



**Environmental Stoneworks Corporate Office
6300 East Stapleton Drive South
Denver, CO 80216**

**Phone (303) 309-3040
Fax (303) 309-3059**

www.estoneworks.com

SPECIFICATION GUIDELINE

Environmental Stoneworks specification guideline should be used to assist design professionals in the preparation of projects. Edit and delete items that may not be applicable. Verify all referenced section numbers / titles.

SECTION 04700 - Simulated Masonry (Manufactured Stone Veneer and Trim)

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Manufactured Stone Veneer and Trim
2. Manufactured Brick Veneer and Trim

B. Related Sections:

1. Division 07 Sections for Water-resistive Barriers, Sealants and Flashings.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM); Philadelphia, PA. (215) 299-5420,

1. ASTM C 39 - Test Method for Compressive Strength of Cylindrical Concrete Specimens.

2. ASTM C 67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
3. ASTM C 140 - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
4. ASTM C 144 - Standard Specification for Aggregate for Masonry Mortar.
5. ASTM C 150 - Standard Specification for Portland Cement.
6. ASTM C 207 - Standard Specification for Hydrated Lime for Masonry Purposes.
7. ASTM C 270 - Standard Specification for Mortar for Unit Masonry.
8. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
9. ASTM C 778 - Standard Specification for Standard Sand.
10. ASTM C 847 - Standard Specification for Metal Lath.
11. ASTM C 979 - Standard Specification for Pigments for Integrally Colored Concrete.
12. ASTM C 1059-Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete.
13. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
14. ASTM C 1032 - Standard Specification for Woven Wire Plaster Base.
15. ASTM C 932 - Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering.
16. ASTM C 482 - Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement.
17. ASTM C 348 Standard test Method for Flexural Strength of Hydraulic-Cement Mortars.
18. ASTM F 1667 – Standard Specification for Driven Fasteners, Nails, Spikes & Staples.

B. American National Standards Institute (ANSI); New York, (212) 642-4900,

1. ANSI A118.4 Specification for Latex-Portland Cement Mortar.

C. Building Code Compliance:

1. International Code Council (ICC)

D. US Green Building Council's Leadership in Energy and Environmental Design (LEED)

E. Masonry Veneer Manufacturers Association (MVMA)

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Indicate layout, show profiles and product components, including anchorage, accessories, finish colors, patterns, and textures.
- C. Qualification Data: Environmental Stoneworks manufacturing and installing qualifications, safety and quality documents.
- D. Test Reports: Certified test reports showing compliance with specified performance requirements and physical properties.
- E. Samples: Board containing sample including mortar.
- F. Manufacturer's Instructions: Environmental Stoneworks' Installation Procedures.
- G. LEED Submittals: Contact Environmental Stoneworks for possible contribution to credits.

- H. Certificates: ICC-ES Report 2380.
- I. Minutes of pre-installation conference.
- J. Maintenance Data: Environmental Stoneworks' Installation Procedures.
- K. Warranty: Environmental Stoneworks' product and installation warranties.

1.5 QUALITY ASSURANCE

A. ICC-ES Certification: Environmental Stonework' current ICC-ES report 2380, including AC-51 testing data.

B. Single Source Responsibility: Obtain primary manufactured stone/brick veneer and trim from a single manufacturer with not less than twenty years of successful experience in manufacturing and five years of successful experience in installing principal materials described in this section. Manufacturer and Installer shall have completed at least ten projects of similar size and complexity. Provide secondary materials only of type and from source recommended by manufacturer of primary materials.

C. Manufacturer Qualifications:

Environmental Stoneworks...

1. has over 20 years experience in producing simulated masonry.
2. provides field service representative.
3. has ICC-ES certification.
4. has a 50 year product warranty.
5. is in good standing with the MVMA.

D. Installer Qualifications:

Environmental Stoneworks...

1. provides installers with a minimum of 5 years experience installing simulated masonry.
2. has documented installation procedures and field quality control program.
3. provides OSHA 10/30 Hour trained project management.
4. provides extensive jobsite safety programs including scaffold safety, fall protection and personal protective equipment

E. Product Compatibility: Manufacturers of products and systems certify in writing that products are compatible.

F. Pre-Installation Conference:

1. General contractor shall arrange a meeting not less than thirty days prior to starting work.
2. Attendance:
 - a. General Contractor
 - b. Architect/Owner's Representative
 - c. Environmental Stoneworks Representative

G. Warranty: Single Source Warranty.

1. Environmental Stoneworks' Fifty (50) year product warranty.
2. Environmental Stoneworks' One (1) year installation warranty.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials in Environmental Stoneworks' original, unopened, undamaged containers with identification labels intact.
- B. Storage and Protection: Store materials to comply with Environmental Stoneworks' written instructions to prevent deterioration from moisture, temperature or other detrimental effects.

1.7 SITE CONDITIONS

- A. Environmental Site Conditions: Comply with Environmental Stoneworks' Installation Procedures for environmental conditions.

PART 2 – PRODUCTS

2.1 MANUFACTURER

Environmental Stoneworks manufactured stone veneer is engineered from Portland cement, expanded shale fine, expanded shale medium, mineral iron oxide color, and various other chemical additives. The product is engineered to achieve a specified strength, color, and texture and resistance to effects of weathering. Environmental Stoneworks manufactured stone veneer is engineered in various shapes and patterns to simulate natural stone and are installed in a non-load bearing veneer and trim capacity e.g., drip ledge and quoins, caps etc...

A. Stone Veneer Properties:

1. Thickness: 1-1/8-2-1/2 inches
2. Weight: maximum of 15 lbs/SF
3. Density to be determined under ASTM C 567
4. Compressive Strength: Minimum of 1,800 PSI when tested in accordance with ATSM C 192
5. Water absorption: less than 18% when tested in accordance with ASTM C-140 or UBC standard 15-5
6. Freeze-thaw: less than 3% mass loss when tested in accordance with ASTM C 67
7. Shear Bond Strength: minimum of 50 PSI when conducted in accordance with ASTM C 482
8. Thermal Resistance: $R \geq .865$ when tested at a thickness of 1.0 inch (25.4 mm) in accordance with ASTM C 518
9. Smoke and fuel contribution: UL listed 0/0
10. Flexural strength: tested in accordance with ASTM C 348, Section 4.4
11. Tensile strength: tested in accordance with ASTM C 190, Section 4.5
12. Weather resistance: Mix design proven by test results to be resistant to degradation by weather.

B. Architectural Trim:

1. Products: Single source from Environmental Stoneworks.
2. Wall Capstones:
 - a. Texture: As selected by Architect from manufacturer's full range.
 - b. Color: As selected by Architect from manufacturer's full range.
 - c. Size: As indicated on the drawings.
3. Pier Capstones:
 - a. Texture: Chiseled
 - b. Color: As selected by Architect from manufacturer's full range.
 - c. Size: As indicated on the drawings.

4. Watertable/sill:
 - a. Color: As selected by Architect from manufacturer's full range.
 - b. Size: As indicated on the drawings
 - c. Provide sloped top surface and drip edge.
5. Light Fixture Stones:
 - a. Color: As selected by Architect from manufacturer's full range.
 - b. Size: As necessary for light fixture indicated.
 - c. UL approved metal extension box may be provided.
6. Receptacle Stones:
 - a. Color: As selected by Architect from manufacturer's full range.
 - b. Size: As necessary for light electrical outlet.
 - c. UL approved metal extension box may be provided.

C. Weather Resistant Barrier: ASTM D 226, 2 layers of No. 15 non-perforated asphalt-saturated organic felt paper or 1 layer and a house-wrap product supported by a current evaluation report showing equivalency to Grade D building paper. Install weather resistive barrier (per manufacturer's instructions) over all exterior surfaces designated to receive stone veneer and require waterproofing. WRB shall be applied horizontally with the upper layer lapped over the lower layer at not less than 2 inches. Lap weather-resistive barrier not less than 6 inches at the vertical joints. In the case of applications with two layers, start with two horizontal layers at the bottom of exterior wall or structure.

D. Reinforcing (Lath): Corrosion resistant minimum 2.5 lbs per square yard expanded metal lath that complies with ASTM C 847, or, corrosion resistant minimum 18 gauge woven wire mesh that complies with ASTM C 1032. For open studs and non solid sheathing (e.g. rigid insulation board) use corrosion resistant minimum 3.4 lbs per square yard, 3/8" paper backed lath (paper backing shall meet the requirements of ASTM D226 to be considered a substitute for Weather Resistive Barrier). Any alternative lath material shall carry an evaluation report that rates the lath as an acceptable substitute to the above listed materials. Lap lath not less than 2 inches all around vertically and horizontally. Terminate lath a minimum of 2 inches on the foundation and/or flange of the weep screed or as directed by project specifications and or local building codes. Metal lath can be installed with the small cups pointing upward to better capture mortar scratch coat.

E. Fasteners: Galvanized steel fasteners (nails, staples or screws), for wood stud applications (open, rigid sheathing, rigid foam insulation) should penetrate the stud a minimum of 3/4 inch. Spacing of these fasteners should be a maximum of 6" vertical and should be 16" horizontal (on the studs). These fasteners should be a minimum of 1 1/2 inches long, 11 gage nails having a 7/16 inch head or 7/8 inch long, 16 gage staples. Corrosion resistant screws should have a 7/16 inch head and should penetrate the metal stud a minimum of 3/8 inch. Refer to governing building code for information on specific fastener penetration depth.

In the case of rigid sheathing, care should be taken to avoid excessive fasteners applied between wall framing. In the case of exterior gypsum sheathing (e.g. DensGlass), fasteners should only be applied into wall framing unless additional fasteners are approved by the design professional.

F. Weep Screed: Foundation Weep Screed shall be corrosion resistant and a minimum 0.019-inch (No. 26 galvanized sheet gauge, fabricated plastic or vinyl material) with a minimum vertical attachment of 3 1/2 inches. Weep screed should have holes with a minimum diameter of 3/16 inch spaced at a maximum of 33 inches on center. Install Foundation Weep Screed per

manufacturer's instructions and integrate with WRB and metal lath. Weep screed shall have a minimum of 3 ½ inches attachment flange at or below the foundation plate line on exterior walls in accordance with ASTM C926. The exterior lath shall cover and terminate on the attachment flange of the weep screed. Weep holes should not be covered during installation.

G. Clearances: Weep Screed and/or stone should be held a minimum of 4 inches above finished grade or per local code and building practices. Weep screed and/or stone shall be held at a clearance above hard surfaces a minimum of 2 inches or as per local code and building practices. Weep screed terminations that meet concrete surfaces that are supported by a footing shall be held at a clearance above the concrete a minimum of 1/2 inch.

H. Mortar: To be mixed with potable water clean and free from injurious amounts of oils, acids, alkalis, salts, organic minerals or other deleterious substances.

Parts by Volume					
	Portland or Blended Cement ASTM C150	Masonry Cement Type N ASTM C91	Masonry Cement Type S ASTM C91	Lime ASTM C207	Sand ASTM C144
Mix 1	1	1			2.25-3
Mix 2	1			1	4.5
Mix 3			1		2.25-3
Mix 4		1			2.25-3
Mix 5	Mix 1 part Type S Mortar Mix with volume of water indicated on instructions				

PART 3 – EXECUTION

A. Environmental Stoneworks' Installation Procedures:

1. Comply with Environmental Stoneworks' product data, including but not limited to: product technical bulletins, manufacturer's installation procedures and product carton procedures for installation.

B. Examination:

1. Examine substrates, with Installer present, for conditions affecting performance and proceed with application only after unsatisfactory conditions have been corrected.

C. Preparation:

1. General: Prepare and clean substrate according to Environmental Stoneworks' Installation Procedures.

D. Application:

1. General: Comply with Environmental Stoneworks' Installation Procedures.
2. Corners: Provide Environmental Stoneworks' pre-manufactured corner units. Field built corners are not recommended.

E. Cleaning:

1. Clean stone veneer in accordance with Environmental Stoneworks' Installation Procedures.

F. Protection:

1. In progress and finished work may be protected from rain for 48 hours following installation.
2. Protect finished work from damage until the date of Substantial Completion.

END OF SECTION 047000

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