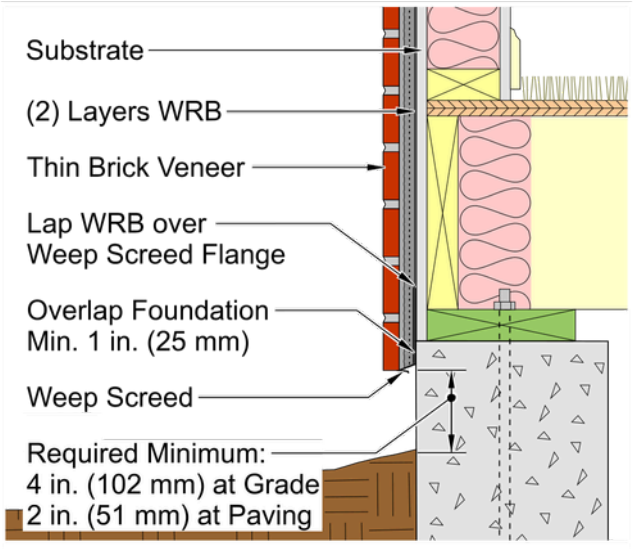


Figure 6

Foundation Detail and Required Clearances

Deflection

For thin stone veneer with a substrate of masonry or concrete, deflection is not a concern, because the flexural stiffness of the veneer is similar to that of masonry and concrete. When the substrate wall is wood or steel stud framing, out-of-plane deflection of the framing must be considered, because the stiffness of the veneer can be substantially greater than the stud framing. The *IBC* limits the deflection of stud framing to a maximum of L/240 when rigid finishes like thin brick are applied. For interior adhered veneer applications supported by wood floors, the *IBC* limits the vertical deflection of the floor system to L/600. To decrease potential cracking and the potential for the veneer to separate from the stud framing, a wall deflection limit of L/360 is recommended when a wood or steel stud framing substrate is used.

Movement Joints

Thin stone veneers may experience differential movement as the stone expand and the substrate or mortar bed shrinks. To accommodate this movement, a system of movement joints should be installed through the entire layer of adhered thin stone veneer. If movement joints are not placed properly or are not used at all, cracking may occur. It is important to note that architectural precast and tilt-up concrete panels that incorporate movement joints where they are joined together usually do not require additional movement joints within the face of the panel. For this type of thin stone veneer installation methods, incorporate movement joints at regular spacings.

Spacing. The distance between movement joints should not be more than 18 ft (5.5 m) either vertically or horizontally. Areas between movement joints should not exceed 144 sq ft (13.4 m²). Veneer areas between movement joints should preferably be square in shape but may have a maximum length-to-height or height-to-length ratio of 2½ to 1. Where thin stone veneer is adhered to a masonry or concrete substrate, the movement joints through the veneer should be installed directly over and aligned with movement joints in the substrate. Where thin stone veneer is installed on studs, the movement joints through the veneer are not necessarily required to be aligned with movement joints through the sheathing on the studs. Where lath or mesh are used, attachment should allow free movement of the veneer between movement joints.

Construction. Movement joints should extend from the exterior surface of the adhered veneer to the substrate beneath the thin stone veneer. Where modular panels are used, construct movement joints in accordance with manufacturer's instructions. Alignment of movement joints with those in the substrate is more easily achieved when they are formed during installation of mortar beds. A compressible filler strip set during mortar placement can provide the space needed for the joint as well as aid in keeping the joint free of mortar or other obstructions. At the exterior surface, a backer rod and sealant prevent water penetration, as shown in Figure 7. Movement joints must be at least as wide as joints in the substrate that they are placed directly over. The minimum recommended width of movement joints through adhered veneer is ⅜ in. (10 mm). In thick set applications, lath or mesh reinforcement should stop on each side and not continue through the movement joint, as shown in Figure 8.

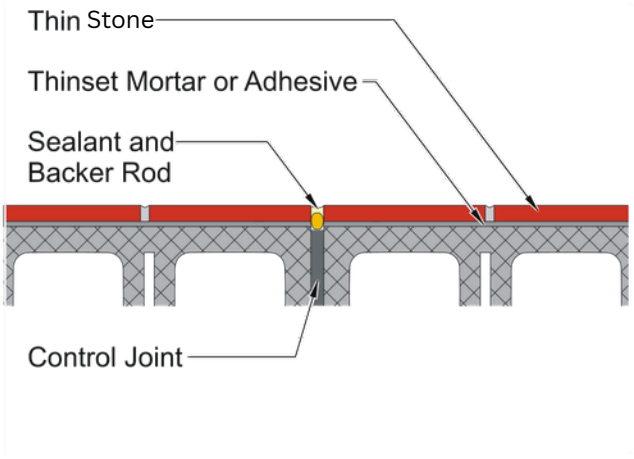


Figure 7 Thin Stone veneer Movement Joints on CMU Backing

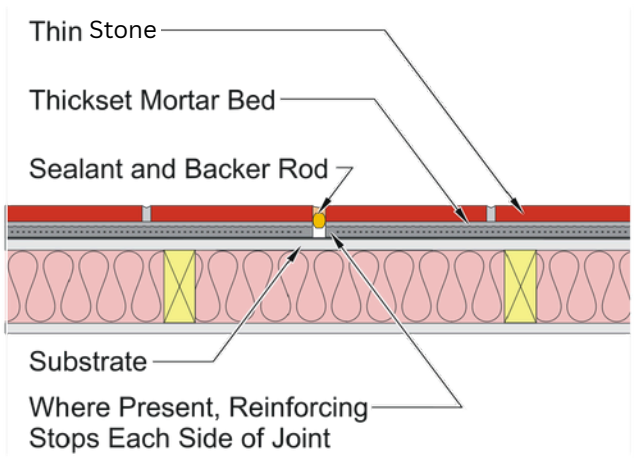


Figure 8 Thin Stone veneer Movement Joints on Stud Backing

Reinforcing Lath and Mesh

Reinforcing lath should be made of corrosion-resistant materials. Galvanized or stainless steel are most common; however other materials such as glass fiber lath may be acceptable with a product evaluation approval. Metal lath should be either 2.5 lb/sq yd (1.4 kg/m²) or ⅜ in. (10 mm) rib, 3.4 lb/sq yd (1.8 kg/m²) metal lath complying with ASTM C847. Self-furred lath or lath attached with self-furring fasteners is recommended. Woven wire mesh should be minimum 18 gauge complying with ASTM C1032. Glass fiber lath should comply with applicable building code requirements. Glass fiber lath is not recommended for applications over open stud framing.

Mortar

Mortar and modified mortar used for scratch and bond coats should comply with ASTM C270, Specification for Mortar for Unit Masonry, Type S, with or without a latex or polymer modifier specifically designed for use with thin veneer; or with ANSI 118.4. Mortar used to fill joints may have a higher water content as required by installation method.

Modified mortar. Typically a modified mortar is a portland cement mortar modified by adding a polymer/latex additive or a bond enhancer. Latex additives may improve adhesion, reduce water absorption and provide greater bond strength and resistance to shock and impact. When using the liquid form of latex, it is added as a replacement for part or all of the water used when mixing the mortar.

Flashing

Many materials are suitable for use as flashing in adhered veneer walls. Flashing materials should be corrosion-resistant,
waterproof, durable and sufficiently toughened flexible so as to resist puncture and cracking. Flashing should also be compatible with other materials in the veneer assembly, such as adhesives and sealants.

Thick Set Method

Metal lath or wire mesh should be applied over the water-resistive barrier and attached with 11 gauge nails 1½ in. (38 mm) in length with a 7⁄16 in. (11 mm) head or 16 gauge staples ⅞ in. (22 mm) in length, spaced at a minimum of 6 in. (152 mm) o.c. Lap the lath or mesh a minimum of 2 in. (51 mm) at sides and ends where sheets are joined. Lap mesh one full mesh, wire to wire, where joined.

Attach lath or mesh to wood stud framing with corrosion-resistant fasteners that penetrate a minimum of 1 in. (25 mm) into the stud. For steel stud framing, use corrosion-resistant screws that extend through the steel stud connection a minimum of three exposed threads. For masonry or concrete, use hardened concrete nails or powder-actuated fasteners that penetrate a minimum of 1 in. (25 mm).

Scratch Coat. For thick set systems, a scratch coat of mortar with a nominal thickness of ½ to ¾ in. (12 to 19 mm) is applied to the lath or mesh until it is fully embedded in the mortar. The scratch coat can be applied in one layer or as two nominal ¼ to ⅜ in. (6 to 10 mm) layers, where the first layer fully embeds the lath or mesh. The surface of each layer should be scratched (scored) horizontally or vertically when thumbprint hard and allowed to cure before applying the next layer or coat. Installation in a single layer may be preferable during periods of hot or cold weather to avoid potential delamination between layers.

Bond Coat. Apply a bond coat of modified mortar over a damp scratch coat to a nominal thickness of ⅛ in. (3.2 mm) and groove with a square-notched trowel. For maximum adhesion, covering the entire back of the thin stone veneer with bond coat mortar is recommended. While the coat remains wet and workable, embed the thin stone into the bond coat and the fill mortar joints .

Setting Thin Stone Veneer

Each thin stone veneer should be firmly pressed or tapped into place, taking care to maintain proper spacing and alignment of the joints and bond pattern. Setting each stone panel with a rubber mallet or a beating block can help to ensure flatness and secure bedding. If modified mortar is used, a slight excess should squeeze out of the joints between the panels during the setting process. Once the thin stone panels is set, it should not be moved or the bond may be compromised. If a thin stone panel is inadvertently moved after initial set has begun, it should be removed, along with any bond coat behind it, and a new thin stone veneer unit installed with fresh mortar, modified mortar or adhesive. Proper setting of each stone veneer panel is critical to ensuring a durable thin stone panel system. Improper setting of the thin stone veneer is the most frequent cause of poor performance.

Photo 2

Mortar Placement Using a Grout Bag

Grouting

If the stone is not being installed in a dry-stacked application, a mortar joint (grout) will need to be added between the stones to complete the installation.

Type S or Type N mortar may be used for grouting. Other mortars may be commercially available for the specific use of grouting stone veneer or natural thin stone veneer. Consult with the manufacturer of these mortars to make sure they are suitable for natural thin stone veneer installation. Iron oxide pigments may be added to the mortar if a colored mortar joint is required. The weight of pigments added should be no more than 10% of the total cement weight. A 12 to 24 hour cure time at 70° F is recommended prior to grouting the stone. Type N and Type S mortar are mixed to the same standards as the scratch coat. This mix is then typically troweled into a pointing (grout) bag. The mix in this bag is then squeezed into the joints and allowed to dry to the point where they can be compressed with a smooth striking tool with no smearing. A striking tool (slicker) is then used to “push” the mortar into the joints, filling in all the voids between the stones and creating the desired finish. There are several different methods for grouting and finishing that can be used for thin stone veneer. Standard Mortar Joint A standard mortar joint is typically raked back (pressed back with a striking tool) to provide relief (variance in depth from the face of the stone to the mortar joint) to the profile of the stone. The level of relief can vary depending on the desired appearance. When raking back the mortar joint, it is important not to remove too much mortar (so as to reveal the scratch coat or create voids). In addition to increasing the beauty of the stone, a mortar joint also helps to keep water from being trapped behind the stones. Overgrout joints are minimally raked to simply fill all the voids behind the stone. They are typically filled fuller during the bagging process and remain nearly flush with the face of the stone when finished. Other Techniques There are many other grouting techniques beyond the scope of this guide, such as beaded, v-joints, etc. For all mortar joint installations, after the joints have been compressed with a striking tool, they often require additional tooling or brushing. This is typically this is done with a dry stiff brush. The amount and timing of the tooling can greatly affect the final appearance of the grout joint. In most applications, tooling and brushing is done when the mortar is nearly dry but still workable and “brushable.

Maintenance

EliteAzure Thin Stone Veneer is a natural stone, very little maintenance is required to maintain its durability. Since it is a natural product, various surface stains may appear over time as a result of the oxidation of minerals that naturally occur in the stone. These stains do not typically detract from the look of the stone and often add to its beauty.

Cleaning It is best to avoid acidic or alkaline cleaners as well as metal brushes. Acids can react with minerals in the stone causing either deterioration or discoloration. A mild detergent and water with a soft bristle brush is usually the best method of cleaning. Always test an area before cleaning. Mortar can usually be easily removed from the stone by brushing it off after it begins to dry (and no longer smears) but before it fully dries. Should efflorescence occur on the mortar (grout) joints, it may be possible to rinse it off with water. If that fails, a solution of 1 part distilled vinegar and 6 parts water may be applied to the mortar joints by gently scrubbing them with a soft bristle brush.

Sealers If a sealer is desired, the sealer used should be breathable. Siloxane based sealers are common for these applications. Consult with the manufacturer of the sealer to confirm that it is suitable for use with natural stone veneer. Always test sealers on a small area or loose piece before applying to the entire job.

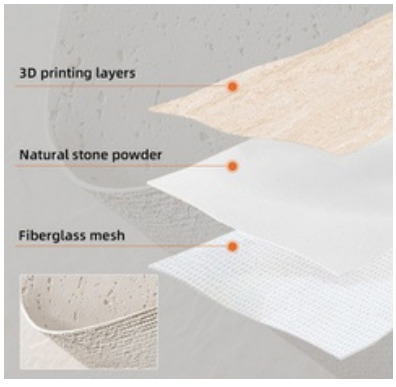
Step 1
Cutting the desire dimensions

Step 2
Adhere it to the mortar surface

Step 3
Firmly pressed or tapped into place

Step 4
Fill in the joints with similar color grout

Step 4
Final Result



COLD AND HOT WEATHER REQUIIREMENTS

For cold weather installations, it is important to prevent the mortar mix from freezing before curing; however, accelerants are not acceptable to use to prevent freezing, as they weaken the bond of the mortar. The only acceptable method to prevent freezing is tenting (or otherwise enclosing) and heating the work area to maintain a temperature within the mortar's workable range until it cures. Heating of sand and water prior to mixing is also helpful to maintain a higher batch temperature. The air temperature in the work area should remain above 32° F during this time, and the stone pieces should be at least 45° F. The typical cure time for most mortars is around 48 hours. Grouting should be done while work area temperatures are 68° F or above. Consult the mortar manufacturer for specific curing details and cure times.

MAINTENANCE

If properly designed, detailed and constructed, minimal maintenance is required for thin stone veneer applications.

Travertine veneer should be inspected periodically to ascertain performance and to identify any potential problems. Inspections are recommended on an annual basis at a minimum. Such inspections should address sealant joints, any loose units, plumbness of the wall, cracking, etc., to identify repairs and corrections before severe issues develop. For additional information regarding maintenance, refer to *Technical Note* 46.

SUMMARY

Thin stone veneer can be installed over a variety of substrates in both exterior and interior applications using thick set, or Construction Adhesive. This *Technical Note* describes thin stone systems currently in use and includes recommendations on the selection, design, materials and installation of each system.

REFERENCES

1. *2012 International Building Code,* International Code Council, Inc., Country Club Hills, IL, 2012.
2. *2012 International Residential Code and Commentary,* International Code Council, Inc., Country Club Hills, IL, 2012.
3. *2013 TCNA Handbook for Ceramic Tile Installation, 50th Anniversary Edition,* Tile Council of North America, Inc., Anderson, SC, 2013.
4. ASTM International, *Annual Book of ASTM Standards,* West Conshohocken, PA, 2013.

   Vol 4.01
   ASTM C847, Standard Specification for Metal Lath
   ASTM C1032, Standard Specification for Woven Wire Plaster Base
   Vol. 4.05
   ASTM C270, Standard Specification for Mortar for Unit Masonry
   ASTM C1088, Standard Specification for Thin Veneer Brick Units Made From Clay or Shale
   ASTM C1325, Standard Specification for Non-Asbestos FIber-Mat Reinforced Cementitious Backer Units

5. *Building Code Requirements for Masonry Structures* (TMS 402-13/ACI 530-13/ASCE 5-13), The Masonry Society, Boulder, CO, 2013.
6. FSC Tech Matters, "Guide to Attaching Exterior Wall Coverings through Foam Sheathing to Wood or Steel Wall Framing," Foam Sheathing Coalition (of the American Chemistry Council), Washington, DC, December 4, 2012, http://fsc.americanchemistry.com/Building-Code/Installation-of-Cladding/Guide-to-Attaching-Exterior-Wall-Coverings.pdf
7. Leslie, Neil P., "Residential Stucco Wall Assembly Moisture Performance Evaluation," *ASHRAE Transactions,* Vol. 114, Part 1, New York, NY 2008.
8. PCI Standard for Embedded Clay Thin Brick, Precast/Prestressed Concrete Institute, Chicago, IL, 2013.