

SECTION 321316.23 - STAMPED CONCRETE PAVING

This Section specifies stamped concrete paving incorporating L. M. Scofield's LITHOTEX Pavecrafters imprinting patterns and LITHOCHROME Color Hardener. Suitable for a variety of applications, from commercial interiors to warehouse and industrial floors.

Refer to www.scofield.com for current Scofield Tech-Data Bulletins describing materials and installation requirements. Customer service number is (800) 800-9900.

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Dry-shake colored hardener applied to exterior concrete paving surfaces as indicated on Drawings.
2. Stamping concrete patterns with special imprinting tools.
3. Curing of colored and imprinted concrete.

B. Related Sections:

Edit to suit Project requirements.

1. Section 033000 "Cast-In-Place Concrete" for general concrete applications.
2. Section 079200 "Joint Sealants" for colored sealant installed in paving joints.
3. Section 321313 "Concrete Paving" for basic concrete paving requirements.

1.2 REFERENCES

A. American Concrete Institute (ACI):

1. ACI 301: Specification for Structural Concrete for Buildings.
2. ACI 302.1R: Recommended Practice for Concrete Floor and Slab Construction.
3. ACI 303.1: Standard Specification for Cast-in-Place Architectural Concrete.
4. ACI 304: Recommended Practice for Measuring, Mixing, Transporting and Placing of Concrete.
5. ACI 305R: Recommended Practice for Hot Weather Concreting.
6. ACI 306R: Recommended Practice for Cold Weather Concreting.

B. ASTM International (ASTM):

1. ASTM C 260: Standard Specification for Air Entraining Admixtures for Concrete.
2. ASTM C 309: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
3. ASTM C 979: Standard Specification for Pigments for Integrally Colored Concrete.

- C. Portland Cement Association (PCA):
 - 1. PA124: Finishing Concrete with Color and Texture.

1.3 SUBMITTALS

- A. Product Data: For the following products:

Edit to suit Project requirements.

- 1. Dry-shake colored hardener.
- 2. Antiquing release agent.
- 3. Liquid release agent.
- 4. Imprinting/Texturing tools.
- 5. Curing compound and sealer.

- B. Design Mixes: For each type of concrete.
- C. Samples for Initial Selection: Manufacturer's color charts showing full range of colors available.
- D. Qualification Data: For manufacturer and Installer.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 10 years of documented experience producing the specified products.
- B. Installer Qualifications: Minimum 5 years of documented experience with work of similar scope and complexity required by this Project and acceptable to, or certified by, stamped concrete paving manufacturer.
- C. Publications: Comply with applicable requirements of ACI 301 and PCA PA124.
- D. Material Source: Obtain each specified material from the same source.
- E. Notification: Give a minimum 7 calendar days' notice to manufacturer's authorized field representative before date established for commencement of work.

For large projects or where color and appearance are critical, include provisions for a mockup to demonstrate finished appearance and workmanship standards.

- F. Stamped Concrete Paving Mockups:
 - 1. Construct a 10 foot by 10 foot mockup at location selected by Architect.
 - 2. Provide individual mockups for each color and pattern required.
 - 3. Construct mockup using materials, processes, and techniques required for the work, including curing procedures. Incorporate representative control, construction, and expansion joints according to Project requirements. Installer for the work to construct mockup.

4. Notify Architect and Owner a minimum of seven calendar days in advance of the date scheduled for each mockup construction.
5. Obtain the Architect's and Owner's acceptance of each mockup prior to commencement of the work.
6. Each mockup to remain until completion of the work to serve as a quality control standard for the work. Provide suitable protections to preclude damage to mockup.
7. Demolish and remove each mockup from site when directed.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in original factory unopened, undamaged packaging bearing identification of product, manufacturer, batch number, and expiration date as applicable.
- B. Store products in a location protected from damage, construction activity, and adverse environmental conditions according to manufacturer's current recommendations.
 1. Imprinting tools must be stored flat, textured face up, with no objects resting on top.
- C. Handle products according to manufacturer's printed instructions.

1.6 PROJECT CONDITIONS

- A. Schedule placement to minimize exposure to wind and hot sun before curing materials are applied.
- B. Do not place concrete if rain, frost, or snow is forecast within 24 hours of placement. Protect fresh concrete from moisture and freezing conditions.
- C. Compliance Standards: ACI 305R and ACI 306R.

1.7 PREINSTALLATION CONFERENCE

- A. Seven calendar days prior to scheduled date of concrete placement, conduct a meeting at Project site to discuss requirements, including application methods. Attendees to include Architect, Owner, Contractor, Installer, concrete supplier, and manufacturer's authorized field representative.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Provide products specified herein manufactured by L. M. Scofield Company (Scofield).

2.2 MATERIALS

- A. Dry-Shake Colored Hardener: Cementitious material containing special hard aggregates, formulated as a high opacity color hardening material for the top surface of freshly place concrete substrates. Highly UV-resistant. Factory proportioned, mixed and packaged, ready-to-use. Comply with ASTM C 979.

- 1. Product: Scofield's "LITHOCHROME Color Hardener."
- 2. Colors: _____.
- 3. Imprinting Tools: System of matched tools for imparting textures and patterns into freshly placed concrete surfaces.
- 4. Product: Scofield's "LITHOTEX Pavecrafters."
- 5. Patterns: _____.

- B. Antiquing Release Agent: Colored, finely powdered material formulated to break the bond between imprinting tools and surface of color-hardened concrete while imparting an antiqued appearance.

- 1. Product: Scofield's "LITHOCHROME Antiquing Release."
- 2. Colors: _____.

If antiquing is not a requirement, delete paragraph above and select one of the following two paragraphs.

- C. Low VOC Liquid Release Agent: Colorless, odorless liquid formulated to break the bond between imprinting tools and surface of color-hardened concrete. Evaporates completely, leaving no residue. VOC content less than 450 g/L (3.75lb/gal).

- 1. Product: Scofield's "LITHOTEX Liquid Release."

- D. Liquid Release Agent: Colorless, scented liquid formulated to break the bond between imprinting tools and surface of color-hardened concrete. Evaporates completely, leaving no residue.

- 1. Product: Scofield's "LITHOTEX Liquid Release."

Select curing and sealing compound from available choices in following two paragraphs, and to suit Project requirements.

- E. Waterborne Curing Compound and Sealer: Low VOC waterborne modified acrylic formulation. Complies with ASTM C 309.

- 1. Product: Scofield's "SCOFIELD Cureseal-W."

- F. Solvent-Borne Curing Compound and Sealer: 100 percent methacrylate polymers and UV inhibitors blend. Low VOC waterborne modified acrylic formulation. Complies with ASTM C 309.

Select one of the following products.

- 1. Product: Scofield's "SCOFIELD Cureseal-S."
- 2. Product: Scofield's "SCOFIELD Cureseal-VOC."
- 3. Product: Scofield's "SCOFIELD Cureseal-100."

2.3 CONCRETE MIX DESIGN

Note: If the entire concrete paving work for Project is covered under this Section, it must be revised to include basic requirements in Part 2 and Part 3 that are contained in the referenced Section below.

- A. General: Refer to Section 321313 "Concrete Paving" for basic concrete paving requirements, including formwork, reinforcement, concrete materials, and mixing.
- B. Minimum Cement Content: 5-1/2 sacks per cubic yard of concrete.
- C. Mix design must not permit segregation of concrete materials during pumping, placing, or consolidation of concrete. Slump not to exceed 4 inches.
- D. Admixtures:
 - 1. A normal or retarded-set, water-reducing admixture is permissible.
 - 2. An air-entraining admixture complying with ASTM C 260 is acceptable where freeze/thaw durability is required.
 - 3. A nonchloride accelerator is acceptable for cold weather concrete placement.
 - 4. Do not add a high-range water reducing admixture (superplasticizer).
- E. Do not add calcium chloride to concrete mix.
- F. Use of fly ash as a cement replacement may be acceptable, subject to manufacturer's current recommendations.
- G. Do not add water to the mix in the field.

PART 3 - EXECUTION

3.1 SUBGRADE PREPARATION

- A. Subgrade to receive stamped concrete paving work must be well drained and have adequate, uniform loadbearing characteristics.
 - 1. Verify grading will ensure a uniform concrete thickness during concrete placement.

- B. At the time of concrete placement, subgrade must be moist, completely consolidated, and free from frost. If necessary, subgrade may be dampened with water prior to placement; however, freestanding water or soft, muddy, or frozen ground is not permissible.

3.2 CONCRETE PLACEMENT

- A. General: Place and spread concrete to completely fill all space inside forms. Move concrete into place with square-tipped shovels or concrete rakes.
- B. Consolidate concrete by tamping or vibrating to provide a suitable surface for finishing.
- C. Prior to appearance of excess moisture or bleed water, screed concrete with wood or magnesium straight edge or mechanical vibrating screed.
- D. Continue concrete surface leveling and consolidation with highway magnesium straight edge and (or) magnesium bull float.
- E. Mechanically float concrete surfaces to required flatness and levelness as soon as concrete surface has taken its initial set and will support weight of a power float machine equipped with float shoes or combination blades and operator.
 - 1. Comply with ACI 302.1R for acceptable tolerances.
- F. Completed concrete placement to result in an open surface suitable to receive colored hardener.

3.3 STAMPED CONCRETE PAVING INSTALLATION

- A. Apply 2/3 of dry-shake colored hardener at specified application rate to freshly floated concrete surface. Bleed water must not be present during or following application of first and second dry-shake applications.
- B. Do not throw dry-shake colored hardener material; distribute evenly by hand or mechanical spreader designed to apply floor hardeners. Mechanical spreader manufacturer as acceptable to stamped concrete paving manufacturer.
- C. As soon as dry-shake material has absorbed moisture, indicated by uniform darkening of surface, mechanically float concrete surface a second time, just enough to bring moisture from base slab through dry-shake color hardener.
- D. Immediately following second floating, apply remaining 1/3 of dry-shake colored hardener at specified application rate. If applied by hand, broadcast in opposite direction of first application for a more uniform coverage. If a mechanical spreader is used, apply in same manner as previously described.
- E. As soon as dry-shake material has absorbed moisture, mechanically float concrete surface a third time.
- F. Do not add water to the surface.

- G. Begin imprinting operations immediately after applying dry-shake colored hardener, according to manufacturer's written instructions, including application of powder antiquing release agent.

3.4 SEALING

- A. Prior to sealing, the following conditions must be present:
 - 1. Release agent has been removed.
 - 2. Moisture content of concrete is low enough that alkali and other salts do not become trapped beneath sealer. This will require a minimum of 28 days subsequent to concrete placement, or longer if required.
 - 3. No evidence of free water on concrete surfaces to receive curing and sealing compound.
- B. Seal imprinted concrete with liquid membrane curing and sealing compounds as recommended by manufacturer.
- C. Apply two coats of specified curing and sealing compound according to manufacturer's written instructions.

3.5 PROTECTION OF FINISHED WORK

- A. Prohibit foot or vehicular traffic on the newly imprinted concrete surface.
- B. Protect floor surface from damage throughout remainder of construction period until Final Acceptance of the work. If a covering material is necessary, surfaces must remain uncovered for a minimum of four days after which they may be covered with a new, smooth, nonstaining reinforced kraft curing paper. Plastic sheeting is unacceptable as a covering material.

3.6 SCHEDULE

- A. Refer to Drawings for locations of stamped concrete paving applications.

END OF SECTION 321316.23

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