

National Tile Contractors Association

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TileLetter

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On The Cover:
LATICRETE International, Inc.

LATICRETE AND DAL TILE – INSTALLING
SUCCESSFUL MANUFACTURED STONE VENEERS

Photograph courtesy of Dal-Tile Corporation

Manufactured Stone Veneers
New Business for Tile Contractors Nationwide



Manufactured Stone Veneers – New Business for Tile Contractors Nationwide



Figure 1

TYPICAL RESIDENTIAL ADHERED MANUFACTURED STONE MASONRY VENEER INSTALLATION

Introduction

Adhered Manufactured Stone Masonry Veneer (AMSMV) is gaining momentum as a finish material for exterior and interior building cladding. AMSMV is a lightweight manufactured product; cast from cementitious materials that is designed to look like natural quarried stone. AMSMV units are adhered to a structural wall with an adhesive and come in a wide range of finish sizes, facial dimensions, colors and thicknesses. Just look around your community, you will see AMSMV finishes in many applications including building facades, fireplaces, chimneys, columns and free-standing landscaping walls. The acceptance and rapidly growing usage of AMSMV by the design community and building owners alike is a great new way for traditional ceramic tile and dimensional stone installation companies to expand their business opportunities.

Compared to traditional AMSMV installation practices, the products and installation methodology utilized and understood by ceramic tile and dimensional stone installation companies are better suited to the installation nuances and requirements of AMSMV. The following discussion will help us to see why this is the case.

Building Code Considerations

AMSMV falls under the auspices of Chapter 14 Exterior Walls in the 2009 International Building Code (IBC). In addition, further prescriptive requirements of exterior adhered veneer fall under the auspices of Chapter 6 of the Building Code Requirements for Masonry Structures TMS 402-08 / ACI 530-08 / ASCE 5-08; namely section 6.3 – Adhered Veneer.

The Prescriptive Requirements for Exterior Applications Under the Code are as Follows:

1. Units shall have a minimum thickness of 1/4" (6 mm)+ and shall not exceed 2-5/8" (66 mm) thickness
2. Units shall not exceed 36" (914 mm) in any face dimension.
3. Units shall not exceed more than 5ft² (0.46 m²) in total facial area.
4. Units shall not weigh more than 15lbs per ft² (718 Pa) [interior units can weigh up to 20lbs per ft² (0.958 kg/m²)].
5. Units that weigh less than 3lbs per ft² (143 Pa) shall not be limited in facial dimensions.
6. Adhesion developed between the substrate and the adhered veneer shall be a minimum of 50 psi (345 kPa).

+Table 1405.2 – Minimum Thickness of Weather Coverings – Chapter 14 – Exterior Walls – 2009 IBC



Figure 2

INSTALLATION OF AMSMV OVER CONCRETE WALL SUBSTRATE

The 2009 IBC also dictates that backing structures shall be designed to meet the deflection standard of 1/600 under total anticipated load for adhered masonry veneers. It is important to note that the code established deflection standard is utilized in absence of project specific engineered building constructs. Design professionals are empowered to design / engineer the building to lower deflection criteria if deemed appropriate.

Therefore, in many cases, project specifiers have found that the deflection standard of 1/360 under total anticipated load is more practical for finishes such as thin brick, ceramic tile, glass tile and porcelain tile and the deflection standard of 1/480 under total anticipated load is more practical for stone and AMSMV finishes. Consult with the AMSMV manufacturer for more information on deflection requirements.

As with traditional adhered masonry veneer, backup wall constructs consist of concrete, concrete masonry units, wood or steel framed assemblies with fastened lath and plaster systems or cement backer board substrates. Cement backer board applications installed over steel framing in accord with Tile Council of North America Method W-244 (E) is a commonly specified installation system for adhered veneers (see figure 3).

AMSMV INSTALLATION FOLLOWING TCNA W-244(E) METHODOLOGY

Specifiers can use the CSI Master Format section 04 73 00 Simulated Stone (or 04 70 00 Manufactured Masonry) section to reference and specify AMSMV units and installation methodology. Ceramic tile and dimensional stone installation contractors can seek out this additional work in their bids by referring to this section in building specifications when estimating projects. An additional bid can be submitted under this specification section.

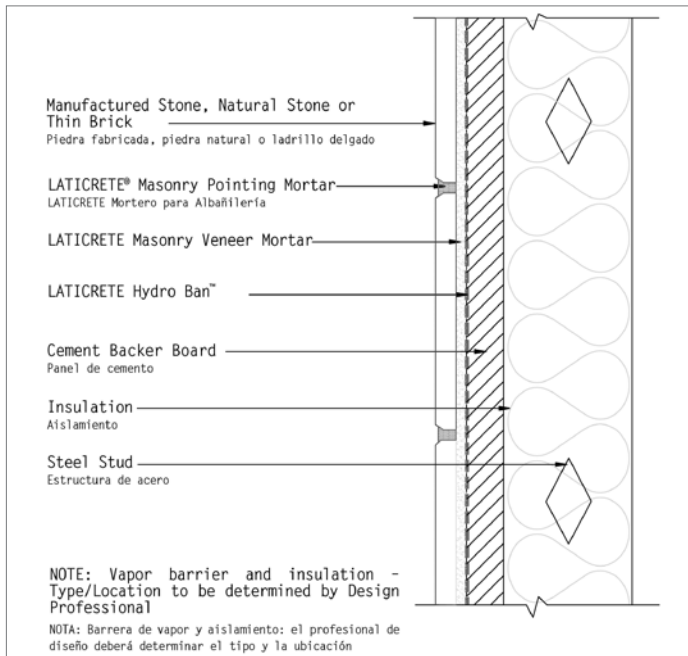


Figure 3

Inform the general contractors, construction managers and architects that you work with that your firm can perform AMSMV work in addition to typical ceramic tile and dimensional stone work. Under certain circumstances, AMSMV work may be bundled with other masonry work specified under section 4. Negotiations with owners / general contractors may be required to carve out this specific section from other masonry work to submit a specific bid for the AMSMV work only. This would be no different than when owners / general contractors bundle all of the flooring finishes together on a project (e.g. carpeting, resilient, laminate, wood, ceramic tile, stone). In many cases, owners / general contractors will allow subcontractors to submit bids on the individual finish types and award work accordingly. Submission and timing of AMSMV bids are also a factor. Typically, division 4 work bids earlier than division 9 work. Therefore, ceramic tile and dimensional stone contractors may need to view, estimate and submit bids for AMSMV work earlier in the construction process.

In addition, ASTM standards are under development for AMSMV units under the oversight of ASTM International Committee C15 on Manufactured Masonry Units; namely subcommittee C15.11 – ASTM WK12802 – New Specification for AMSMV Units.

Traditional Installation Methodology

Until now, AMSMV units have been treated like traditional brick or natural quarried stone and installed with the same type of mortars; Type S or Type N masonry mortars.

Depending on the substrate type, two layers of a weather resistive barrier (e.g. 15 lb builders felt) and galvanized wire lath is fastened to the structure / substrate prior to the installation of the AMSMV units. In many cases, the wire lath is floated with a portland cement based plaster. The plaster is typically applied in a two coat process; scratch coat (~1/2 {12 mm} thickness) and a brown coat (~5/8 {15 mm} thickness).

This traditional method requires that a slurry of neat portland cement mixed with water is brush applied to the back of the units and then bedded into the Type S or Type N mortar (~3/8 {9 mm} mortar thickness after beat in). As the units are tapped into place, the mortar squeezes into the mortar joints and grips the edges of the units. Then additional mortar is placed into the joints and pointed to the desired finish.

Consult with the specific AMSMV manufacturer for complete installation information including flashing, weep screeds, expansion joints and other critical detailing elements.

The Problem

Unfortunately, traditional site mixed masonry mortars fall short in their ability to withstand the demanding conditions that AMSMV typically face – they simply don't have the adhesion strength or durability to withstand the rigors of such an installation. Therefore, many of these installations experience bond failure as the veneer separates from the substrate and eventually falls off the building (see figure 4). In many cases, Type S and Type N masonry mortars do not even achieve the code prescribed shear bond strength requirement of 50 psi (345 kPa). This is due to the fact that Type S and Type N mortars are not designed to achieve high shear bond strength; they are typically used to bed brick, block and stacked stone and therefore, shear bond strength is not one of this mortar's better qualities – it's just not designed for it.



Figure 4

NOT ALL TYPE S OR TYPE N MASONRY MORTARS ACHIEVE / DEVELOP ADEQUATE STRENGTH REQUIRED FOR DEMANDING EXTERIOR AMSMV APPLICATIONS

A major problem is that traditional AMSMV applications typically only use damp-proofing / weather proofing membranes (e.g. 15 lb builders felt) in lieu of true waterproofing membrane products. Therefore, water infiltration is a common problem associated with many AMSMV applications as the damp-proofing / weather proofing membranes are not sufficient to prevent water infiltration. This problem is magnified as the water infiltration also causes freeze / thaw damage in colder climates and thermal expansion problems in warmer climates along with corrosion of the wire lath and its fasteners (see figure 5). The Type S and Type N mortars described above are also susceptible to this damage.

The brief history of AMSMV has demonstrated that more robust installation products and methodology are required. This is where familiarity with installation materials and methodology commonly used by ceramic tile and dimensional stone installation companies comes into play along with proven technology and innovation from LATICRETE.



Figure 5

BOND FAILURE, CORROSION OF WIRE LATH AND WATER INFILTRATION IN TRADITIONAL AMSMV INSTALLATION

The Solution

The LATICRETE® Masonry Veneer Installation System (MVIS) is a solution to all of the problems associated with typical AMSMV installations. Utilizing a combination of our proven materials and methods with innovative new products, LATICRETE provides a complete installation system that offers long-term dependable installations backed by either a LATICRETE 25 Year System Warranty* or a 10 Year System Warranty for Steel or Wood Framed Exterior Facades**).

* See Data Sheet 025.0 for complete warranty information. ** See Data Sheet 230.15 for complete warranty information.



Figure 6

LATICRETE MVIS - FASTER, STRONGER, SIMPLER

Key products in the LATICRETE MVIS include (see figure 6):

LATICRETE® Hydro Ban™

A revolutionary waterproofing and crack isolation membrane that is easy to apply, ICC code approved to replace the inferior builders felt traditionally used on AMSMV installations.

LATICRETE Masonry Veneer Mortar

A polymer-enhanced adhesive mortar that provides exceptional bond strength to the veneer and substrate plus non-sag performance, exceeding ANSI A118.4 and ASTM C270.

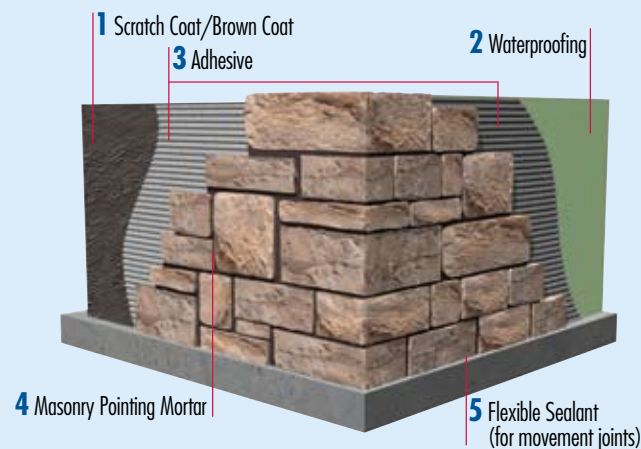
LATICRETE 3701 Fortified Mortar Bed

A polymer-enhanced scratch and brown coat mortar offering easy installation to be used in place of traditional Type S / Type N mortar / plaster.

Other products available in the LATICRETE MVIS include LATAPOXY 310 Stone Adhesive, LATICRETE Masonry



LATICRETE® MASONRY VENEER INSTALLATION SYSTEM



For more information, contact your local LATICRETE Sales Representative.

Figure 7

Pointing Mortar and LATICRETE Latasil™ tile and stone silicone sealant (see figure 7). When combined together, the LATICRETE MVIS provides exceptional performance to the installer.

COMPONENTS OF THE LATICRETE MVIS

The methods of vertical installations of ceramic tile and / or large format stone are familiar to most installers of ceramic tile and stone. The American National Standards Institute (ANSI) – Standards for the Installation Ceramic Tile – ANSI A108 / ANSI A118 along with many of the vertical installation methods outlined in the Tile Council of North America's Handbook for Ceramic Tile Installations provide solid installation methodology and installation materials specification and selection that results in code compliant, permanent, high strength, freeze thaw, thermal, weather and shock resistant installations. Couple this industry experience with the technology and experience of LATICRETE, AMSMV projects will allow for increased sales and entrance into a new segment or category that is growing in popularity across the country.



Progress of an AMSMV installation