tents to create a controlled environment suitable for proper bonding and curing.

3. Completed Work and Work Not in Progress:

a. Mean daily air temperature of 40 degrees F to 32 degrees F: Protect masonry from rain and snow for 24 hours by covering with a weather-resistive membrane.
b. Mean daily air temperature of 32 degrees F to 25 degrees F: Cover masonry with a weather-resistive membrane for 24 hours.
c. Mean daily air temperature of 25 degrees F to 20 degrees F: Cover masonry with insulating blankets for 24 hours.

H. Hot Weather Procedures:

1. When ambient temperature exceeds 90 degrees F and wind exceeds 8 miles per hour:

a. Maintain temperature of mortar and grout between 70 degrees F and 120 degrees F.
b. Limit the spread of the mortar bed to 4 feet and place units within 1 minute of spreading mortar.
c. Control moisture evaporation in partially or newly completed walls by fog spraying with potable water, covering with opaque plastic or canvas or both.

I. Protection of Work in Progress:

1. Covering:

a. Cover tops of walls with a strong waterproof membrane at the end of each day or work shutdown.
b. Extend the waterproof membrane cover a minimum of 24 inches down the side of each wall.
c. Hold cover securely in place.

2. Load Application:

a. Do not apply uniform floor or roof loading for at least 12 hours after completing columns and walls.
b. Do not apply concentrated loads for at least 3 days after completing columns and walls.

3. Staining:

a. Prevent grout and mortar from staining the face of masonry.
b. Remove grout and mortar that comes in contact with masonry units immediately. c. Protect sills, ledges and projections from mortar droppings.
d. Protect base of wall from rain-splashed mud and mortar splatter.
e. Turn scaffold boards on edge when work is not in progress to lessen splattering.

3.4 CLEANING

A. Cut out defective mortar joints and holes in exposed masonry and re-point with mortar. B. Clean a sample wall area. Do not proceed with cleaning without Architect's approval.
C. Clean brick in accordance with BIA Technical Note Number 20 and the proprietary cleaning product manufacturer's recommendations.

END OF SECTION 042113

SECTION 047000 MANUFACTURED MASONRY

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Manufactured brick veneer, Manufactured stone trim,and application materials.

B. Related Sections:
1. Division 05, or 06 Section specifying water resistive barrier over framed walls.
2. Division 07 Section specifying flashing materials.
3. Division 09 Section specifying Portland cement plastering.

1.02 REFERENCES

A. American Concrete Institute (ACI).

B. American Society for Testing and Materials (ASTM):
1. ASTM C 39, Standard 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 177, Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
4. ASTM C 192, Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.
5. ASTM C 270, Standard Specification for Mortar for Unit Masonry.
6. ASTM C 482, Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement.
7. ASTM D 226, Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
8. ASTM E 2556/ E 2556M Standard Specification for Vapor Permeable Flexible Sheet Water Resistive Barriers Intended for Mechanical Attachment.

C. Building Materials Evaluation Commission.

D. International Code Council (ICC):
1. ES Report.
2. UBC Standard No. 14-1, Kraft Waterproof Building Paper.

E. LEED: US Green Building Council's Leadership in Energy and Environmental Design Green Building Rating System™.

F. Masonry Standards Joint Committee (MSJC) of The Masonry Society. G. Texas Department of Insurance Product Evaluation.
H. Underwriters Laboratories (UL):
1. Classification File Number
2. UL 723, Standard for Safety for Surface Burning Characteristics of Building Materials. I. US Department of Housing and Urban Development (HUD): Material Release Number

1.03 SUBMITTALS

A. Reference Section 01 33 00–Submittal Procedures; submit following items:
1. Product Data: Manufactured masonry and application materials including mortar color charts and water resistive barrier.
2. Samples: Panel containing full size samples of specified manufactured masonry showing full range of colors and textures complete with specified mortar.
a. Actual size of masonry sample approximately 12 by 12 inches (300 by 300 mm).
3. Quality Assurance/Control Submittals:
Qualifications:
1) Proof of manufacturer qualifications.
2) Proof of installer qualifications.
b. Certificates: ICC-ES Report.
c. Test Reports for physical properties.
d. Manufacturer's Installation Instructions.
4. LEED Submittals:
a. Credit MR 5.1 Local/Regional Materials: Indicate location of manufacturer of manufactured masonry and distance from manufacturer to project site.

B. Closeout Submittals: Reference Section 01 78 00–Closeout Submittals; submit following items:
1. Maintenance Instructions.
2. Special Warranties.

1.04 QUALITY ASSURANCE A. Qualifications:
1. Manufacturer Qualifications:
a. Minimum five years experience in producing manufactured masonry.
b. Member of following organizations:
1) MSJC.
2) ACI.
3) ASTM.

2. Installer Qualifications: Company with documented experience in installation of manufactured masonry including minimum 5 projects within 400 mile radius of this Project.

B. Certifications:
1. Current ICC-ES Report.
2. UL: Classification File Number.
3. Building Materials Evaluation Commission.
4. HUD: Material Release Number
5. Texas Department of Insurance Product Evaluation.
6. Florida Product Approval Number.

C. Field Samples: Provide in a location selected by Architect showing representative sample of installed product including penetration and termination details, corner detail, and mortar color and tooling.
1. Reference Section 01 45 00 – Quality Control.
2. Minimum Size: [4 by 4 feet (1200 by 1200 mm)]
3. Approved field samples may remain as part of completed Work

1.05 DELIVERY, STORAGE, AND HANDLING

A. Reference Section 01 66 00–Product Storage and Handling Requirements.
B. Follow manufacturer's instructions.
C. Store moisture-sensitive materials in weather protected enclosures.

1.06 PROJECT/SITE CONDITIONS

A. Environmental Requirements: Maintain materials and ambient temperature in area of installation at minimum 40 degrees F (4 degrees C) prior to, during, and for 48 hours following installation.

1.07 WARRANTY

A. Special Warranty: Provide manufacturer's standard limited warranty against defects in manufacturing for a period of 50 years following date of [Substantial Completion] [Final Acceptance].

1.08 MAINTENANCE

A. Extra Materials: Furnish extra manufactured stone material in a variety of shapes and sizes in quantity equal to three percent of the installed stone.

PART 2—PRODUCTS

2.01 MANUFACTURER

A. BORAL, CULTURED STONE

B. Substitutions: SubstitutionS will be considered

2.02 MANUFACTURED MASONRY MATERIALS - REFERENCE ELEVATIONS AND/OR COLOR RENDERING FOR MANUFACTURED MASONRY TYPE, STYLE AND COLOR

A. Manufactured Masonry Physical Properties:
1. Compressive Strength: ASTM C 192 and ASTM C 39, 1800 psi (12.4 MPa)
2. Bond Between Stone Unit, Type S Mortar, and Backing: ASTM C 482, 50 psi (345 kPa).
3. Thermal Resistance: ASTM C 177, R-factor, 0.355 per inch (25.4 mm) of thickness.
4. Freeze/Thaw: ASTM C 67, 50 cycles, no disintegration and less than 3 percent weight loss.
5. Fire Hazard Test, UL 723:
a. Flame spread: 0.
b. Smoke Development: 0.
6. Maximum Veneer Unit Weight: 15 psf (73 kg/m^2).

2.03 RELATED MATERIALS

A. Water Resistive Barrier: [Kraft waterproof building paper, UBC Standard No. 14-1] [No. 15, Type I, asphalt saturated felt, ASTM D 226]. [Vapor permeable flexible sheet water resistive barriers comply with ASTM E 2556/ E 2556M]

B. Metal Lath: [2.5 lb (1.4 kg/m^2) galvanized expanded metal lath] [18 (1.3 mm) gauge woven wire mesh] [3.4 lb (1.8 kg/m^2) galvanized expanded rib lath].

C. Fasteners:
1. Into Wood Studs: Minimum 1/8 inch (25 mm) shank diameter galvanized nails or minimum 3/4 inch (19 mm) crown staples of sufficient length to penetrate 1 inch (25 mm) minimum into the stud.
2. Into Metal Studs: Minimum 7/16 inch (11.1 mm) head diameter, corrosion-resistant , self-drilling, self tapping, pancake head screws of sufficient length to penetrate 3/8 inch (10 mm) minimum into the stud.

D. Mortar: Premixed Type N, Type S or mortar mixed using components and proportions following manufactured masonry manufacturer's installation instructions. Comply with ASTM C 270.
1. Mortar Color: Iron oxide pigments.

E. Weep screed as required for installation over framed construction.

PART 3—EXECUTION

3.01 EXAMINATION

A. Examine substrates upon which manufactured masonry will be installed. B. Coordinate with responsible entity to correct unsatisfactory conditions.
C. Commencement of work by installer is acceptance of substrate conditions.

3.02 PREPARATION

A. Protection: Prevent work from occurring on the opposite of walls to which manufactured masonry is applied during and for 48 hours following installation of the manufactured masonry.

B. Surface Preparation: Follow manufacturer's instructions designated below for the appropriate type of manufactured masonry and substrate.

3.03 INSTALLATION

A. Install Cultured Stone® products in accordance with manufacturer's Cultured Stone® installation instructions using joints as called for on the elevations and/or color rendering. If not specified, notify architect and ask for grouted or tight fit joints.

B. Install Cultured Brick® products in accordance with manufacturer's Cultured Brick® installation instructions.

C. Install architectural trim products in accordance with manufacturer's Cultured Stone® installation instructions.

D. Install [illegible] Materials specified above in accordance with type of substrate and manufactured masonry manufacturer's installation instructions.

3.04 FIELD QUALITY CONTROL

A. Manufacturer's [illegible]. Provide periodic site visits.

3.05 CLEANING

A. Reference Section 01 74 00–Cleaning and Waste Management.

B. Clean manufactured masonry in accordance with manufacturer's installation instructions.

3.06 PROTECTION

A. Protect finished work from rain during and for 48 hours following installation. B. Protect finished work from damage during remainder of construction period.

END OF SECTION 047000

SECTION 04810 - UNIT MASONRY ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes unit masonry assemblies consisting of the following:
1. Concrete masonry units.

1.2 SUBMITTALS

A. Product Data: For each masonry unit, accessory, and other manufactured product indicated.

B. Samples: Showing the full range of colors and textures available for exposed masonry units and colored mortars.

C. Material Test Reports: For each type of masonry unit, mortar, and grout required.

1.3 PROJECT CONDITIONS

A. Cold-Weather Requirements: Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements in ACI 530.1.

B. Hot-Weather Requirements: When ambient temperature exceeds 100 deg F, or 90 deg F with a wind velocity greater than 8 mph, do not spread mortar beds more than 48 inches ahead of masonry. Set masonry units within one minute of spreading mortar.

PART 2 - PRODUCTS

2.1 COLORS AND TEXTURES

A. Exposed Masonry Units: As selected from manufacturer's full range.

2.2 MASONRY UNITS

A. Concrete Masonry Units: ASTM C 90.
1. Unit Compressive Strength: 1900-psi minimum, average net-area compressive strength.
2. Weight Classification: Normal weight.
3. Type: II, nonmoisture-controlled units.
4. Exposed Faces of Decorative Units: Normal-weight aggregate, split-face finish
5. Special Shapes: Provide for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.

2.3 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I, except Type III may be used for cold-weather construction.

B. Hydrated Lime: ASTM C 207, Type S.

C. Mortar Cement: ASTM C 1329.
1. Products:

a. Blue Circle Cement; Magnolia Superbond Mortar Cement.
b. Lafarge Corporation; Lafarge Mortar Cement.

D. Masonry Cement: ASTM C 91

E. Pigmented Mortar: Colored cement or cement-lime formulation as required to produce the color indicated.
1. Colored Masonry Cement:

a. Products:

1) Blue Circle Cement; Magnolia Masonry Cement.
2) Essroc Materials, Inc.; Brixment-in-Color.
3) Holnam, Inc.; Rainbow Mortamix Custom Color Masonry Cement.

F. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.

G. Aggregate for Grout: ASTM C 404.

H. Water: Potable

2.4 REINFORCING

A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M; ASTM A 616/A 616M, including Supplement [illegible] or ASTM A 617/A 617M, Grade 60.

B. Masonry Joint Reinforcement: ASTM A 951; mill galvanized, carbon-steel wire for interior walls and hot-dip galvanized, carbon-steel wire for exterior walls.
1. Single-Wythe Masonry: Use either ladder or truss type with single pair of side rods and cross rods spaced not more than 16 inches o.c.

C. Adjustable Anchors for Connecting to Steel Frame: Two-piece assemblies that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to wall.
1. Anchor Section: Crimped 1/4-inch diameter, galvanized steel wire anchor section for welding to steel.
2. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch of masonry face, made from 0.1875-inch- diameter, galvanized steel wire.

D. Anchors for Connecting to Concrete: Provide two-piece assemblies that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to wall.
1. Anchor Section: Dovetail anchor section formed from 0.0528-inch- thick galvanized steel sheet.
2. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch of masonry face, made from 0.1875-inch- diameter, galvanized steel wire.

2.5 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; [illegible] neoprene.

B. Preformed Control-Joint Gaskets: Designed to fit standard sash block and to maintain lateral stability in masonry wall. Made from styrene-butadiene-rubber compound complying with ASTM D 2000, Designation [illegible]-805.

C. Bond-Breaker Strip: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

2.6 MASONRY CLEANERS

A. Job-Mixed Detergent Solution: Solution of 1/2-cup dry measure tetrasodium polyphosphate and 1/2-cup dry measure laundry detergent dissolved in 1 gal. of water.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cut masonry units with motor-driven saws. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

B. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

C. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and the following:
1. For conspicuous vertical and horizontal lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/4 inch in 20 feet, nor 1/2 inch maximum.

3.2 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Lay exposed masonry in bond pattern indicated; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

C. Fill cores in hollow concrete masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

3.3 MORTAR BEDDING AND JOINTING

A. Lay hollow masonry units as follows:
1. With full mortar coverage on horizontal and vertical face shells.
2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.

B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than the joint thickness, unless otherwise indicated.

3.4 MASONRY JOINT REINFORCEMENT

A. Provide continuous masonry joint reinforcement as indicated. Install with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.

B. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections.

3.5 ANCHORING MASONRY

A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:
1. Provide an open space not less than 1 inch in width between masonry and structural member, unless otherwise indicated.
2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.

3.6 LINTELS

A. Provide masonry lintels where shown. Provide precast lintels made from concrete matching concrete masonry units in color, texture, and compressive strength and with reinforcing bars indicated or required to support loads indicated.

3.7 FIELD QUALITY CONTROL

A. Owner will engage a qualified independent testing agency to perform field quality-control testing indicated below.
1. Testing Frequency: Tests and Evaluations listed in these subparagraphs will be performed during construction for each 5000 sq. ft. of wall area or portion thereof.
2. Mortar: Properties will be tested per ASTM C 780.
3. Grout: Sampled and tested for compressive strength per ASTM C 1019.

3.8 PARGING

A. Parge predampened masonry walls, where indicated, with Type S or Type N mortar applied in 2 uniform coats to a total thickness of 3/4 inch with a steel-trowel finish. Form a wash at top of parging and a cove at bottom. Damp-cure parging for at least 24 hours.

3.9 CLEANING

A. Clean unit masonry by dry brushing to remove mortar fins and smears before tooling joints, as work progresses.

END OF SECTION 04810

SECTION 05120 - STRUCTURAL STEEL

REFER TO STRUCTURAL PLANS

END OF SECTION 05120

SECTION 05210 - STEEL JOISTS

REFER TO STRUCTURAL PLANS

END OF SECTION 05210

SECTION 05310 - STEEL DECK

REFER TO STRUCTURAL PLANS

END OF SECTION 05310

SECTION 05400 - COLD-FORMED METAL FRAMING

REFER TO STRUCTURAL PLANS

END OF SECTION 05400

SECTION 05500 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
1. Steel ladders.
2. Miscellaneous steel framing and supports.
3. Pipe bollards.

1.2 SUBMITTALS

A. Shop Drawings: Include plans, elevations, sections, details of installation, and attachments to other Work.

B. Templates: For anchor bolts.

PART 2 - PRODUCTS

2.1 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces without blemishes.

B. Ferrous Metals:
1. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
2. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.
3. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.
4. Rolled-Stainless-Steel Floor Plate: ASTM A 793.
5. Steel Tubing: Cold-formed steel tubing complying with ASTM A 500.
6. Steel Pipe: ASTM A 53, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.
7. Slotted Channel Framing: Cold-formed metal channels 1-5/8 by 1-5/8 inches with flange edges returned toward web and with 9/16-inch- wide slotted holes in webs at 2 inches o.c. Channels made from galvanized steel complying with ASTM A 653/A 653M, structural quality, Grade 33, with G90 coating; 0.079-inch nominal thickness.
8. Extrusions: ASTM B 221, alloy 6063-T6.

2.2 PAINT

A. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with performance requirements in FS TT-P-664 and compatible with finish paint systems indicated.

2.3 FABRICATION

A. Connections, General: Use connections that maintain structural value of joined pieces.
1. Shear and punch metals cleanly and accurately. Remove burrs.
2. Weld corners and seams continuously. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. Obtain fusion without undercut or overlap. Remove welding flux immediately. Finish exposed welds smooth and blended.
3. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes.
4. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.

B. Steel Ladders: Comply with ANSI A14.3, unless otherwise indicated.
1. Siderails: Continuous, 1/2-by-2-1/2-inch steel flat bars, with eased edges, spaced 18 inches apart.
2. Bar Rungs: 3/4-inch- diameter steel bars, spaced 12 inches o.c.

a. Fit rungs in centerline of side rails; plug-weld and grind smooth on outer rail faces.
4. Support each ladder at top and bottom and not more than 60 inches o.c. with welded or bolted steel brackets. Size brackets to support design loads specified in ANSI A14.3.
5. Fabricate ladder safety cages to comply with ANSI A14.3. Assemble by welding or riveting.
6. Galvanize exterior ladders and safety cages.

C. Miscellaneous Framing and Supports: Fabricate steel framing and supports that are not a part of structural-steel framework as necessary to complete the Work from structural steel of welded construction. Cut, drill, and tap units to receive hardware, hangers, and similar items.
1. Where indicated to be cast into concrete or built into masonry, equip with integrally welded anchors at 24 inches o.c.
2. Fabricate steel girders for wood frame construction from continuous steel shapes. Where wood nailers are attached to girders with bolts or lag screws, drill holes at 24 inches o.c.
3. Fabricate steel pipe columns for supporting wood frame construction with steel baseplates and top plates welded to pipe with fillet welds the same size as pipe wall thickness.

D. Pipe Bollards: Fabricate from Schedule 40 steel pipe.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Provide anchorage devices and fasteners for securing metal fabrications to in-place construction. Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, with edges and surfaces level, plumb, and true.
1. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
2. Fit exposed connections accurately together. Weld connections, unless otherwise indicated. Do not weld, cut, or abrade galvanized surfaces.

B. Set bearing and leveling plates on cleaned surfaces using wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts and pack with nonshrink, nonmetallic grout.

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Specifications

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DATE 07-26-18
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