Editing Specifications

PRODUCT GUIDE SPECIFICATION

This section must be carefully reviewed and edited by the Architect to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the drawings.

047300

LIGHTWEIGHT STONE MASONRY UNITS

SECTION 1

1.1 SUMMARY:

A. Work of this section includes manufacturing, structural design, transport, erection, and cleaning of lightweight stone masonry units.

B. Related sections:
   1. Cement Plaster
   2. Concrete unit masonry
   3. Exterior insulation and finish system
   4. Flashing
   5. Sealant
   6. Cast Stone
   7. Sheathing
   8. Structural Light Gauge Metal Framing
   9. Thin Brick
   10. Brick Veneer

C. Definitions:
   1. Lightweight Stone Masonry Units: An architectural stone unit manufactured over a 1lb. EPS Foam Core to imitate fine grain texture and color of natural cut stone used in unit stone applications. Ideal installation applications are where there are no masonry ledges or steel to carry full masonry and the project design requires the look of full masonry cast stone. In addition, the product is ideally utilized in a thin/adhered application with other manufactured stone, thin brick and/or brick products; and where masonry unit trim is required. It is able to withstand extreme weathering conditions.

   2. Wet Casting Method: Manufactured from measurable slump concrete and consolidated into a mold with a 1 lb. EPS Foam Core.

1.2 REFERENCES:

A. ASTM International (ASTM):
   1. C 1364: Standard Specification for Architectural Cast Stone
      a. C1194: Compressive Strength of Architectural Cast Stone
      b. C1195: Absorption of Architectural Cast Stone
      c. C426: Linear Drying Shrinkage for Architectural Cast Stone
      d. C666: Freeze-Thaw for Architectural Cast Stone
      e. ASTM C231 Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

2. Additional Testing:
   a. ASTM E488: Standard Test Method for Strength of Anchor in Concrete Elements
   b. ASTM E831-06: Standard Test Method for Linear Thermal Expansion of Solid Materials by Thermomechanical Analysis.
   c. ASTM E84-10b: Standard Test Method for Surface Burning Characteristics of Building Materials
   d. NFPA 285: Standard Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load Bearing Wall Assemblies Containing Combustible Components, 2019 Edition
   e. ASTM C348: Flexural Strength of Hydraulic-Cement Mortars
   f. ASTM C39: Compressive Strength of Cylindrical Hydraulic-Cement Mortars

1.3 PERFORMANCE REQUIREMENTS:

A. Lightweight Stone Masonry Units shall resist wind load pressures for cladding in applicable building code, latest edition. **Florida Product Approval # FL35386**

B. Design wind speed and zone shall be indicated on drawings.

C. Lightweight Stone Masonry Units manufacturer shall design reinforcement and connections for lightweight Stone Masonry Units, including additional reinforcement and lifting devices required to withstand loads due to lifting, transporting, handling, erection, and related anchorage components.

1.4 SUBMITTALS:

A. Comply with Section 013300 – Submittal Procedures

B. Product Data: Submit manufacturer's product data and warranty

C. Shop Drawings: Submit manufacturer's shop drawings, including profiles, cross sections, modular unit lengths, reinforcement (if required), exposed faces, anchors and anchoring method recommendations and annotation of lightweight stone masonry unit types and location.

D. Samples: Submit pieces of manufacturer's lightweight stone masonry units that represent general range of texture and color proposed to be furnished for project.

1.5 QUALITY ASSURANCE:

A. Manufacturer Qualifications:
   1. Sufficient plant facilities to provide quality, shapes, quantities, and sizes of lightweight stone masonry units required without delaying progress of the work.

   2. Manufacturer shall have an internal quality control program and a third-party assurance program as stated in TER 1909-03 - Section 9.8.

1.6 DELIVERY, STORAGE AND HANDLING:

A. Delivery:
   1. Deliver units secured to shipping pallets and protected from damage and discoloration.

   2. Provide itemized shipping list.

3. Number each piece individually, as required, to match shop drawings and schedules.

4. Reject damaged units upon delivery & notify manufacturer.

B. Storage:
   1. Store units and installation materials in accordance with manufacturer's instructions.

   2. Store units on pallets with non-staining covers. Do not store in direct contact with earth.

   3. Do not double stack pallets.

   4. Ventilate units under covers to prevent condensation.

   5. Prevent contact with dirt and splashing.

   6. Store units' level, firm, and on smooth surfaces

C. Handling:
   1. Protect units, including corners and edges, during storage, handling, and installation to prevent chipping, cracking, staining, or other damage.

   2. Cautious using pry bars or other equipment in a manner that could damage units.

1.7 SCHEDULING:

A. Schedule and coordinate production and delivery of units with unit masonry work.

SECTION 2

2.1 MANUFACTURER:

A. Basis of Design: Subject to compliance with requirements, provided by Piazza Stoneworks, Piazza Stone, LLC. (706) 651-1210. Manufacturers are as follows:

Advanced Architectural Stone
115 Lee St. Fort Worth, TX 76140
(O) 817-572-0018 (F) 817-293-6378
Website: www.advancedarchitecturalstone.com
Email: sales@advancedarchitecturalstone.com

Reading Rock, Inc.
4600 Devitt Drive Cincinnati, OH 45246
(O) (800) 482-6466 (F) (513) 874-2361
Website: www.readingrock.com
Email: info@readingrock.com

B. Other manufacturers must be approved by the Architect at least 7 days prior to bid date.

2.2 LIGHTWEIGHT STONE MASONRY UNIT MATERIALS:

A. Portland Cement: Meeting ASTM C150, Type I or IIIA, white and/or gray color. Use only one brand of cement for all units.

B. Coarse Aggregates: ASTM C33, except for gradation. Granite, quartz, or limestone.

C. Fine Aggregates: ASTM C33, except for gradation. Granite, quartz, or limestone.

D. Pigments: ASTM C979, except do not use carbon black pigments. Inorganic iron oxide pigments.

E. Core: 1 lb. EPS Foam

F. Admixtures: Plastification, Water Reduction

G. Water: Clean, potable, free of alkali, acid, oil, or organic matter.

2.3 CURING:

A. Demolding shall not occur for a minimum of sixteen (16) hours. Additional time may be needed for environmental conditions that retard the curing process. Masonry units should be demolded in the sequence they were cast to promote uniformity in color and texture.

B. Demolded masonry units shall be stored in the same controlled environment as poured, on a flat and level surface for a minimum of three (3) days before packing. After three (3) days masonry units can be loaded onto pallets. Demolded masonry units shall not be placed on a cement floor or other moisture-depleting surfaces.

C. Surface finishing should occur within one (1) hour of demolding to ensure consistent quality and texture.

D. Masonry units must have a minimum curing time of seven (7) days before being shipped.

2.4 MANUFACTURED UNITS:

A. Lightweight Stone Masonry Units shall comply with physical requirements of ASTM C1364. It is a stone shell surrounding a 1 lb. expanded polystyrene (EPS) core. The stone shell includes the front, top, bottom & both ends of all units. It should wrap at least 1" onto the back of all units. For the interior and exterior applications where fire codes may apply, the exposed EPS must be completely covered by a minimum of ¼" of Piazza Adhesive.

1. Recommended Shell thickness is 5/8". Size and shape of element will determine thickness.

2. To meet ASTM488 with Piazza-Con Hex Washer Concrete Screws Dagger-Guard coating, the area in which receives attachment must be minimum 1" thick.
   Screw Sizes: 3/16" x 1 ¼", 3/16" x 1 ¾, ¼" x 1 ¼", ¼" x 1 ¾"

3. Manufacture 90 degree outside corner returns and inside corner reprises as a single unit, without the use of field cut miters. Field cut miters are not acceptable unless reviewed and decided by manufacturer.

4. Exposed top surfaces of exterior sills, copings and projecting courses and units shall have sloped wash.

5. Projecting units' such as bulkheads and soffits shall have a drip reveal under outer edge.

6. Large profiles requiring multiple pieces shall use water management concept with higher unit lapping over lower unit. (visually appear as 1 unit)

7. **Maximum Lightweight Stone Masonry Unit Parameters to meet compliance with NFPA 285:** Based on the test assembly, any decorative piece of any reasonable shape may be allowed as long as either condition below is met:

    A. The per foot volume does not exceed 3,456 cubic inches per ft of length.
    B. The per food cross sectional area does not exceed 288 square inches.

A. Physical Properties Data Test Results:
    1. Compression strength: 6,850 PSI when tested 28 days after manufacturing in accord with ASTM C1194

    2. Absorption: 2.7% when tested at 28 days after manufacturing in accord with ASTM C1195

    3. Linear Drying Shrinkage: -0.151 @ 47 days in accord with ASTM C426

    4. Freeze and Thaw: Cumulative percent mass loss 0.5% when tested in accordance with ASTM C666

    5. Air Content: 9.5% in accord with ASTM C231

    6. Standard Test Method for Strength of Anchor in Concrete Elements (ASTM E488) – Tensile 553 lbs. Shear 369 lbs.

    7. Linear Thermal Expansion by Thermomechanical Analysis: When tested in accordance with ASTM E794-6 : ASTM E831-06 : for Precast Architectural Cement Stone is $3.165x10^{-6}$ in/in °F. (Shrinkage is less than .0063% of unit length in its service life.)

    8. Surface Burning Characteristics of Building Materials – Interior (ASTM E84-10b) Passed

    9. Fire Propagation Characteristics of Building Materials – Exterior (NFPA 285) Passed

    10. Flexural Strength of Hydraulic-Cement Mortars – (ASTM C348) 1,177 PSI

    11. Compressive Strength of Cylindrical Hydraulic-Cement Mortars – (ASTM C39) 6,311 PSI

2.5 TEXTURE AND COLOR:

A. General: Match texture and color to sample on file with Architect.

B. Texture of Surfaces Exposed to View:
   1. Fine-grained texture similar to natural stone
   2. Approximately equal to the approved sample when viewed in direct daylight at 10 feet.

C. Surface Air Voids:
   1. Size: Maximum 1/32”

   2. Less than 3 occurrences per any 1 square inch

   3. Viewing Conditions: Not obvious under direct daylight at 10 feet.

D. Finish:
   1. Minor chipping resulting from shipping and delivery shall not be grounds for rejection of units.

   2. Minor chips shall not be obvious under direct daylight at 20 feet, as determined by Architect.

E. Color Variation:
   1. Viewing Conditions: Compare in direct daylight at 10 feet, between units of similar age, subjected to similar weathering conditions.

   2. Total Color Difference: ASTM C1364, 6 units

   3. Hue Difference: ASTM C1364, 2 units

2.6 ACCESSORIES:

A. Adhesive for Lightweight Stone Masonry Units:
   1. Acceptable Product: Piazza Adhesive or approved equal
   2. Acceptable Substrates:

      a. Air & Weather Barrier applied to:

         1. DensGlass Gold
         2. Fiberock Aqua-Tough sheathing
         3. Water-resistant core gypsum sheathing
         4. New and untreated Exposure 1 exterior grade plywood or Exposure 1 OSB

      b. Cement Board
      c. ½” stucco mix over lath
      d. Unpainted and unglazed concrete or unit masonry

   3. Environmental Conditions: Air and surface temperature for application of adhesive shall be 40 degrees F or higher and shall remain so for a minimum of 24 hours after application.

B. Sealant for joints between lightweight stone masonry units and other substrates:

1. Acceptable Product: Pecora 890FTS-TXTR or equal

2. Characteristics:
   a. Type: One-part, non-sag, field tint able, textured silicone meeting ASTM C920, Type S, Grade NS, Class 100.

   b. Colors: Match Lightweight Stone Masonry Units color to Pecora color chart.

3. Joint size per Pecora's Applicable Standards is a minimum of 3/8" and a maximum of 1" with polyethylene backer rod.

4. **To meet compliance with NFPA 285:** Backer rod to be minimum 4# Delta Safing Board cut to 1" x 2" deep pieces compressed into 5/8" joints.

C. Piazza Connectors, Piazza Track System & Piazza Continuous Rigid Insulation Framing System:
1. Corrosion resistant

2. 54 – 97 mil minimum thickness, 50 ksi minimum yield, G90 minimum coating.

3. All systems above are required to be mechanically engineered with engineered stamp shown on shop drawings

D. Mechanical Fasteners:
Use fasteners per engineering-stamped approved shop drawings. All screws to be ASTM 117 corrosion resistance tested to 1,000 hours of salt-spray testing.

Note 1: For attachment of Piazza Track (PT-12-54) to metal studs, 18-gauge / 43 Mil metal minimum, approval from Engineer of Record required

Note 2: For attachment of Piazza Track (PT-12-54) to block, required to be solid.

2.8 PRODUCTION QUALITY CONTROL:

A. Lightweight Stone Masonry Units: Test in accordance with ASTM C1194 and C1195 by pouring three (3) test cubes 2" x 2" x 2" for each project to be tested if complication occurs in the field. Record batch numbers used for each project poured and store with cubes.

B. Manufacturer shall undergo periodic third-party inspections pertaining to compliance of the criteria defined in quality manual. Third-party inspections shall occur at a frequency of four (4) inspections per year and by an inspection body with ISO 17020 accreditation or alternative qualified expert with approval from Piazza Stone.

SECTION 3

3.1 EXAMINATION:

A. Examine construction to receive lightweight stone masonry units. Notify Architect if construction is not acceptable. Do not begin installation until unacceptable conditions have been corrected.

B. Examine lightweight stone masonry units before installation. Do not install unacceptable units.
   1. All Lightweight Stone Masonry products are shipped on a pallet and have finished faces designated on the shop tickets.

   2. Lightweight Stone Masonry Units do not have finished ends unless otherwise ordered.

3.2 INSTALLATION:

A. Installer qualifications:
   1. A jobsite training course is required to be a certified installer. Training and certifications must be handled prior to installation by **the manufacturer or Piazza Stone, LLC.**

   2. **If the installer does not meet certification and approval, all warranties will be VOID.**

B. Install Lightweight Stone Masonry Units in accord with manufacturer's product data and approved shop drawings. All Lightweight Stone Masonry Units are fastened with Piazza Adhesive, Piazza Connectors and/or Piazza Track per manufacturer's product data.
   1. Use non-staining resilient spacers between lightweight stone masonry units to maintain a minimum of 3/8" and maximum 1" between units. (Recommended 5/8". Most shop drawings from manufacturer will show 5/8")

   2. Mechanically attach every unit securely with a minimum of approved clips and fasteners per engineered stamped shop drawings.

   3. Setting drawings must be provided prior to installation to ensure unit is installed correctly. Drawings must include anchoring detailing and call out all necessary hardware as part of this submittal process.

   4. Install Piazza Connectors and/or Piazza Track system according to manufacturer's recommendations and as indicated on engineered stamped shop drawings.

   5. Application:
      a. Sealing back side of stone to meet NFPA 285 compliance.
         1. Using a trowel, apply Piazza approved adhesive to recessed back side of Lightweight Stone Masonry Unit ¼" thick. Let set until dry.

      b. Adhering to substrate (when necessary):
         1. Ribbon & Dab Method: Apply a ribbon of mixed Piazza approved adhesive approximately 1" x 1 ½" wide x 3/8" to 5/8" thick to entire perimeter of lightweight cast stone unit using a trowel. Apply dabs of 3/8" to 5/8" thickness by 4" in diameter, approximately 8" o.c. over entire backside of unit.

         2. Trowel Drainage Method: Apply mixed adhesive to entire surface vertically with ½" x ½" x ½" notched trowel

Note: Do not allow adhesive to form a skin before positioning lightweight cast stone unit to substrate.

6. CAUTION: Remove excess adhesive immediately, including spills, smears, and spatter, with clean water.

7. Immediately place Lightweight Stone Masonry Unit on substrate and slide into position and fasten Piazza Connectors according to manufacturer's recommendations.

8. **Projects installed without required adhesive, Piazza Connectors, and/or Piazza Track System, all product warranty will be void.**

C. Drying Time: When Lightweight Stone Masonry Units are bonded to an approved substrate, allow a period of 24 hours to elapse after application for adhesive to form a positive bond.
   1. The drying of Piazza approved adhesive is dependent on air temperature and relative humidity. Under average drying conditions (70 degrees F, 55% R.H.), protect work from rain for at least 24 hours.

   2. Lightweight Stone Masonry Units **shall not** be worked on while adhesive is curing.

3.3 PREPARATION:

A. Substrate surfaces must be clean, dry, structurally sound, and free of paint, efflorescence, grease, oil, form release agents and curing compounds.

3.4 INSTALLATION TOLERANCES:

A. Variation from Plumb: Do not exceed ¼" in 4 feet

B. Variation from Level: Do not exceed ¼" in 4 feet

C. Variation in Joint Width: Recommended 5/8", Minimum 3/8", Do not exceed 1"

D. Variation in Plane Between Adjacent Surfaces: Do not exceed 1/8" difference between planes of adjacent units or adjacent surfaces indicated to be flush with units.

3.5 ADJUSTING AND CLEANING:

A. Remove and replace stained and otherwise damaged units and units not matching approve samples. Lightweight Stone Masonry Units may be repaired if methods and results are approved by Architect.

B. Replace units in a manner that results in lightweight stone matching approved samples, complying with other requirements, and showing no evidence of replacement.

C. In-progress Cleaning:
   1. Clean units as work progresses.
   2. Remove excess sealant immediately, including spills, smears, and spatter, with clean water.

D. Final Cleaning: After sealants are thoroughly set and cured, clean units.

Cleaner: Prosoco Sure Klean Custom Masonry Cleaner, Prosoco Sure Klean 600 Detergent Prosoco Sure Klean Vana Trol, Prosoco Light Duty Cleaner or EaCo Chem NMD-80. If EaCo Chem NMD-80 is used follow their application process.

Note: Aggressive cleaners may remove too much of the concrete surface paste making some of the color appear "stripped". Therefore, on darker units a less aggressive cleaner such as a Prosoco's Light Duty Cleaner should be used to maintain color.

E. Clean units by wetting down the surfact first, before using the specified cleaner. Brush on cleaner, let dwell for 2 to 3 minutes. Reapply cleaner, scrub surface with masonry brush and rinse off thoroughly. Areas with heavy soiling use a wood block or non-metallic scraper.

F. Apply cleaner to units in accordance with cleaner manufacturer's instructions.

G. Do not use the following to clean units:
   1. Muriatic acid
   2. Power Washing
   3. Sandblasting
   4. Hard cleaning materials or methods that would damage or discolor surfaces

3.6 REPAIR:

A. Repair chips and other surface damage noticeable when viewed in direct daylight at 20 feet.

B. Repair with touchup materials provided by manufacturer in accordance with manufacturer's instructions. Send Patch Kit with first shipment of stone to jobsite. Sieve out the big aggregate and premix with appropriate pigment for certified installer to use. Follow Piazza patch guidelines.
See Product Information Manual Section 6L.

C. Repair methods and results to be approved by Architect.

3.7 INSPECTION AND ACCEPTANCE:

A. Inspect completed installation in accordance with contract documents and industry standards.

3.8 PROTECTION:

A. Protect installed units from splashing, stains, mortar, and other damage.

3.9 PORTAL INSTRUCTIONS:

1) GO TO WEBSITE: www.piazzastone.com
2) GO TO "RESOURCES"
3) CLICK ON "FOR DESIGNERS"
4) CLICK ON "CREATE ACCOUNT"
5) CLICK ON "DESIGNERS' SIGNUP"
6) FILL IN REQUIRED INFORMATION & CLICK CONTINUE
7) POP-UP: A SITE ADMIN STILL NEEDS TO APPROVE YOUR ACCOUNT – CLICK-ON "X"
8) ADMIN WILL RECEIVE EMAIL TO APPROVE YOUR ACCOUNT
9) UPON APPROVAL, YOU WILL RECEIVE AN EMAIL
10) YOU NOW HAVE ACCESS TO LOG-IN AT ANYTIME

END OF SECTION