SECTION 04 22 00.13

Concrete Unit Lightweight Veneer Masonry

1. General
	1. Section Includes
		1. Concrete Lightweight Veneer Masonry.
	2. Related Sections

[Specifier Notes] – Retain only those sections related to the scope of work in this section.

* + 1. Section 03 30 00 - Cast-in-Place Concrete.
		2. Section 06 16 00 - Sheathing.
		3. Section 07 60 00 - Flashing and Sheet Metal.
		4. Section 07 90 00 - Joint Protection.
		5. Section 09 24 00 - Cement Plastering.
	1. References

[Specifier Notes] – Retain only those references contained within the edited scope of work in this section and delete all others.

* + 1. ASTM C140 - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
		2. ASTM C170 - Standard Test Method for Compressive Strength of Dimension Stone.
		3. ASTM C270 - Standard Specification for Mortar of Unit Masonry.
		4. ASTM C482 - Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement Paste.
		5. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
		6. ASTM C666 - Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.
		7. ASTM C847 - Standard Specification for Metal Lath.
		8. ASTM C933 - Standard Specification for Welded Wire Lath.
		9. ASTM C1262 - Standard Test Method for Evaluating the Freeze Thaw Durability of Dry-Cast Segmental Retaining Walls and Related Units
		10. ASTM D226 - Standard Specification for Asphalt Saturated Organic Felt Used in Roofing and Waterproofing.
		11. ASTM E2556/E2556M - Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment.
		12. ICC-ES AC38 - Acceptance Criteria for Water Resistive Barriers.
		13. ICC\_ES AC275 - Glass Fiber Lath Used in Cementitious Exterior Wall Coatings or Exterior Cement Plaster (Stucco).
	1. Definitions
		1. CMU: Concrete Masonry Veneer Unit.
		2. WRB: Water Resistive Barrier.
		3. Dimensions: All unit sizes are shown as Nominal Dimensions.
	2. Administrative Requirements
		1. Scheduling: Provide to Owner or Owner’s representative a schedule and list of participants required to attend coordination and progress update meetings.

[Specifier Notes] – Retain only those individuals required to be in attendance for progress meetings. Delete the entire following sub-paragraph if not required.

* + - 1. Owner representative(s) for Facilities Management.
			2. General Contractor.
			3. Project Manager.
			4. Manufacturer’s Representative.
			5. Project Architect.
			6. Project Engineer.
	1. Informational SUBMITTALS
		1. Submit under provisions of Section 01 30 00.
		2. Product Data: Manufacturer's product information and data sheets for each product specified in this section, including:
			1. Substrate preparation instructions and recommendations.
			2. Installation means and methods.
			3. Recommendations and requirements for proper storage and handling.
		3. Shop Drawings:
			1. Submit Manufacturer’s approved shop drawings detailing the section and elevation views of each product to be installed.
			2. Coordinate with locations listed on Contract Drawings.
		4. Warranty Information:
			1. Submit confirmation and details of manufacturer’s warranty, extended warranty, and replacement policies.
		5. Submit product data for each type of product specified, including certification that each type complies with specified requirements.
		6. Submit samples for textures and colors of the veneer units.
			1. Standard sample display consisting of a small representation of veneer units showing the full range of colors and textures.
		7. Mock-Up: Construct a mock-up using the selected stone and mortar materials to illustrate the appearance of the Work specified in this section.
			1. The mock-up should be a nominal 36 inches x 36 inches.
			2. Construct the mock-up using the veneer size, color blend, texture, joint size, and installation methods specified.
			3. Architect and Owner’s Representative must approve the mockup prior to commencement of Work.
	2. Closeout SUBMITTALS
		1. Spare Materials: Provide spare veneer units of each color and finish combination used on the project.

[Specifier Notes] – Retain one of the next two paragraphs based upon project requirements for spare components.

* + - 1. \_\_\_\_\_\_\_\_ spare units for each color and finish combination.
			2. Provide spare materials as noted in the schedule related to work in this section.
	1. Delivery, Storage and Handling
		1. Deliver masonry materials to the site on quality wooden pallets with appropriate in-plant packaging for safe transit and handling. Store pallets in single stacks on level ground and protect from weather.
		2. Deliver mortar materials in original unbroken, undamaged packages with labels intact and visible.
		3. Store materials covered and off the ground until used on the Work in this section.
	2. WARRANTY
		1. Provide a copy of the project specific manufacturer's warranty which addresses the term of the warranty period (in years), the acceptable standards of production/performance and the agreed upon action for products that fail to meet the standards of production/performance within the specified warranty period.
			1. Warranty period: \_\_\_\_\_\_\_ years.
1. Products
	1. MANUFACTURERS

[Specifier Notes] – Retain the following Paragraph if this document is a PROPRIETARY Specification, with Avigilon’s products listed as the Basis of Design. Delete if not required.

* + 1. Basis of Design Manufacturer: Echelon, An Oldcastle Company.
			1. Address: 3 Glenlake Pkwy, FL 12, Atlanta, GA 30328.
			2. Phone: (844) 495-8211.
			3. Website: www.echelonmasonry.com.

[Specifier Notes] – Retain the following Paragraph if this document is written as a PERFORMANCE specification, without listing a manufacturer as a basis of design. Insert manufacturers that sell products comparable to those specified in this section. Delete if not required.

* + 1. Provide products meeting the requirements specified in this section, from one of the following manufacturers:
			1. <Manufacturer>.
		2. Substitution Limitations:
			1. Submit substitution requests in accordance with provisions of Section 01 60 00.
	1. Design Criteria
		1. Adhered veneer units must not exceed 2 5/8 inches in thickness, 36 inches in any face dimension, and no greater than 5 sq. ft. in total area.
		2. Individual veneer units not to exceed 15 lbs./sq. ft. (saturated weight).
		3. Shear Strength: Adhesion developed between adhered thin veneer units and backing must attain a shear strength of at least 50 psi based on gross unit surface area when tested in accordance with ASTM C482, or shall be adhered in compliance with Article 3.3 C of TMS 602/ACI 530.1/ASCE 6.
		4. Compressive Strength: Minimum 2000 psi with no individual specimen having a measured compressive strength less than 1800 psi.
		5. Freeze-thaw durability: Meets or exceeds the requirements of ASTM C1262, and exhibit a mass loss no greater than 1.5%. Test specimens must not show any fracture completely through the cross section when subjected to 50 consecutive freeze/thaw cycles.
		6. Water Repellant: Concrete Masonry Units must include a water repellant admixture at the time of production.
	2. Concrete Unit lightweight Veneer
		+ 1. Basis of Design Product: Hillcrest™ Stone Lightweight Veneers from Echelon.

 [Specifier Notes] – Select specified finish(es) from one of the following options. Where a blend is specified, retain more than one. Coordinate amounts of each in the finish schedule related to the Work specified in this section.

* + - * 1. Finish: As selected from the Manufacturer’s standard color palette.
			1. Performance:
				1. Compressive Strength: Minimum 2000 psi when tested in accordance with ASTM C1634.
				2. Maximum Saturated Weight: 15 lbs./sq. ft.
				3. Average Density: 105 lbs./cu. ft.
			2. Dimensions:
				1. Depth: Ranging from 1 1/8 to 1 5/8 inches.

[Specifier Notes] – Retain one or more heights required for the scope of work on this project. Delete those not required from the following paragraphs.

* + - * 1. Height: 2 inches
				2. Height: 3 inches.
				3. Height: 4 inches.
				4. Height: 6 inches.

[Specifier Notes] – Retain one or more lengths required for the scope of work on this project. Delete those not required from the following paragraphs.

* + - * 1. Length: 6 inches.
				2. Length: 8 inches.
				3. Length: 10 inches.
				4. Length: 12 inches.
				5. Length: 16 inches.
				6. Length: 20 inches.
		1. General / Appearance: Integrally colored architectural masonry veneer with a modular design, tight dimensional tolerances and appearance to stone.

[Specifier Notes] – Retain the following paragraph if this is a PROPRIETARY specification based upon Echelon’s products.

* + 1. General / Appearance:

[Specifier Notes] – Retain the following paragraph if this is a PROPRIETARY specification based upon Echelon’s products.

* 1. Water Resistive Barrier

[Specifier Notes] – Water resistive barriers (WRB) are required in most applications and may be properly specified in many ways. Retain one of the following five options, selecting base and outer layers where different materials are to be used.

* + 1. Provide two layers of asphalt saturated building paper that conforms to ASTM D226, Type 1.
		2. Provide two layers of asphalt saturated Grade D building paper complying with ICC-ES AC38.
		3. Provide two layers of house wrap complying with ICC-ES AC38.
		4. Provide two layers of WRB complying with ASTM E2556/E2556M.
		5. Provide a water resistive barrier in the following configuration:

[Specifier Notes] – Continuous insulation may be substituted for the inner layer of WRB provided it is installed and sealed and/or taped in accordance with the insulation manufacturer's installation instructions and has an evaluation service (ICC-ES) report from an accredited evaluation service recognizing it as a WRB in accordance with ICC-ES AC38.

* + - 1. Base Layer: Asphalt saturated building paper that conforms to ASTM D226, Type 1.
			2. Base Layer: Asphalt saturated Grade D building paper complying with ICC-ES AC38.
			3. Base Layer: House wrap complying with ICC-ES AC38.
			4. Base Layer: WRB complying with ASTM E2556/E2556M.

[Specifier Notes] – Paper-backed lath that conforms to the requirements of ICC-ES AC38 Grade D paper may be substituted for the outer layer. Delete the next four paragraphs if paper-backed lath is specified.

* + - 1. Outer Layer: Asphalt saturated building paper that conforms to ASTM D226, Type 1.
			2. Outer Layer: Asphalt saturated Grade D building paper complying with ICC-ES AC38.
			3. Outer Layer: House wrap complying with ICC-ES AC38.
			4. Outer Layer: WRB complying with ASTM E2556/E2556M.
	1. Metal LAth

[Specifier Notes] – Paper-backed lath that conforms to the requirements of ICC-ES AC38 Grade D paper may be substituted for the outer layer of the WRB.

* + 1. Provide metal lath approved by the masonry veneer manufacturer and conforming to the requirements of ICC-ES AC275.

[Specifier Notes] – Select lath type from the following five options.

* + - 1. Expanded Metal Lath: Minimum 2.5 lb/yd2 self-furring metal lath conforming to the requirements of ASTM C847.
			2. Paper-Backed Expanded Metal Lath: Minimum 2.5 lb/yd2 self-furring metal lath conforming to the requirements of ASTM C847, with an asphalt saturated Grade D building paper backer complying with ICC-ES AC38.
			3. High Rib Metal Lath: 3/8 inch rib, 3.4 lb/yd2 or heavier, self-furring metal lath conforming to the requirements of ASTM C847.
			4. Welded Wire Lath: Conforming to the requirements of ASTM C933.
			5. Woven Wire Mesh: 18 gauge minimum, conforming to the requirements of ASTM C1032.
	1. MOrtar

[Specifier Notes] – In the following three paragraphs, retain only paragraphs applicable to work on this project. Select the specified mortar based upon the type and delivery method(s) required.

When considering mortar selections, verify the mortar can provide a minimum shear bond strength of at least 50 lb/in.², is consistent with the stone manufacturer’s recommendations, and is suitable for installation of adhered concrete masonry veneer. Prepackaged/ preblended mortars should be mixed and installed per mortar manufacturer’s instructions.

Visit the Echelon website or contact a local sales representative at [www.echelonmasonry.com](http://www.echelonmasonry.com) for more information.

* + 1. Scratch Coat:
			1. Provide site-mixed mortar that meets or exceeds the requirements of ASTM C270 Type N.
			2. Provide site-mixed mortar that meets or exceeds the requirements of ASTM C270 Type S.
			3. Provide pre-blended mortar that meets or exceeds the requirements of ASTM C1714/C1714M Type N.
			4. Provide pre-blended mortar that meets or exceeds the requirements of ASTM C1714/C1714M Type S.
		2. Setting Bed:
			1. Provide site-mixed mortar that meets or exceeds the requirements of ASTM C270 Type N.
			2. Provide site-mixed mortar that meets or exceeds the requirements of ASTM C270 Type S.
			3. Provide pre-blended mortar that meets or exceeds the requirements of ASTM C1714/C1714M Type N.
			4. Provide pre-blended mortar that meets or exceeds the requirements of ASTM C1714/C1714M Type S.
		3. Pointing:
			1. Provide site-mixed mortar that meets or exceeds the requirements of ASTM C270 Type N.
			2. Provide site-mixed mortar that meets or exceeds the requirements of ASTM C270 Type S.
			3. Provide pre-blended mortar that meets or exceeds the requirements of ASTM C1714/C1714M Type N.
			4. Provide pre-blended mortar that meets or exceeds the requirements of ASTM C1714/C1714M Type S.
		4. Mortar must include manufacturer approved compatible water repellent additive added to each batch in the dosage rates for mortar type specified.

[Specifier Notes] – Delete the entire Article “MIXES” if mortar and grout are specified in another section. and delete the remaining paragraphs of the Mortar and Grout Materials article.

* 1. Mixes
		1. Portland Cement: Conforming to ASTM C150 Type I, Type II or Type III as required to achieve optimal results based on ambient project conditions.
		2. Hydrated Lime: Conforming to ASTM C207, Type S.
		3. Aggregates: Conforming to ASTM C144 for mortar and ASTM C404 for grout.
		4. Pigments: Conforming to ASTM C979. Comply with quantity limitations in referenced standards and from the pigment manufacturer.
		5. Admixtures: Comply with quantity limitation specified ASTM C1384 “Standard Specification for Admixtures for Masonry Mortars” when adding to mortar.
			1. Cold Weather: Comply with ASTM C494 “Standard Specification for Chemical Admixtures for Concrete.”
			2. Water Repellant: Liquid polymeric, admixture that does not reduce flexural bond strength
				1. Basis of Design Product: RainBloc® Water Repellent Masonry Unit admixture, manufactured by ACM Chemistries, Inc.
		6. Water: Potable; Clean and drinkable.

 [Specifier Notes] – Select those accessories required on this project and delete all others. In no accessory stones are required, delete the entire article.

1. Execution
	1. Examination
		1. Verify that site conditions are properly prepared to receive concrete masonry units.
		2. Verify that bearing elements are within tolerances conforming to the requirements of ACI 117.
		3. Verify that locations of penetrations, projections and built-in items are correct and properly prepared for work specified in this section.
		4. Provide adequate lighting for masonry work by placing all lighting at a reasonable distance from the wall for even illumination.
	2. Preparation
		1. Proceed with installation only after substrate(s) are been properly prepared and within tolerances recommended by the manufacturer.
		2. Install through-wall flashing over exterior windows, relieving angles, doors, tops of walls, at the inside base of cavity walls, and under sills.
		3. Commencement of installation constitutes acceptance of site conditions.
		4. Draw veneer from more than one pallet at a time during installation.

[Specifier Notes] – NCMA TEK notes are available at EchelonMasonry.com.

* + 1. Refer to NCMA TEK Notes, for hot and cold weather construction practices.
	1. Water Resisitive Barrier
		1. Install a water resistive barrier starting at the bottom of the wall, overlapping the flashing and working upward.
		2. Overlap horizontally 2 to 4 inches and vertically a minimum of 6 inches in a water shedding fashion.
		3. Overlap Inside and outside corners a minimum of 16 inches.

[Specifier Notes] – Metal lath is required in most applications but may be omitted in cases where adhesion to the substrate is not in question. Consult the manufacturer or the MVMA Installation guide for more information:

<http://ncma-br.org/pdfs/masterlibrary/MVMA%20Installation%20Guide%204th%20Edition%20web.pdf>

* 1. Metal Lath
		1. Install metal lath over required substrates as determined by the veneer manufacturer, and in accordance with their installation requirements.
			1. Apply metal lath over the weather resistive barrier horizontally, overlapping 1 to 2 inches at both the horizontal and vertical seams.
			2. Wrap inside and outside corners a minimum of 12 inches.
			3. Fasten lath every 6 inches vertically into studs spaced 16 inches apart.
	2. Detailing, Flashing, AND CONTROL JOINTS
		1. Install flashing at locations shown in the plans and in strict accordance with Construction Drawings, manufacturer’s instructions and accepted best practices for masonry flashing.
			1. All flashing and accessory detailing components must be corrosion resistant.
			2. Verify that all flashing, including adjacent roof flashing, has been properly installed. Extend flashing material above horizontal terminations, roofing material, drainage planes or drainage products.
			3. Integrate all flashing materials with moisture resistive barriers to prevent water penetration into structure. Lap water resistive barriers over weep screed flanges in a water shedding fashion.
		2. Control Joints: Determine if and where control joints are needed. Consideration should be given to where differential movement is expected or where movement may be concentrated. Refer to NCMA TEK 10-02C for guidance on control joint locations.
	3. Veneer Installation
		1. General: Apply veneer with a full mortar bed and full head joints, properly jointed with other work. Buttering corners of joints, and deep or excessive furrowing of mortar joints is not permitted.
			1. Install concrete veneer in accordance with industry accepted masonry practices and manufacturer's instructions.
			2. Install veneer with the pattern indicated on Construction Drawings.
			3. Do not use veneer units with broken corners and edges.
			4. Construct forms as needed to adequately and safely support installed concrete masonry units until mortar has cured.
		2. Cutting: Make all unit cuts, including those for bonding, holes, boxes, etc., with motor-driven masonry saws, using either an abrasive or diamond blade. Cut neatly and locate for best appearance.
		3. Mortar Bedding:
			1. Lay units with full mortar coverage on head and bed joints taking care not to block cores to be grouted or filled with masonry insulation.
			2. Remove mortar from the face of masonry units before it sets.
		4. Grouting, Jointing and Pointing:
			1. Tool all joints into the specified texture when mortar is thumbprint hard.
			2. Remove mortar from the face of masonry units before it sets.
			3. Tuckpoint joints of scored units for proper appearance and to prevent water penetration. Rake joints are not permitted and will be considered defective work.

 [Specifier Notes] – NCMA TEK notes are available at EchelonMasonry.com.

* + 1. Weeps and Vents: Install weep holes and vents at proper intervals at courses above grade and at any water stops over windows, doors and beams. Consult NCMA TEK notes for proper flashing and drawings.
	1. Inspection and Cleaning
		1. Faces must conform to the requirements of ASTM C90 and ASTM C1634 when viewed from twenty (20) feet at right angles to the wall with normal lighting.
		2. Keep work surfaces clean during installation. Use brushes, rags and burlap to remove excess mortar lumps and smears prior to hardening on the finished surfaces.
		3. Refer to Manufacturers recommendations for cleaning instructions for installed veneers.

End of Section