SECTION 04 73 00

SIMULATED MASONRY

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\*\* NOTE TO SPECIFIER \*\* Environmental Stoneworks; manufactured stone veneer and trim.
This section is based on the products of Environmental Stoneworks, who's corporate office is located at:
6300 E. Stapleton Dr. S.
Denver, CO 80216
Toll Free: 800-891-5402
Email:arcatcontactus@estoneworks.com
Web Site: www.estoneworks.com
Web Site: www.myclipstone.com
Environmental Stoneworks is built upon the idea of creating harmony in one's surroundings with our natural materials and abilities. As the nation's largest turnkey provider of manufactured stone veneer, we design, manufacture and install our products for many of the country's leading builders and architects from coast to coast.
Our unique ability to tailor our products and services to the distinct architectural preferences within each region of the U.S. is at the heart of our success, as are our ongoing investments in design, manufacturing processes and leading customer service.
All of this provides a solid foundation for meeting the increasing needs of today's builders and architects. If your project has stone, there is no better company to take care of your needs than Environmental Stoneworks.

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Mortared manufactured stone veneer and trim.
		2. Mortared manufactured brick veneer and trim.
		3. Mortarless manufactured stone veneer and trim. (ClipStone)
	1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 03 30 00 - Cast-in-Place Concrete.
		2. Section 04 20 00 - Unit Masonry.
		3. Section 05 40 00 - Cold-Formed Metal Framing.
		4. Section 06 10 00 - Rough Carpentry.
		5. Section 06 16 36 - Wood Panel Product Sheathing.
		6. Section 07 10 00 - Dampproofing and Waterproofing.
		7. Section 07 60 00 - Flashing and Sheet Metal.
		8. Section 07 90 00 - Joint Protection.
		9. Section 10 30 00 - Fireplaces and Stoves.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. American National Standards Institute (ANSI): ANSI A118.4 Specification for Latex-Portland Cement Mortar.
		2. ASTM International (ASTM):
			1. ASTM A641 - Standard Specification for Zinc-Coated. (Galvanized) Carbon Steel Wire.
			2. ASTM C 39 - Test Method for Compressive Strength of Cylindrical Concrete Specimens.
			3. ASTM C 67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
			4. ASTM C 140 - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
			5. ASTM C 144 - Standard Specification for Aggregate for Masonry Mortar.
			6. ASTM C 150 - Standard Specification for Portland Cement.
			7. ASTM C 207 - Standard Specification for Hydrated Lime for Masonry Purposes.
			8. ASTM C 270 - Standard Specification for Mortar for Unit Masonry.
			9. ASTM C 348 - Standard test Method for Flexural Strength of Hydraulic-Cement Mortars.
			10. ASTM C 482 - Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement.
			11. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
			12. ASTM C 778 - Standard Specification for Standard Sand.
			13. ASTM C 847 - Standard Specification for Metal Lath.
			14. ASTM C 932 - Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering.
			15. ASTM C 979 - Standard Specification for Pigments for Integrally Colored Concrete.
			16. ASTM C 1032 - Standard Specification for Woven Wire Plaster Base.
			17. ASTM C 1059 - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete.
			18. ASTM C 1262 Standard Test Method for Evaluating the Freeze Thaw Durability of Manufactured Concrete Masonry Units and Related Concrete Units.
			19. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
			20. ASTM F 1667 - Standard Specification for Driven Fasteners, Nails, Spikes and Staples.
			21. ASTM D1761 - Mechanical Fasteners
			22. ASTM D 3498- Construction Adhesive
		3. Building Code Compliance: The International Association of Plumbing and Mechanical Officials (IAPMO).
		4. International Union of Laboratories and Experts in Construction Materials, Systems and Structures (RILEM):
			1. RILEM Test No. II.4 - Water Absorption Under Low Pressure (Pipe Method).
		5. US Green Building Council's (USBGC) Leadership in Energy and Environmental Design (LEED).
		6. Masonry Veneer Manufacturers Association (MVMA).
		7. Underwriter's Laboratory (UL) 723 - Standard for Safety for Surface Burning Characteristics of Building Materials.
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		2. Product Data: Manufacturer's data sheets on each product to be used, including:
			1. Preparation instructions and recommendations.
			2. Storage and handling requirements and recommendations.
			3. Installation methods.
			4. Cleaning instructions and maintenance data.
		3. Shop Drawings: Indicate layout, show profiles and product components, including but not limited to anchorage, accessories, finish colors, patterns, textures, edge conditions and relationships with adjacent construction or surfaces.
		4. Qualification Data: Safety and quality documentation for manufacturer and installer.
		5. Test Reports: Certified test reports indicating compliance with specified performance requirements and conformance with specified physical properties.

\*\* NOTE TO SPECIFIER \*\* The following paragraph should remain for projects in which a separate weather resistive barrier is not required. In some applications a weather resistant barrier is not required so long as compliance with ASTM D 226 is achieved. The paper backing on a reinforcing lath (specified below) must meet the requirements of ASTM D 226 to be considered a substitute for a weather resistive barrier. Any lath material not approved in writing manufacturer shall carry an evaluation report that rates the lath as an acceptable substitute to a weather resistant barrier, in accordance with ASTM D 266. Delete if not required. Not required for mortarless product application.

* + 1. Evaluation Reports: For metal lath with paper backing in lieu of weather resistive barrier.

\*\* NOTE TO SPECIFIER \*\* Certificate for mortar setting bed veneer stone. Delete if not required.

* + 1. Certificates: IAPMO - ER-386.

\*\* NOTE TO SPECIFIER \*\* Certificate for mortar less fastener attached veneer stone. Delete if not required.

* + 1. Certificates: IAPMO - ER-383.
		2. LEED Submittals: Manufacturer's certification for regional materials and recycled content.
		3. Pre-Installation Conference: Minutes of pre-installation conference.
		4. Warranty Documentation: Product and installation warranties.
		5. Verification Samples: For each product specified, two sample boards, representing colors, patterns, textures, finishes and mortar to be installed.
	1. QUALITY ASSURANCE
		1. IAMPO Certification: Environmental Stonework' current IAMPO report - ER-383/386, including AC- 51 testing data.
		2. Single Source Responsibility: Obtain primary manufactured stone/brick veneer and trim from a single manufacturer to the greatest extent possible. Provide secondary materials only of type and from source recommended by manufacturer of primary materials.
		3. Manufacturer Qualifications: IAMPO certification and in good standing with the MVMA.
			1. Shall have a minimum of 30 years experience in producing manufactured stone veneer.
			2. Shall provide documentation that they have completed at least 10 projects of similar size and complexity if requested.
			3. Provides field service representative.
		4. Installer Qualifications:
			1. Shall have a minimum of 5 years experience installing manufactured stone veneer.
			2. Has documented installation procedures and field quality control program.
			3. Provides OSHA 10/30 Hour trained project management.
			4. Capable of providing extensive jobsite safety programs including scaffold safety, fall protection and personal protective equipment.
		5. Product Compatibility Documentation: Manufacturers of products and systems certify in writing that products are compatible.
	2. SEQUENCING AND SCHEDULING
		1. Conference: Convene a pre-installation conference to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.
		2. Pre-Installation Conference: Convene not less than 30 days prior to work. Attendees to include Contractor, Architect, manufacturer's representative.
	3. PROJECT CONDITIONS
		1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
	4. DELIVERY, STORAGE AND HANDLING
		1. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards; in manufacturer's unopened packaging with identification labels intact until ready for installation. Protect from damage.
	5. WARRANTY
		1. Manufacturer's standard limited warranty for materials and workmanship.

\*\* NOTE TO SPECIFIER \*\* Delete warranty period if not required.

* + - 1. Warranty Period for Installation: 1 year.
			2. Warranty Period for Manufactured Product: 50 years.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: Environmental StoneWorks , which is located at: 7306 S. Alton Way Unit B; Centennial, CO 80112; Toll Free Tel: 800-891-5402; Email: [request info (arcatcontactus@estoneworks.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Environmental+StoneWorks+&coid=44448&rep=&fax=&message=RE:%20Spec%20Question%20(04730esw):%20%20&mf=); Web: <http://www.estoneworks.com> | <https://www.myclipstone.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

\*\* NOTE TO SPECIFIER \*\* Environmental Stoneworks manufactured stone veneer is engineered from Portland cement, expanded shale fine, expanded shale medium, mineral iron oxide color, and 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 including but not limited to drip ledge and quoins and caps. Delete if not required.

* 1. MANUFACTURED STONE/BRICK VENEER AND TRIM
		1. Product: Manufactured stone and brick as manufactured by Environmental Stoneworks.
		2. Manufactured Stone and Brick Veneer Properties:
			1. Stone Thickness: 1-1/8 inches (28.5 mm) to 2-1/2 inches (63.5 mm).
			2. Thin Brick Size: 5/8 inches (16 mm) to 1 inch (25.4 mm) thick; 2-1/2 inches (63.5 mm) wide by 8 inch (203 mm) length.
			3. Weight: Maximum of 15 lbs/ft2 (73 kg/m2).
			4. Density: As determined by ASTM C 567.
			5. Compressive Strength: Minimum of 1,800 PSI (12.4 Mpa) when tested in accordance with ATSM C 192.
			6. Water Absorption: Less than 18 percent when tested in accordance with ASTM C140 or UBC standard 15-5.
			7. Freeze-Thaw: Less than 3 percent mass loss when tested in accordance with ASTM C 67.
			8. Shear Bond Strength: Minimum of 50 PSI (0.345 MPa) when conducted in accordance with ASTM C 482.
			9. Thermal Resistance: R-value greater than or equal to 0.865 when tested at a thickness of 1.0 inch (25.4 mm) in accordance with ASTM C 518.
			10. Smoke and Fuel Contribution: UL listed 0/0.
			11. Flexural Strength: Tested in accordance with ASTM C 348, Section 4.4.
			12. Tensile Strength: Tested in accordance with ASTM C 190, Section 4.5.
			13. Weather Resistance: Mix design proven by test results to be resistant to degradation by weather.
		3. Architectural Trim:
			1. Products: Single source from Environmental StoneWorks.
			2. Wall Capstones:
				1. Texture: As selected by Architect from manufacturer's full range.
				2. Color: As selected by Architect from manufacturer's full range.
				3. Size: As selected by Architect from manufacturer's full range.
			3. Pier Capstones:
				1. Texture: Chiseled.
				2. Color: As selected by Architect from manufacturer's full range.
				3. Size: As selected by Architect from manufacturer's full range.
			4. Watertable/sill:
				1. Color: As selected by Architect from manufacturer's full range.
				2. Size: As selected from manufactured full range.
				3. Provide sloped top surface and drip edge.
			5. Light Fixture Stones:
				1. Color: As selected by Architect from manufacturer's full range.
				2. Size: As necessary for light fixture indicated.
				3. UL approved metal extension box may be provided.
			6. Receptacle Stones:
				1. Color: As selected by Architect from manufacturer's full range.
				2. Size: As necessary for light electrical outlet.
				3. UL approved metal extension box may be provided.

\*\* NOTE TO SPECIFIER \*\* In some applications weather resistant barrier not required if compliance with ASTM D 226 is achieved. Paper backing on reinforcing lath (specified below) meeting the requirements of ASTM D 226 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. Delete if not required.

* + 1. Weather Resistant Barrier: In compliance with ASTM D 226.

\*\* NOTE TO SPECIFIER \*\* Delete description of barrier type not required.

* + - 1. Description: 2 layers of No. 15 non-perforated asphalt-saturated organic felt paper.
			2. Description: 1 layer of No. 15 non-perforated asphalt-saturated organic felt paper and a house-wrap product supported by a current evaluation report showing equivalency to Grade D building paper.
		1. Reinforcing (Lath):

\*\* NOTE TO SPECIFIER \*\* Delete materials not required.

* + - 1. Materials: Corrosion resistant, minimum 2.5 lbs per square yard (1.36 kg/m2) expanded metal lath in compliance with ASTM C 847.
			2. Materials: Corrosion resistant, minimum 18 gauge woven wire mesh that complies with ASTM C 1032.
			3. Materials: Corrosion resistant, minimum 3.4 lbs per square yard (1.84 kg/m2) expanded metal lath, 3/8 inch (9.5 mm) thick, with paper backing on lath meeting the requirements of ASTM D 226.

\*\* NOTE TO SPECIFIER \*\* Any alternative lath material must carry an evaluation report that rates the lath as an acceptable substitute to the above listed materials. Delete if not required.

* + - 1. Materials: \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
		1. Fasteners: Galvanized steel fasteners.

\*\* NOTE TO SPECIFIER \*\* Delete if application not required.

* + - 1. For Wood Stud Applications:
				1. Nails: 11 gage nails having a 7/16 inch (11 mm) head, minimum of 1-1/2 inches (38 mm) long.
				2. Staples: 7/8 inch long (22 mm), 16 gauge staples.

\*\* NOTE TO SPECIFIER \*\* Delete if application not required.

* + - 1. For Metal Stud Applications:
				1. Screws: Corrosion resistant screws with 7/16 inch (11 mm) head and of sufficient length to penetrate metal stud a minimum of 3/8 inch (9.5 mm).
		1. Weep Screed: Corrosion resistant, minimum 0.019 inch (0.5 mm with a minimum vertical attachment of 3-1/2 inches (89 mm).
			1. Holes: Minimum diameter of 3/16 inch (4.75 mm), spaced at a maximum of 33 inches (838 mm) on center.
			2. Attachment Flange: Minimum of 3-1/2 inches (89 mm).

\*\* NOTE TO SPECIFIER \*\* Delete materials not required.

* + - 1. Materials: Plastic fabrication.
			2. Materials: Vinyl fabrication.
		1. Mortar: Mixed with potable water clean and free from injurious amounts of oils, acids, alkalis, salts, organic minerals or other deleterious substances.

\*\* NOTE TO SPECIFIER \*\* ClipStone stone veneer is a precast concrete product engineered from Portland cement, light weight aggregates, mineral oxide, and chemical additives to resemble natural stone in both texture and color. Each veneer unit has galvanized metal mounting clips and is engineered to resist the effects of weathering. ClipStone manufactured stone veneers units are installed in a non- load bearing veneer and trim capacity e.g., drip ledge and quoins, caps, etc. Delete if not required.

* 1. MORTARLESS MANUFACTURED STONE VENEER AND TRIM
		1. Product: ClipStone as manufactured by Environmental Stoneworks.
		2. Manufactured Stone Veneer Properties:
			1. Stone Thickness: 1-1/8 inches (28.5 mm) to 2-1/2 inches (63.5 mm).
			2. Stone Width: 11-1/8 inches (28.5 mm) to 3-1/2 inches (89 mm).
			3. Stone Length: 6 inches (152 mm) to 19 inches (483 mm).
			4. Weight: Maximum of 15 lbs/ft2 (73 kg/m2).
			5. Density: As determined by ASTM C 567.
			6. Compressive Strength: Minimum of 1,800 PSI (12.4 Mpa) when tested in accordance with ATSM C 192.
			7. Water Absorption: Less than 18 percent when tested in accordance with ASTM C140 or UBC standard 15-5.
			8. Freeze-Thaw: Less than 3 percent mass loss when tested in accordance with ASTM C 67.
			9. Shear Bond Strength: Minimum of 50 PSI (0.345 MPa) when conducted in accordance with ASTM C 482.
			10. Thermal Resistance: R-value greater than or equal to 0.865 when tested at a thickness of 1.0 inch (25.4 mm) in accordance with ASTM C 518.
			11. Smoke and Fuel Contribution: UL listed 0/0.
			12. Flexural Strength: Tested in accordance with ASTM C 348, Section 4.4.
			13. Tensile Strength: Tested in accordance with ASTM C 190, Section 4.5.
			14. Weather Resistance: Mix design proven by test results to be resistant to degradation by weather.
		3. Architectural Trim:
			1. Products: Single source from Environmental StoneWorks.
			2. Water Table/Sill: Provide sloped top surface and drip edge. Color and size as selected from manufacturer's full range.
		4. Weather Resistant Barrier: In compliance with ASTM D 226.

\*\* NOTE TO SPECIFIER \*\* Delete description of barrier type not required.

* + - 1. Description: 2 layers of No. 15 non-perforated asphalt-saturated organic felt paper.
			2. Description: 1 layer of No. 15 non-perforated asphalt-saturated organic felt paper and a house-wrap product supported by a current evaluation report showing equivalency to Grade D building paper.
		1. Fasteners: #8 stainless steel or zinc plated Phillips head screws 1-1/4 inches (32 mm) long.
		2. Starter Strip: Foundation Starter Strip shall be G60 coated hot-dipped galvanized and a minimum 0.012 inch (0.3 mm) (No. 28 gauge material) with a minimum vertical attachment of 3-1/2 inches (89 mm). Starter Strip should have weep holes with a minimum diameter of 3/16 inch (4.8 mm) spaced at a maximum of 12 inches (304 mm) on center.
1. EXECUTION
	1. PREPARATION
		1. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.
		2. Do not proceed with installation until substrates have been properly prepared and deviations from manufacturer's recommended tolerances are corrected. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
		3. Commencement of installation constitutes acceptance of conditions.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. MORTARED STONE/BRICK VENEER INSTALLATION
		1. Install in accordance with manufacturer's written instructions and recommendations, including the following.

\*\* NOTE TO SPECIFIER \*\* Manufacturer does not recommend field-built corners. Delete if not required.

* + - 1. Corners: Install pre-manufactured corner units. Field built corners are not permitted.
			2. Weather Resistant Barrier:
				1. Install weather resistive barrier in accordance with weather resistive barrier manufacturer's instructions over all exterior surfaces designated to receive stone veneer.
				2. Apply weather resistive barrier horizontally with the upper layer lapped over the lower layer at not less than 2 inches (51 mm).
				3. Lap weather-resistive barrier not less than 6 inches (152 mm) at the vertical joints.
				4. In the case of applications with two layers, start with two horizontal layers at the bottom of exterior wall or structure.
			3. Reinforcing (Lath):
				1. Lap lath not less than 2 inches (51 mm) around vertically and horizontally.
				2. Terminate lath a minimum of 2 inches (51 mm) on the foundation and flange of the weep screed or as directed by project specifications and or local building codes.
				3. Install metal lath with the small cups pointing upward to better capture mortar scratch coat.
			4. Fasteners:
				1. In the case of rigid sheathing, avoid excessive fasteners applied between wall framing. In the case of exterior gypsum sheathing (e.g. DensGlass), fasteners shall only be attached into wall framing unless additional fasteners are approved by the design professional.
				2. Wood Stud Applications:

Penetration Depth: Fasteners shall penetrate stud a minimum depth of 3/4 inch (19 mm). Refer to governing building code for information on specific fastener penetration depth.

Spacing: Maximum of 6 inches (152 mm) vertically and 16 inches (406 mm) horizontally.

* + - * 1. Metal Stud Applications:

Penetration Depth: Screws shall penetrate stud a minimum depth of 3/8 inch (9.5 mm). Refer to governing building code for information on specific fastener penetration depth.

* + - 1. Weep Screed: Integrate with weather resistive barrier and metal lath
				1. Attachment Flanges: Minimum of 3-1/2 inches (89 mm) at or below the foundation plate line on exterior walls in accordance with ASTM C 926. The exterior lath shall cover and terminate on the attachment flange of the weep screed.
				2. Do not cover weep holes during installation.
			2. Clearances:
				1. Weep Screed and Stone above Finished Grade: Terminates a minimum of 4 inches (102 mm) or per local code and building practices.
				2. Weep Screed and Stone above Paved Surfaces: Terminates a minimum of 2 inches (51 mm) or as per local code.
				3. Weep Screed And Stone above Paved Walking Surface Supported By Same Foundation Supporting The Wall: Terminates a minimum of 1/2 inch (13 mm) or as per local code.
			3. Mortar: Mix with potable water clean and free from injurious amounts of oils, acids, alkalis, salts, organic minerals or other deleterious substances.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. MORTARLESS STONE VENEER INSTALLATION
		1. Install in accordance with manufacturer's written instructions and recommendations, including the following.
			1. Fasteners shall penetrate the OSB a minimum of3/4 inch (19 mm). There shall be a minimum of 2 (two) screws per stone, for units over 16 inches (406 mm).
			2. Starter Strip: Integrate with weather resistive barrier.
				1. Attachment Flanges: Minimum of 3-1/2 inches (89 mm) at or below the foundation plate line on exterior walls in accordance with ASTM C 926.
				2. Do not cover weep holes during installation.
			3. Clearances:
				1. Starter Strip and Stone above Finished Grade: Terminates a minimum of 4 inches (102 mm) or per local code and building practices.
				2. Starter Strip and Stone above Paved Surfaces: Terminates a minimum of 2 inches (51 mm) or as per local code.
				3. Starter Strip And Stone above Paved Walking Surface Supported By Same Foundation Supporting The Wall: Terminates a minimum of 1/2 inch (13 mm) or as per local code.
	2. CLEANING AND PROTECTION
		1. Cleaning: Clean stone veneer in accordance with manufacturer's written instructions and recommendations.
		2. Protection:
			1. Protect in-progress and finished work from rain for 48 hours following installation.
			2. Protect finished work from damage until the date of Substantial Completion. Repair damaged components.

END OF SECTION