



Manufactured Stone Veneer Installation Guidelines



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Masonry Veneer Manufacturers Association

Introducing Masonry Veneer Manufacturers Association

About MVMA

- MVMA represents manufacturers of manufactured stone veneer (MSV) and related suppliers.
- MVMA goal is to help grow the MSV industry through proactive technical and advocacy efforts.
- MVMA members represent majority of MSV industry.

Introducing Masonry Veneer Manufacturers Association





Introducing Masonry Veneer Manufacturers Association



Goals of this presentation

- Present Manufactured Stone Veneer installation guidelines developed by MVMA.
- Address wall preparation; flashing and details of penetrations, joints, transitions, and terminations; and MSV installation.
- Provide update on opportunities.




The Fine Print

- This information is intended to serve as a guideline, and is not intended for any specific construction project.
- The presenters and MVMA makes no express or implied warranty or guarantee of the techniques, construction methods, or materials identified herein.
- Alternative methods or materials may be required or advisable based on project conditions.
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Manufactured Stone Veneer Installation Guidelines

Today's Topics

- Design Considerations
- The Wall
- Water Resistant Barrier
- Flashing
- Lath
- Scratch coat
- MSV Installation
- Finishing & Cleanup
- Maintenance
- Opportunities





Manufactured Stone Veneer

MSV - Description

- Lightweight concrete
- Cast, textured, and tinted to simulate naturally occurring stone
- Offers durability and beauty of natural stone.



Design Considerations

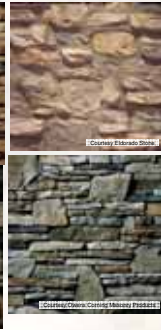
- Aesthetics
- Structural
- Water Management



Design Considerations

Aesthetics

- Select the
 - Round stones
 - Ledgestones
 - Component stones
 - Irregular shapes
 - Combinations
- Joint options
 - 1/2" joint
 - Tight Fit
 - Overgrout



Design Considerations

- Structural
 - Wood framing
 - Metal framing
 - CMU
 - Poured concrete
- Dead load contribution
 - Veneer weighs up to 15 lbs/sq. ft.



Wood frame installation

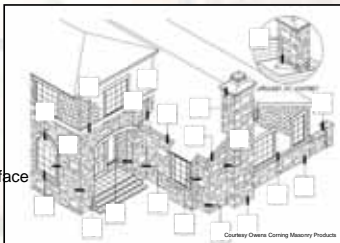


Masonry or Concrete

Design Considerations

Water Management

- Terminations
 - Top, bottom, and sides
- Penetrations
 - Fenestration
 - Utilities
- Transitions
 - Vertical & horizontal
- Roof
 - Cladding / roofing interface
 - Run-off / kick-out
- Unintentional water
 - Lawn sprinklers
 - Groundwater



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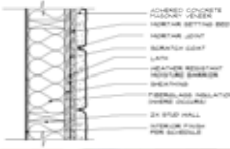
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The Wall

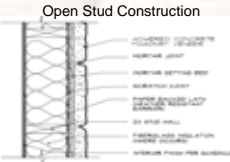
Wood/Metal Framing

- 16 inch on center
- Application methods for sheathed and open stud construction
- Sheathed applications following the APA recommendation for fasteners and gap spacing.

Sheathed Stud Construction



Open Stud Construction



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The Wall

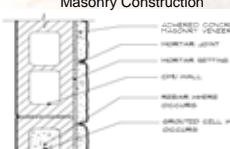
Masonry / Concrete


- CMU
- Poured Walls

The key is surface prep

- Clean
- Rough
- No form release oil
- No paint or sealer

Masonry Construction







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Water Resistive Barrier

- Two separate layers
 - Must provide bond break and drainage between scratch coat and WRB
- Meet ICC-ES AC308
 - Grade D building paper
 - #15 felt (ASTM D226)
 - House wrap
- Install per manufacturer recommendations
 - Vertical and horizontal overlap
 - Fastening

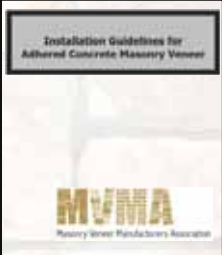
Tyvek
HomeWrap

Courtesy Quality Stone Veneer

www.masonryveener.org

Flashing

- Flashing
 - Terminations
 - Transitions
 - Penetrations
 - Roof Interface



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Flashing

- Flashing
 - Terminations
 - Foundation
 - Transitions
 - Penetrations
 - Roof Interface

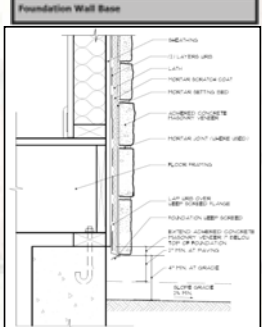


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Flashing


- Flashing
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Flashing

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Flashing

- Flashing
 - Terminations
 - Transitions
 - Vertical transition
 - Penetrations
 - Roof Interface



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Flashing

Flashing

- Terminations
- Transitions
 - Vertical transition
- Penetrations
- Roof Interface

Flashing

Flashing

- Terminations
- Transitions
 - Vertical transition
- Penetrations
- Roof Interface

Flashing

Flashing

- Terminations
- Transitions
 - Horizontal transition
- Penetrations
- Roof Interface

Flashing

Flashing

- Terminations
- Transitions
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- Terminations
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Flashing

Flashing

- Terminations
- Transitions
 - Horizontal transition
- Penetrations
- Roof Interface

Flashing

Flashing

- Terminations
- Transitions
 - Horizontal transition
- Penetrations
- Roof Interface

Wall Assembly

Labels in diagram: EXTENSION FLASH, (2) LAYERS URETHANE, LAP URETHANE OVER SCREED, WEEP SCREED, EXTENDED URETHANE FLASH SHALL BE LAPPED 6" MIN ABOVE GARDEN TABLE, CORROSION RESISTANT FLASHING, PORTLAND SCRATCH COAT, PORTLAND SETTING BED, ADHERED CONCRETE MASONRY VENEER, PORTLAND JOINT (GARDEN USED), LATH, (2) LAYERS URETHANE, INSULATION.

Flashing

Flashing

- Terminations
- Transitions
 - Horizontal transition
- Penetrations
- Roof Interface

Don't Do This

Flashing

Flashing

- Terminations
- Transitions
- Penetrations
 - Windows & doors
 - Sill, jamb, head
- Roof Interface

Courtesy Fibrecrete Stone

Flashing

Flashing

- Terminations
- Transitions
- Penetrations
 - Windows & doors
 - Sill, jamb, head
- Roof Interface

Window Sill

Labels in diagram: WINDOW FRAME PROFILE (PVC, ALUMINUM, STEEL) - REFER TO FRAMA DETAILS FOR INSTALLATION AND FLASHING, BEADING SEALANT UNDER WINDOW PIN, BACKER ROD AND SEALANT, CASING BEAD, SILL FLASHING UNDER WINDOW LIP OVER URETHANE, ADHERED CONCRETE MASONRY VENEER, PORTLAND SETTING BED, PORTLAND JOINT (GARDEN USED), ADHERED CONCRETE MASONRY VENEER, PORTLAND SCRATCH COAT, LATH, URETHANE BALL SAP, INSULATION.

Flashing

Flashing

- Terminations
- Transitions
- Penetrations
 - Windows & doors
 - Sill, jamb, head
- Roof Interface

Window Jamb

Labels in diagram: WINDOW FRAME PROFILE (PVC, ALUMINUM, STEEL) - REFER TO FRAMA DETAILS FOR INSTALLATION AND FLASHING, 2" SIP LATH FLASHING UNDER WINDOW PIN, BEADING SEALANT UNDER WINDOW PIN, (2) LAYERS URETHANE, WEEP SCREED TO FIN, LATH, PORTLAND SCRATCH COAT, PORTLAND SETTING BED, PORTLAND JOINT (GARDEN USED), ADHERED CONCRETE MASONRY VENEER, BEADING SEALANT UNDER URETHANE, CASING BEAD (OPTION: LAP SIP OVER URETHANE), BACKER ROD AND SEALANT.

Flashing

Flashing


- Terminations
- Transitions
- Penetrations
 - Windows & doors
 - Sill, jamb, head
- Roof Interface

Window Head

Labels in diagram: WEATHERING, (2) LAYERS URETHANE, LATH, PORTLAND SCRATCH COAT, PORTLAND SETTING BED, ADHERED CONCRETE MASONRY VENEER, PORTLAND JOINT (GARDEN USED), ADHERED CONCRETE MASONRY VENEER KEY OR TRIT (GARDEN OCCURS), LAP URETHANE OVER SIP AND HEAD FLASHING AND SEAL EDGE, APPROVED DRIP SCREED OR CASING BEAD WITH 3/16" LED AND 3/8" DIA. WEEP HOLES AT 3" ON CENTER, CORROSION RESISTANT HEAD FLASHING SET IN SEALANT (PROFILE VARIES), BACKER ROD AND SEALANT, BEADING SEALANT UNDER WINDOW PIN, WINDOW FRAME PROFILE (PVC, ALUMINUM, STEEL) - REFER TO FRAMA DETAILS FOR INSTALLATION AND FLASHING.

Flashing

- Flashing
 - Terminations
 - Transitions
 - Penetrations
 - Utilities
 - Roof Interface

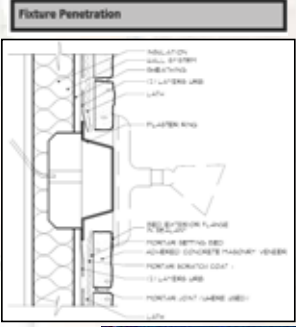


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Flashing

- Flashing
 - Terminations
 - Transitions
 - Penetrations
 - Utilities
 - Roof Interface



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Flashing

- Flashing
 - Terminations
 - Transitions
 - Penetrations
 - Roof Interface

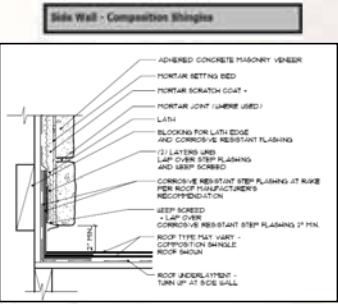


© Courtesy: Boulder Creek Stone

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Flashing

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Flashing

- Flashing
 - Terminations
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© Courtesy: Summit Stone

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Lath

- Lath
 - Selection
 - Installation



© Courtesy: B&B

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Lath

- Lath
 - Selection
 - Corrosion resistant
 - Self-furring
 - Selected based on application.
 - 2.5 lb/yd² or 3.4 lb/yd²
 - ASTM C847
 - ICC ES AC191
 - 18 Gauge Woven Wire
 - ASTM C1032
 - ICC ES AC191
 - Alternative lath
 - ICC ES AC275
 - Installation



Lath

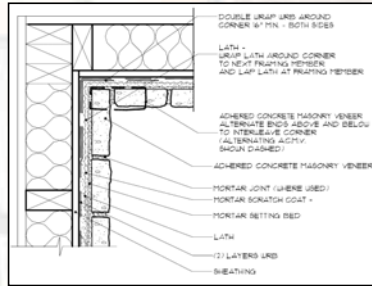
- Lath
 - Selection
 - Installation
 - Inside corners



Lath

Inside Corner

- Lath
 - Selection
 - Installation
 - Inside corners



Lath

- Lath
 - Selection
 - Installation
 - Inside corners



Lath

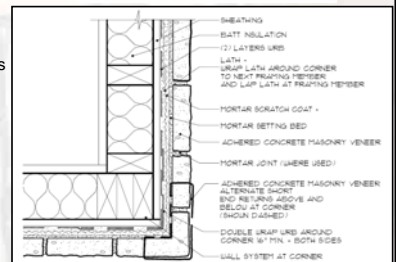
- Lath
 - Selection
 - Installation
 - Outside corners



Lath

Outside Corner

- Lath
 - Selection
 - Installation
 - Outside corners



Lath

Lath

- Selection
- Installation
 - Outside corners

Don't Do This





© Courtesy: Double Creek Stone




Scratch Coat



Scratch Coat

- First application of mortar over the metal lath
- Nominal 1/2" thick
- Encapsulate the lath
- Scored (scratched) in horizontal direction
- Moist cured

© Courtesy: Quality Stone Veneer

© Courtesy: Stone Veneer Products

Veneer Installation

Basics of setting stone

- Mortar types and mix
- Moist scratch coat
- Mortar methods
- The key for success



© Courtesy: Stone Veneer Products






Veneer Installation

Basics of setting stone

- Mortar types and mix
 - Job site mix
 - Premixed
- Moist scratch coat
- Mortar methods
- The key for success


| Mortar | |
|--------|--|
| Mix 1: | <ul style="list-style-type: none"> • 1 part portland Cement (ASTM C 150) • 1 part Lime (ASTM C 207) • 4.5 parts Sand (ASTM C 144) • potable water |
| Mix 2: | <ul style="list-style-type: none"> • 1 part Type S Masonry Cement (ASTM C 91) • 2.25 parts Sand (ASTM C 144) • potable water |
| Mix 3: | <ul style="list-style-type: none"> • 1 part Type N Masonry Cement (ASTM C 91) • 2.25 parts Sand (ASTM C 144) • potable water |
| Mix 4: | <ul style="list-style-type: none"> • Premixed mortars must also meet the above requirements. Check with the mortar manufacturer to determine if their product is suitable for installation manufactured stone veneer and it meets the building code requirement of 50 psi shear bond when tested in accordance with ASTM C 482. |



Veneer Installation

Basics of setting stone

- Mortar types and mix
- Moist scratch coat
 - Not dry, not wet
- Mortar methods
- The key



© Courtesy: Owens Corning Masonry Products

Veneer Installation

Basics of setting stone

- Mortar types and mix
- Moist scratch coat
- Mortar methods
 - Mortar buttered on the back of the stone
 - Mortar troweled on wall
 - Combination
- The key for success



© Courtesy: Stone Veneer Products




Veneer Installation

Basics of setting stone

- Mortar types and mix
- Moist scratch coat
- Mortar methods
 - Mortar buttered on the back of the stone
 - Mortar toweled on wall
 - Combination
- The key for success





Courtesy Tapes Textured Stone
Courtesy Quality Stone Veneer
Courtesy Quality Stone Veneer

Veneer Installation

Basics of setting stone

- Mortar types and mix
- Moist scratch coat
- Mortar methods
- The key for success
 - Full setting bed with squeeze out





Courtesy Owens Corning Masonry Products
Courtesy Owens Corning Masonry Products
Courtesy Quality Stone Veneer

Veneer Installation

Grouted Installation

- Moisten back of MSV
- Back butter MSV
- Firmly press and work the stone / mortar onto the scratch coat
- Allow to cure without disturbance
- Corners first
- Top-down or bottom-up





Courtesy Quality Stone Veneer
Courtesy Quality Stone Veneer
Courtesy Quality Stone Veneer

Veneer Installation

Grouted Installation

- Clean joints when sufficiently cured that mild bump will not affect bond.
- Grout bag for filling joints.





Courtesy Boulder Creek Stone
Courtesy Tapes Textured Stone
Courtesy Tapes Textured Stone

Veneer Installation

Grouted Installation

- Tool joints when thumbprint hard
- Brush for a finished appearance
- Clean the finished project





Courtesy Tapes Textured Stone
Courtesy Quality Stone Veneer
Courtesy Tapes Textured Stone

Veneer Installation

Tight Fit Installation

- Corners first
- Bottom-up
- Moisten and back-butter MSV
- Firmly press and work stone / mortar onto the scratch coat
- Clean when thumbprint hard





Courtesy Owens Corning Masonry Products
Courtesy Owens Corning Masonry Products
Courtesy Owens Corning Masonry Products

Veneer Installation

Basics of setting stone

- Full scratch coat encapsulating lath
- Full mortar setting bed for MSV




Don't Do This

Courtesy Owens Corning Masonry Products

Veneer Installation

Basics of setting stone

- Use corner stones



Don't Do This

Courtesy Owens Corning Masonry Products

Hot or Cold Weather Installation

| | |
|--|---|
| <p>Hot Weather</p> <ul style="list-style-type: none"> • Pay special attention to damp scratch coat and damp MSV units • Provide shade – work in the shade • Frequently mist the wall • Consult mortar manufacturer for recommendations on hot weather mix | <p>Cold Weather</p> <ul style="list-style-type: none"> • Protect from temps below 40 degrees F • Do not use anti-freeze • Do not use calcium chloride • Do not install MSV units that have visible ice or snow on them. • Heat and shelter the installation |
|--|---|


MVMA

Maintenance

Cleaning

- No acid or harsh chemicals
- No abusive tools

No salt or de-icing chemicals



MVMA

Opportunities

- Rain screens, wall drainage systems
- Treatments (details) below clearance to grade
- Insulated concrete forms and SIPs
- Thick foam applications
- 2009 IRC code changes

MVMA

Questions?

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