SECTION 04 22 00.13

Concrete Unit Veneer Masonry

1. General
	1. Section Includes

Concrete Veneer Masonry.

* 1. Related Sections

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

Section 03 30 00 - Cast-in-Place Concrete.

Section 06 16 00 - Sheathing.

Section 07 21 13 - Board Insulation.

Section 07 60 00 - Flashing and Sheet Metal.

Section 07 90 00 - Joint Protection.

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.

ASTM C140 - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.

ASTM C170 - Standard Test Method for Compressive Strength of Dimension Stone.

ASTM C270 - Standard Specification for Mortar of Unit Masonry.

ASTM C482 - Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement Paste.

ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.

ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.

ASTM C666 - Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.

ASTM C1262 - Standard Test Method for Evaluating the Freeze Thaw Durability of Dry-Cast Segmental Retaining Walls and Related Units

ASTM D226 - Standard Specification for Asphalt Saturated Organic Felt Used in Roofing and Waterproofing.

ASTM E2556/E2556M - Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment.

ICC-ES AC38 - Acceptance Criteria for Water Resistive Barriers.

* 1. Definitions

CMU: Concrete Masonry Unit.

WRB: Water Resistive Barrier.

Dimensions: All unit sizes are shown as Nominal Dimensions.

* 1. Administrative Requirements

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.
			7. Masonry Contractor.
	1. Informational SUBMITTALS

Submit under provisions of Section 01 30 00.

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.

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.

Warranty Information:

* + - 1. Submit confirmation and details of manufacturer’s warranty, extended warranty, and replacement policies.

Submit product data for each type of product specified, including certification that each type complies with specified requirements.

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.

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 (1m x 1m).
			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.
	1. Closeout SUBMITTALS

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

Delivery and Acceptance Requirements: Deliver CMUs and other cementitious materials neatly stacked and packaged on pallets. Store pallets in single stacks on level ground and protect from weather.

Deliver mortar materials in original unbroken, undamaged packages with labels intact and visible.

Store materials covered and off the ground until used on the Work in this section.

* 1. WARRANTY

Provide the manufacturer's standard form in which the specified manufacturer agrees tor replace products that fail to meet the ASTM standards within the specified warranty period.

* + - 1. Warranty Duration: \_\_\_\_\_\_ 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.

Basis of Design Manufacturer: Echelon, An Oldcastle Company.

* + - 1. Address: 400 Perimeter Center Terrace, Atlanta, GA 30046
			2. Phone: (770) 804 3363
			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.

Provide products meeting the requirements specified in this section, from one of the following manufacturers:

* + - 1. <Manufacturer>.

Substitution Limitations:

* + - 1. Submit substitution requests in accordance with provisions of Section 01 60 00.
	1. PERFORMANCE REQUIREMENTS

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.

Individual veneer units not to exceed 15 lbs./sq. ft. (saturated weight).

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.

Compressive Strength: Minimum 3500 psi with no individual specimen having a measured compressive strength less than 3000 psi.

Freeze-thaw durability: Meets or exceeds the requirements of ASTM C1262/C1262M -98 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.

* + 1. Freeze-Thaw Resistance: Meet or exceed the requirements of ASTM C1262.
		2. Abrasion Resistance: Meet or exceed the requirements of ASTM C744.
		3. Adhesion: Meet or exceed the requirements of ASTM C744.
		4. Color Change: Meet or exceed the requirements of ASTM C744.
		5. Resistance to Crazing: Meet or exceed the requirements of ASTM C744.
		6. Integral Water Repellant: Concrete Masonry Units must include an integral water repellant (IWR) admixture at the time of production.
	1. Water Resistive Barrier

[Specifier Notes] – ASTM D226, Type 1 (#15 felt) is the most commonly used weather barrier. retain one of the following four paragraphs.

Provide one layer of asphalt saturated building paper that conforms to ASTM D226, Type 1.

Provide one layer of asphalt saturated Grade D building paper complying with ICC-ES AC38.

Provide one layer of house wrap complying with ICC-ES AC38.

Provide one layer of WRB complying with ASTM E2556/E2556M.

* 1. Insulation

Expanded Polystyrene Insulation - Rigid, cellular thermal insulation conforming to the requirements of ASTM C578, Type I.

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

* 1. Concrete Veneer

General / Appearance: Integrally colored concrete stone veneer with appearance to resemble stone.

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

* + - 1. Basis of Design Product: **Cinco®** Brick, from Echelon.

[Specifier Notes] – Select specified finish from one of the following options.

Finish: As selected from the Manufacturer’s standard color palette.

Finish: Chesapeake Tan.

Finish: Fawn Blend.

Finish: Hampton Bay Blend.

* + - 1. Performance:

Compressive Strength: Minimum 3500 psi when tested in accordance with ASTM C1634.

Minimum Absorption by Weight: 10 lbs./cu. ft. (based on normal weight.)

Minimum Weight: 125 lbs./cu. ft.

* + - 1. Dimensions:

Depth: 4 inches.

Height: 4 inches.

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

Length: 8 inches.

Length: 10 inches.

Length: 12 inches.

Length: 14 inches.

Length: 16 inches.

General / Appearance: Integrally colored concrete stone veneer with appearance to resemble stacked stone.

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

* + - 1. Basis of Design Product: **Dufferin®** Stone, from Echelon.

[Specifier Notes] – Select specified finish from the following options.

Finish: As selected from the Manufacturer’s standard color palette.

Finish: Avondale.

Finish: Pewter.

Finish: Highlands.

Finish: Antique Ivory.

* + - 1. Performance:

Compressive Strength: 3500 psi when tested in accordance with ASTM C1634.

Minimum Absorption by Weight: 10 lbs./cu. ft. (based on normal weight.)

Minimum Weight: 125 lbs./cu. Ft.

* + - 1. Dimensions:

Depth: 3 1/2 inches.

Height: 4 inches.

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

Length: 12 inches.

Length: 16 inches.

Length: 20 inches.

General / Appearance: Integrally colored concrete stone veneer with appearance to resemble stacked stone.

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

* + - 1. Basis of Design Product: **Lamina®** Stone, from Echelon.

[Specifier Notes] – Select specified finish from the following options.

Finish: As selected from the Manufacturer’s standard color palette.

Finish: Avondale.

Finish: Pewter.

Finish: Highlands.

Finish: Antique Ivory

 [Specifier Notes] – Select specified face appearance from one of the following options.

* + - * 1. Face Appearance: Solid Units

Face Appearance: False Joint Units

* + - 1. Performance:

Compressive Strength: Minimum 3500 psi when tested in accordance with ASTM C1634.

Minimum Absorption by Weight: 10 lbs./cu. ft. (based on normal weight.)

Minimum Weight: 125 lbs./cu. ft.

* + - 1. Dimensions:

Depth: 4 inches.

Height: 4 inches.

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

Length: 8 inches.

Length: 12 inches.

Length: 16 inches.

Length: 20 inches.

General / Appearance: Natural, hand-cut and weathered stone appearance with antiqued edges and textured face.

* + - 1. Basis of Design Product: **Waterford Stone™**, 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.

Finish: As selected from the Manufacturer’s standard color palette.

Finish: Cabernet.

Finish: Dogwood.

Finish: Wheat.

* + - 1. Performance:

Compressive Strength: Minimum 3500 psi when tested in accordance with ASTM C1634.

Minimum Absorption Range by Weight: 10 lbs./cu. ft. (based on normal weight.)

Minimum Weight: 125 lbs./cu. ft.

* + - 1. Dimensions:

Depth: 4 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.

Height: 4 inches.

Height: 7 inches.

Height: 12 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.

Length: 7 inches.

Length: 9 inches.

Length: 10 inches.

Length: 12 inches.

Length: 13 inches.

Length: 15 inches.

Length: 16 inches.

Length: 18 inches.

Length: 19 inches.

Length: 21 inches.

General / Appearance: Natural, hand-cut and weathered stone appearance with antiqued edges and textured face.

* + - 1. Basis of Design Product: **Aria Slim™** Stone, 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.

Finish: As selected from the Manufacturer’s standard color palette.

Finish: Alabaster.

Finish: Buff.

Finish: Graphite.

Finish: Limestone.

[Specifier Notes] – Select specified face appearance from one of the following options.

Face Appearance: Ground Face

Face Appearance: Shot Blast

Face Appearance: Ground Face and Sealed

Face Appearance: Shot Blast and Sealed

* + - 1. Performance:

Compressive Strength: Minimum 4000 psi when tested in accordance with ASTM C1634.

Minimum Absorption Range by Weight: 10 lbs./cu. ft. (based on normal weight.)

Minimum Weight: 125 lbs./cu. ft.

* + - 1. Dimensions:

Depth: 4 inches.

Height: 4 inches.

Length: 36 inches.

General / Appearance: Natural, hand-cut and weathered stone appearance with antiqued edges and textured face.

* + - 1. Basis of Design Product: **Bravissi™** Stone, 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.

Finish: As selected from the Manufacturer’s standard color palette.

Finish: Winter White.

Finish: Kasota Pink.

Finish: Kasota.

Finish: Brownstone.

Finish: Millstone Gold.

Finish: Tennessee.

Finish: Endion Red.

* + - 1. Performance:

Compressive Strength: Minimum 3500 psi when tested in accordance with ASTM C1634.

Minimum Absorption Range by Weight: 10 lbs./cu. ft. (based on normal weight.)

Minimum Weight: 125 lbs./cu. ft.

* + - 1. Dimensions:

Depth: 4 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.

Height: 4 inches.

Height: 8 inches.

Height: 12 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.

Length: 12 inches.

Length: 12 inches (with Finished Edge).

Length: 16 inches.

Length: 16 inches (with Finished Edge).

Length: 24 inches.

General / Appearance: Natural, hand-cut and weathered stone appearance with antiqued edges and textured face.

* + - 1. Basis of Design Product: **Mondrian®** Stone, 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.

Finish: As selected from the Manufacturer’s standard color palette.

Finish: Pearl.

Finish: Danville Beige.

Finish: Leuder’s Grey.

Finish: Cordova Buff.

Finish: Crab Orchard.

* + - 1. Performance:

Compressive Strength: Minimum 3500 psi when tested in accordance with ASTM C1634.

Minimum Absorption Range by Weight: 10 lbs./cu. ft. (based on normal weight.)

Minimum Weight: 125 lbs./cu. ft.

* + - 1. Dimensions:

Depth: 4 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.

Height: 12 inches

Height: 16 inches

Length: 24 Inches

* 1. MOrtar

[Specifier Notes] – In the following 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 lbs./in2, 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.

Provide site-mixed mortar that meets or exceeds the requirements of ASTM C270 Type N.

Provide site-mixed mortar that meets or exceeds the requirements of ASTM C270 Type S.

Provide pre-blended mortar that meets or exceeds the requirements of ASTM C1714/C1714M Type N.

Provide pre-blended mortar that meets or exceeds the requirements of ASTM C1714/C1714M Type S.

Mortar must include manufacturer approved compatible integral water repellent (IWR)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

Portland Cement: Conforming to ASTM C150 Type I, Type II or Type III as required to achieve optimal results based on ambient project conditions.

Hydrated Lime: Conforming to ASTM C207, Type S.

Aggregates: Conforming to ASTM C144 for mortar and ASTM C404 for grout.

Pigments: Conforming to ASTM C979. Comply with quantity limitations in referenced standards and from the pigment manufacturer.

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. Integral Water Repellant: Liquid polymeric, admixture that does not reduce flexural bond strength

Basis of Design Product: RainBloc® Integral Water Repellent (IWR) Masonry Unit admixture, manufactured by ACM Chemistries, Inc.

Water: Potable; Clean and drinkable.

* 1. Accessories

Keystones:

* + - 1. Basis of Design Product: Cordova Stone™ Keystone, from Echelon.
			2. Dimensions:

Depth: 2 inches.

Width: 6 inches at bottom, 8 inches at Top.

Height: 10 inches.

[Specifier Notes] – Select specified finish(es) from one of the following options.

* + - 1. Finish: Buff.
			2. Finish: Limestone.
			3. Finish: Midnight.

[Specifier Notes] – Select specified face appearance from one of the following options.

* + - 1. Face Appearance: Smooth
			2. Face Appearance: Shot Blast
			3. Face Appearance: Ground Face and Sealed

Trim Stones:

* + - 1. Basis of Design Product: Cordova Stone™ Trim Stone, from Echelon.
			2. Dimensions:

Depth: 2 inches.

Width: 6 inches.

Height: 8 inches.

 [Specifier Notes] – Select specified finish(es) from one of the following options.

* + - 1. Finish: Buff.
			2. Finish: Limestone.
			3. Finish: Midnight.

[Specifier Notes] – Select specified face appearance from one of the following options.

* + - 1. Face Appearance: Smooth
			2. Face Appearance: Shot Blast
			3. Face Appearance: Ground Face and Sealed

Sill / Water Table:

* + - 1. Basis of Design Product: Cordova Stone™ Sloped Sill, from Echelon.
			2. Dimensions:

Depth: 2 inches.

Width: 6 inches.

Height: 3 inches at back, 2 3/16 inches at front.

 [Specifier Notes] – Select specified finish(es) from one of the following options.

* + - 1. Finish: Buff.
			2. Finish: Limestone.
			3. Finish: Midnight.

[Specifier Notes] – Select specified face appearance from one of the following options.

* + - 1. Face Appearance: Smooth
			2. Face Appearance: Shot Blast
			3. Face Appearance: Ground Face and Sealed
1. Execution
	1. Examination

Verify that site conditions are properly prepared to receive concrete masonry units.

Verify that bearing elements are within tolerances conforming to the requirements of ACI 117.

Verify that locations of penetrations, projections and built-in items are correct and properly prepared for work specified in this section.

Provide adequate lighting for masonry work by placing all lighting at a reasonable distance from the wall for even illumination.

* 1. Preparation

Proceed with installation only after substrate(s) are been properly prepared and within tolerances recommended by the manufacturer.

Install through-wall flashing over exterior windows, relieving angles, doors, tops of walls, at the inside base of cavity walls, and under sills.

Commencement of installation constitutes acceptance of site conditions.

Draw veneer from more than one pallet at a time during installation.

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

Refer to NCMA TEK Notes, for hot and cold weather construction practices.

* 1. Water Resisitive Barrier

Install a water resistive barrier starting at the bottom of the wall, overlapping the flashing and working upward.

Overlap horizontally 2 to 4 inches and vertically a minimum of 6 inches in a water shedding fashion.

Overlap Inside and outside corners a minimum of 16 inches.

* 1. Detailing, Flashing, AND CONTROL JOINTS

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.

Control Joints: Designer to determine if and where control joints are needed and identify locations. 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.

* 1. Insulation Installation

Coordinate the installation of continuous insulation (CI) with Work specified in Section 07 21 13.

* 1. Veneer Installation

General:

* + - 1. 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.
			2. Install concrete veneer in accordance with industry accepted masonry practices and manufacturer's instructions.
			3. Do not use veneer units with broken corners and edges.
			4. Construct forms as required to adequately and safely support installed Work until mortar has cured.

Placing and Anchoring:

* + - 1. Coordinate placement and pattern of veneer installation with the locations specified in the construction drawings and installation details related to the Work specified in this section.
			2. Provide a nominal 1 to 1 ½ inch airspace between the veneer and the outermost layer of the wall receiving the Work.
			3. Provide wire anchors or adjustable anchors spaced no greater than 16 inches on center vertically and horizontally.
			4. Within 8 inches of transitions, terminations and openings in the wall, decrease anchor spacing to no greater than 12 inches on center vertically and horizontally.

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.

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. Raked joints are not permitted and will be considered defective work.

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

Weeps and Vents: Galvanized steel, plastic tubes, corrugated plastic cell vents or spun polymer drain mesh vents. Install weeps or 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.

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* 1. Inspection and Cleaning

Faces must conform to the requirements of ASTM C90 when viewed from twenty (20) feet at right angles to the wall with normal lighting.

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.

Refer to Manufacturers recommendations for cleaning instructions for installed veneers.

End of Section