

**SECTION 321316.15-7**  
**LITHOCRETE LITHOMOSAIC® (LITHOMOSAIC®) SPECIFICATION**  
**SYSTEM 7**

**PART 1 GENERAL**

1.1 GENERAL CONDITIONS

- A. Requirements of "General Conditions of the Contract" and of Division 1, "General Requirements," apply to work in this Section with same force and effect as though repeated in full herein.

1.2 SCOPE OF WORK

- A. Furnish materials, labor, transportation, services, and equipment necessary to furnish and install LithoMosaic® architectural concrete paving incorporating the patented LithoMosaic® process as indicated on Drawings and as specified herein.
- B. Work included in this Section:
1. Installation of architectural concrete paving called LithoMosaic® under U.S. Patents #7,493,732 B2 and multiple U.S. Pending Patents, and U.S. Trademarks #1,879,329, #2,358,183, #3,416,208 and #3,555,406.
  2. Only experienced Architectural Cast-in-place Concrete installers, certified to install Lithocrete® are acceptable for this project. Acceptance of certification will be based on proof of certification, experience and approved samples and mockups to be provided within 30 days after Notice to proceed. If timeframe is exceeded, suitable experience is not provided, or mockups are unacceptable – installer will not be eligible to install project.
  3. Contact:  
**PROGRESSIVE HARDCAPES** – *Mike Riggs* – (623) 582-2274  
[Mike@ProgressiveHardscapes.com](mailto:Mike@ProgressiveHardscapes.com)
- C. Work related in other Sections:
1. Section 02750 - Portland Cement Concrete Paving: Adjacent concrete paving.
  2. Section 02810 - Irrigation System: Coordination of irrigation sleeve installation.
  3. Section 02900 - Landscape Planting: Coordination of plant material placement.
  4. Section 07900 – Joint Sealers: Installation of caulking.

1.3 REQUIREMENTS OF REGULATORY AGENCIES

- A. Federal, State and local laws and regulations governing this Work are hereby incorporated into and made part of this Section. When this Section calls for certain materials, workmanship, or a level of construction that exceeds the level of Federal, State, or local requirements, provisions of this Section take precedence.
- B. No procedures, materials or products referenced in this specification may be substituted or replaced with a proposed alternative or equivalent product without the written consent of Lithocrete, Inc.

1.4 APPLICABLE STANDARDS

- A. Specifications and recommended practices of American Concrete Institute (ACI), American Society for Testing and Materials (ASTM), The Uniform Building Code, and U.S. Patents #7,493,732 B2 and multiple U.S. Pending Patents, and U.S. Trademarks #1,879,329, #2,358,183, #3,416,208 and #3,555,406 referred to in this Specification with their individual designations are to be considered part of this Specification.

B. Design and Control of Concrete Mixtures – Thirteenth Edition; Portland cement Association.

#### 1.5 QUALITY CONTROL

- A. Quality control to be maintained by licensed installers of LithoMosaic® throughout duration of project.
- B. Paving Subcontractor Qualifications: provide evidence to indicate successful experience in providing LithoMosaic® similar to that specified herein and demonstrate successful experience
- C. As part of the bid submittal the General Contractor shall submit background information and/or qualifications on his Architectural Cast-in-place Contractor certified for LithoMosaic® installation. This information shall provide evidence to indicate successful experience in providing concrete work identical to that specified herein. A listing of projects shall be provided and shall be reviewed and approved as comparable projects to the specified work by the Owner or Architect prior to award of bid. Failure to provide this information or the submittal of incomplete or inaccurate information shall give cause to reject the entire bid as non responsive and incomplete. The submittal shall provide the Owner and Architect with evidence of successful experience in LithoMosaic® similar to that specified herein and can demonstrate successful experience through past project documentation and references.
- D. Demonstration of experience: provide a list of installed LithoMosaic® architectural cast-in-place concrete projects with a reference list of each containing address of installation, contact person and phone number of project's architect or owner's representation. Minimum size of each individual installation shall be 350 square feet. Provide two (2) color photos, 8" x 10" size, of each installation listed above representing the installation. Photo #1 shall show the approximate size of the installation. Photo #2 shall be taken approximately 2 to 3 feet from the paving service. See submittals portion of this section for additional information.
- E. Supervision: On site superintendent must have a minimum of 10 years experience installing Lithocrete®.
- F. Lithocrete products and systems affect adjacent finishes and construction. Therefore, Lithocrete items should be included and priced as part of an entire, larger "Lithocrete" area and sales price.

#### 1.6 SITE INSPECTION

- A. Verify conditions at site that affect work of this Section.
- B. Take field measurements as required.
- C. Report major discrepancies between drawings and field dimensions to Owner's Authorized Representative prior to commencing work.

#### 1.7 SUBMITTALS

- A. Product Data: Submit no later than 10 days after contract award a typed list of products specified in this Section.
- B. Shop Drawings:
  - 1. Submit shop drawings for reinforcing steel and accessories in accordance with ACI standards.
  - 2. Paving Jointing and Pour Sequence Plan
    - a. Proposed layout of contraction, construction and isolation joints. Clearly delineate the three different joint types.
    - b. Layout of paving types as indicated on Drawing Paving Schedule. Give overall dimensions of each paving type.
    - c. Concrete pour sequence. Indicated sequence of paving pour installation.

- C. Statement of Mix Design: Submit (1) copy of Statement of Mix Design prepared by batch plant servicing Project for each load delivered to Project. Statement of Mix Design to contain following information:
  - 1. Name, address, and telephone number of batch plant preparing statement of mix design.
  - 2. Date of mix design.
  - 3. Project location.
  - 4. Contractor requesting load delivery.
  - 5. Mix design number.
  - 6. Integral color used.
  - 7. Gradations for sand and aggregate.
  - 8. Material weights, specific gravity, and absolute volumes.
  - 9. Basis of testing, i.e. UBC 2605 D4 and Title 24 2604 D4.
  - 10. Water/cement ratio.
  - 11. PSI rating.
- D. Submit evidence of licensed installer qualifications for experience, demonstration of square footage installed, number of projects, and contact information to verify experience as indicated in Quality Control section of this specification.

#### 1.8 SUBSTITUTIONS

- A. None allowed unless approved in writing by Owner's Authorized Representative.
- B. If a substitution is used but does not equal mock-up and Lithocrete quality and specifications, an assessment can be made by Lithocrete, Architect and Owner's Representative and a 15% reduction in contract will be issued in a final change order to the subcontractor on the Lithocrete scope of work.

#### 1.9 TESTING

- A. A testing agency may be designated by Owner or Owner's Authorized Representative. Testing personnel to meet ASTM E329 requirements.

#### 1.10 MOCK-UPS

- A. Prior to construction, provide (1) 4-foot x 4-foot x 4-inch sample of each LithoMosaic® paving type specified on Drawings.
- B. Ensure that each mock-up contains joint types specified on project, i.e. construction, contraction, and isolation.
- C. Locate mock-ups in a conveniently accessible and protected place. Approved mock-ups will be standard for future Lithocrete® installation review.
- D. Remove mock-ups from site upon completion of Work and approval by Owner's Authorized Representative.

#### 1.11 PROJECT CONDITIONS

- A. Keep work area clean, and in a safe and workman-like condition so that rubbish, waste and debris do not interfere with work of other trades.

#### 1.12 PRODUCT HANDLING

- A. Store materials in a dry and protected location. Protect reinforcing steel and dowels from rusting, deformation, staining, and moisture damage.

- B. Keep Lithocrete® aggregate dry at all times prior to installation.

#### 1.13 COORDINATION

- A. Notify Owner's Authorized Representative and contractors performing work related to installation of Contractor's Work in ample time, so as to allow sufficient time for them to perform their portion of work.

### **PART 2 PRODUCTS**

#### 2.1 PORTLAND CEMENT

- A. Type I, IA, II, IIA, III, IIIA, IV, and V cements, to conform to ASTM C150.
- B. Use same brand of cement from single source throughout entire project.
- C. Refer to Drawings for cement type specified.

#### 2.2 WASHED CONCRETE SAND

- A. Clean, hard, and durable washed concrete sand, conforming to ASTM C33.
- B. Use same sand from single source throughout entire project.

#### 2.3 COARSE AGGREGATE

- A. Clean, hard, and durable coarse aggregate, conforming to ASTM C33.
- B. Use same aggregate from single source throughout entire project.

#### 2.4 WATER

- A. Free from deleterious materials such as oils, acids, and organic matter.

#### 2.6 ADMIXTURES

- A. Integral Concrete Coloring Admixture: Refer to Drawings for color type and manufacturer.
  - 1. Acceptable Manufacturers:
    - a. L.M. Scofield; (800) 800-9900
    - b. Colorfull by Admixtures, Inc.; (626) 357-3263
    - c. QC; (800) 453-8213
    - d. Davis Colors; (323) 269-7311
    - e. Solomon Colors; (800) 624-0261
    - f. BASF; (909) 987-1758
- B. Air Entrainment Admixtures: Conforming to ASTM C260.
  - 1. Acceptable Manufacturers:
    - a. Grace Construction Products; Daravair®, (800) 433-0020 or [www.graceconstruction.com/concrete/air\\_entraining.html#daravair](http://www.graceconstruction.com/concrete/air_entraining.html#daravair).
    - b. Master Builders, Inc.; Micro-Air®, (800) 628-9990 or [www.masterbuilders.com/MB/pub/Product.asp?TypeCat=2&ParentID=78&ProductID=22](http://www.masterbuilders.com/MB/pub/Product.asp?TypeCat=2&ParentID=78&ProductID=22).
    - c. Sika®; AEA-15, (201) 933-8800 or [usa.sika.com/dms/...get/.../pds-cpd-Sika%20AEA-15-us.pdf](http://usa.sika.com/dms/...get/.../pds-cpd-Sika%20AEA-15-us.pdf)

- C. Water Reducing Admixtures: Conforming to ASTM C494, Type A.
  - 1. Acceptable Manufacturers:
    - a. Grace Construction Products; WRDA® (800) 433-0020  
[www.graceconstruction.com/concrete/water\\_reducers.html#wrda](http://www.graceconstruction.com/concrete/water_reducers.html#wrda).
    - b. Sika®; Viscocrete 2100, (201) 933-8800, usa.[sika.com/.../pds-cpd-Sika%20ViscoCrete%202100-us.pdf](http://sika.com/.../pds-cpd-Sika%20ViscoCrete%202100-us.pdf)

D. ASR Mitigating Admixture

- 1. Acceptable Manufacturers:
  - a. Grace Construction Products; RASIR (800) 433-0020 or  
<https://grace.com/construction/en-us/Documents/Rasir-01C.pdf>
  - b. Euclid; Eucon Integral Arc, (216) 531-9222 or  
[http://euclidchemical.com/fileshare/ProductFiles/techdata/eucon\\_integral\\_arc.pdf](http://euclidchemical.com/fileshare/ProductFiles/techdata/eucon_integral_arc.pdf)
  - c. Sika®; Control ASR, (201) 933-8800, usa.[sika.com/dms/.../pds-cpd-Sika%20Control%20ASR-us.pdf](http://sika.com/dms/.../pds-cpd-Sika%20Control%20ASR-us.pdf)

2.7 READY MIXED CONCRETE

- A. Batched, mixed and transported in accordance with ASTM C94 - "Specifications for Ready Mixed Concrete."

2.8 REINFORCING

- A. Reinforcing Steel: Conforming to ASTM A615, clean and free of rust, dirt, grease or oils.
- B. Tie Wire: 16-gauge plain cold-drawn steel conforming to ASTM A82, clean and free of rust, dirt, grease or oils.
- C. Supports for Reinforcement:
  - 1. Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars in place.
- D. Polypropylene Fiber Reinforcement: 100% virgin multifilament polypropylene fibers, complying with ASTM C 1116 - Type III.
  - 1. Acceptable Manufacturers:
    - a. Fibermesh; Fibermix Stealth® – 1/4" long (423)892-8080 or  
[www.fibermesh.com/family/stealth.htm](http://www.fibermesh.com/family/stealth.htm).
    - b. Grace Construction Products; MicroFiber™ (800)433-0020 or  
[www.graceconstruction.com/concrete/fibers.html](http://www.graceconstruction.com/concrete/fibers.html)
  - 2. Application Rate: 1/2 lb. /cy of mix.

2.9 ISOLATION JOINT MATERIALS

- A. Refer to Section 07900 – Joint Sealers for isolation joint construction.

2.10 CONSTRUCTION JOINT DOWELS

- A. Construct Speed Dowel or Diamond Dowel Construction Joints (CJ) at modules no larger than 15'-0" x 15'-0".
- B. Dowel schedule to match rebar schedule at a minimum spacing of 24" o.c.
- C. 1/2-inch-diameter smooth dowel free of dirt, grease, and oils. Encase 50 percent of each dowel in a Speed Dowel™ plastic sleeve to allow parallel lateral movement of each Dowel. Double check steel dowel to Speed dowel tolerance to insure snug fit. Contact Greenstreak at (800) 325-9504 or [www.greenstreak.com/speeddowellhome.htm](http://www.greenstreak.com/speeddowellhome.htm). Or contact local suppliers such as White Cap.

2.11 FLY ASH

- A. ASTM C618 - Type F.

2.12 LITHOCRETE PRODUCTS

- A. Lithocrete Conditioner
  - 1. Acceptable Manufacturers
    - a. Lithocrete; Lithocrete Conditioner
- B. LithoMosaic Etch-Retarder
  - 1. Acceptable Manufacturers
    - b. Lithocrete; Lithocrete Etch Retarder
- B. Lithoseal
  - 1. Acceptable Manufacturers
    - a. Lithocrete

**PART 3 EXECUTION**

3.1 SUBGRADE

- A. Subgrade to meet requirements of project's soils report.
- B. Recommend that a minimum 4-inch layer of aggregate base course (ABC) compacted to 95 percent relative compaction placed over subgrade prior to placing concrete.
- C. Screed to a smooth plane.
- D. Ensure that utilities, including irrigation lines are buried and compacted below bottom of aggregate base course layer.
- E. Keep aggregate base course damp prior to placing concrete.

3.2 FORMING

- B. Be responsible for design and engineering of formwork as well as its construction.
- B. Ensure that Work conforms to recommended practice for concrete formwork (ACI 347), latest edition.
- C. Do not exceed 18-feet by 18-feet in a formed construction area.
- D. Allow forms to remain in place long enough to allow concrete to set properly. Remove forms when appropriate.

3.3 DESIGN OF MIXES AND PROPORTIONING

- A. Proportion and mix of cement, aggregate, admixture and water to attain required plasticity and strength in accordance with current edition of ACI Manual of Concrete Practice and PCA "Design and Control of Concrete Mixtures."
- B. Concrete mixtures to be designed by an approved commercial testing laboratory, using approved materials to obtain specified minimum compressive strength.

- C. Concrete Mix Criteria:
1. Slump: 5-inch, with a 1/2-inch slump differential between successive batches. Obtain approval from Owner's Authorized Representative if slump is outside these parameters.
  2. Minimum PSI rating at 28 days: 3,000 and 4,000 PSI in areas with freeze thaw.
  3. Fly ash: Use for seeding reactive Lithocrete® aggregates such as glass and seashells. May be eliminated when ASR mitigating admixtures are used.
  4. Non-Chloride Accelerators: Do not use corrosive accelerators such as calcium chloride.
  5. Concrete Delivery: Use of concrete loads exceeding 90 minutes from time of batch plant must be approved by Owner's Authorized Representative.
  6. Ensure that batch plant guarantees single source supply for cement, sand, and aggregate for the entire project.

### 3.4 LITHOMOSAIC INSTALLATION

- A. LithoMosaic® is a patented paving process. Installation of LithoMosaic® must be performed by a licensed LithoMosaic® installer only.
- B. Contact Lithocrete® at (949) 642-0660 for a licensed LithoMosaic® installer in project area.  
Arizona - PROGRESSIVE HARDSCAPES – *Mike Riggs* – (623) 582-2274  
[Mike@ProgressiveHardscapes.com](mailto:Mike@ProgressiveHardscapes.com)  
Colorado & Utah -COLORDO HARDSCAPES – *Karen Keyes* (720)-248-4355  
[Karen@coloradohardscapes.com](mailto:Karen@coloradohardscapes.com)
- C. LithoMosaic® is installed in accordance under U.S. Patents #6,033,146, #6,016,635, #7,493,732, Pending 12/251,336, and U.S. Trademarks #1,879,329, #2,358,183, #2,358,054, #3,416,208 and #3,555,406.
- D. LithoMosaic finish matching Certified Lithocrete Installer's Sample #XX-XXX.
- E. LithoMosaic® process incorporates use of following patented products:
1. Lithocrete® Conditioner
  2. LithoMosaic Etch-Retarder
  3. Lithoseal paving sealer

### 3.5 JOINTING

- A. Refer to ACI 302 "Guide for Concrete Floor and Slab Construction" for work under this section.
- B. Construction and Contraction Joints:
1. Saw-cut construction and contraction joints in locations indicated on Drawings.
  2. Perform jointing with a new diamond tip circular saw.
  3. Joint Width: Per Drawings. Do not exceed 3/16-inch in width.
  4. Depth of sawcuts: 1/4th depth of slab.
  5. Decorative Saw-cut Joints: Per Drawing.
  6. Saw-cut joints in a straight line with no over-cutting.
  7. Use a hand tool to saw-cut up to vertical edges such as walls, steps, curbs and columns. No cutting into vertical surfaces will be allowed.
- C. Isolation Joint Caulking:
1. Install isolation joint caulking to be installed under Section 07900 – Joint Sealers.

### 3.6 CURING

- A. After LithoMosaic® exposure, cure concrete for seven (7) days without foot traffic and thirty (30) days without vehicular traffic. If a curing compound is required, refer to Section 2.12 of this specification for acceptable curing compounds for use with Lithocrete.

### 3.7 SEALING

- A. Lithoseal paving sealer (Sealer not required if ASR mitigating admixture is used)
- B. Follow Lithoseal sealer directions when applying this product.

### 3.8 MAINTENANCE

- A. Follow Lithocrete Paving Cleaning and sealing care procedures.
- B. Surfaces exposed to salts, chlorine, and chemicals should be washed daily with potable water.
- C. Pressure wash at the first sign of calcification or salt build up and reseal with Lithoseal and a water proofing sealer.

END OF SECTION



**(Name of Project)**

**REQUIRED ARCHITECTURAL CAST-IN-PLACE CONCRETE  
SUB-CONSULTANT INFORMATION**

The proper installation of specialty concrete finishes such as LithoMosaic is critical to the success of the project. The bidder or the bidder's subcontractor shall have one or more LithoMosaic® projects installed. Minimum size of individual installations shall be 300 square feet.

**I. LICENSED LITHOCRETE INSTALLER**

- Contractor: \_\_\_\_\_
- Project Manager/Foreman: \_\_\_\_\_
- Phone Number: \_\_\_\_\_

**II. COMPARABLE PROJECT LIST**

1. Project Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Name of Contact: \_\_\_\_\_  
Phone Number: \_\_\_\_\_
  
2. Project Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Name of Contact: \_\_\_\_\_  
Phone Number: \_\_\_\_\_
  
3. Project Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Name of Contact: \_\_\_\_\_  
Phone Number: \_\_\_\_\_

Provide two (2) color photos, 8"x10" in size, of each installation listed above. Photo #1 shall show the approximate size of the installation. Photo #2 shall be taken approximately 2 to 3 feet from the respective paving surface. Photos shall clearly show the detail associated with the Lithocrete® finish or the photo(s) will be rejected. The bidder must submit the above information along with the color photos with the bid. Failure to submit the information and photos shall be considered a non-responsive bid and therefore the bidder shall be considered non-responsive. The bidder furthermore shall review the specialty concrete samples on file with the Owner. The signature below acknowledges that the bidder has reviewed the Owner's samples.

\_\_\_\_\_  
Signature of Bidder

\_\_\_\_\_  
Date