



**SPECIAL PROVISIONS
FOR
CRITICAL INTEGRALLY COLORED CONCRETE OVERLAY**

**Scott County
IM-NHS-074-1(198)5--03-82**

**Effective Date
April 25, 2017**

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

150204.01 GENERAL.

A. Description.

This work includes the placing and finishing of integrally colored concrete pavement in segments with release agent, stamped pattern finishing, and concrete curing and sealing agents. The work shall include all labor, materials, equipment, and transportation required to install colored and tooled PCC pavement.

B. References.

1. American Concrete Institute (ACI).

- a. ACI 301 "Specification for Structural Concrete for Buildings".
- b. ACI 302 IR "Recommended Practice for Concrete Floor and Slab Construction".
- c. ACI 303.1 "Standard Specification for Cast-In-Place Architectural Concrete".
- d. ACI 304 "Recommended Practice for Measuring, Mixing, Transporting and Placing of Concrete".
- e. ACI 305R "Recommended Practice for Hot Weather Concreting".
- f. ACI 306R "Recommended Practice for Cold Weather Concreting".

2. American Society of Testing and Materials (ASTM).

- a. ASTM C309 "Standard Specifications for Liquid Membrane-Forming Compounds for Curing Concrete".
- b. ASTM C494 "Standard Specification for Chemical Admixtures for Concrete".
- c. ASTM C979 "Standard Specification for Pigments for Integrally Colored Concrete".

3. American Association of State Highway and Transportation Officials (AASHTO).

- a. AASHTO M194 "Chemical Admixtures".

4. Section 2413 of the Standard Specifications, except as amended in these Special Provisions and except for finishing methods which shall be submitted to the Engineer for review and

approval as part of the mockup prior to production work.

5. National Ready Mixed Concrete Association (NRMCA).
CIP 5 "Plastic Shrinkage Cracking".

C. Submittals.

1. Product Data: Submit manufacturer's complete technical data sheets for the following:
 - a. Integral color concrete mixture.
 - b. Liquid release agent.
 - c. Imprinting/Texturing tools.
 - d. Curing and sealing compound for integral colored concrete.
2. Design Mixes: For each type of concrete.
3. Samples for Initial Selection: Manufacturer's color charts showing proposed selection that complies with specified color match.
4. Qualification Data: For firms indicated in Quality Assurance Article, including list of completed projects.

D. Quality Assurance.

1. Manufacturer's Qualifications: Manufacturer with 10 years of experience in manufacture of specified products:
2. Installer Qualifications: An installer with 10 years of experience with work of similar scope and complexity. Contractor shall certify that all personnel involved in directing and performing work critical to the end result also meet the experience requirement. A representative of the manufacturer shall be present during construction of mockup and at the commencement of production work.
3. Comply with the requirements of ACI 301.
4. Obtain each specified material from same source and maintain high degree of consistency in workmanship throughout project.
5. Notification of manufacturer's authorized representative shall be given at least 1 week before start of Work.
6. **Colored Concrete Mockups.**
 - a. At least 60 calendar days prior to production work and at location on Project selected by Engineer, place and finish one 10 feet by 10 feet area simulating the location indicated in the plans to demonstrate colored and stamped/imprinted concrete and joints with end color result.
 - b. Construct mockup using processes, details and techniques intended for use on permanent work, including two-stage pour with overlay and finishing and curing procedures. The mockup shall represent the full thickness of the structural first stage concrete pour including the overlook curb. Include samples of control, construction, and expansion joints in sample panels. Mockup shall be produced by the individual workers who will perform the work for the Project.
 - c. If mockup is rejected, construct another mockup at the direction of the Engineer.
 - d. Accepted mockup provides visual and slip-resistance standard for production concrete work.
 - e. Mockups shall remain through completion of the work for use as a quality standard for finished work.

- f. Upon completion of the associated work and at the direction of the engineer, the mockup(s) shall be removed from the site.

E. Delivery, Storage, and Handling.

1. Deliver products in original factory unopened, undamaged packaging bearing identification of product, manufacturer, batch number, and expiration data, as applicable.
2. Store the product in a location protected from damage, construction activity, and precipitation in strict accordance with the manufacturer's recommendations.

F. Field Conditions.

1. Verify surface of first stage concrete pour is sufficiently roughened in accordance with the contract documents. Amend if necessary by mechanical means or abrasive blasting as approved by and to the satisfaction of the Engineer.
2. **Environmental Requirements.**
 - a. The first stage, overlook deck concrete must be allowed to cure at least 72 hours prior to overlay.
 - b. Schedule placement to minimize exposure to wind and hot sun before curing materials are applied.
 - c. Avoid placing concrete if rain, snow, or if frost is forecast within 24 hours. Protect fresh concrete from moisture and freezing.
 - d. Comply with manufacturer's recommendations.
3. Comply with professional practices described in ACI 305R and ACI 306R.
4. Protect surrounding existing surfaces and new improvements with secure covering during application of subsequent pours.
5. Schedule delivery of integral colored concrete to provide consistent mix times for batching until discharge. Mix times shall meet manufacturer's written recommendations.
6. When possible, deliver in single batch all the concrete required for pour of individual color or deck segment.

G. Pre-Job Conference.

At least 7 calendar days prior to placement of overlook concrete or mockup, a meeting between Contractor, Engineer and manufacturer's representative shall be held to discuss the project and the concrete pouring and stamping procedures.

150204.02 MATERIALS.

A. Acceptable Manufacturers.

1. L.M. Scofield Company, Local contact: Central Division Office, phone (630)377-5959.
2. Brickform, division of Solomon Colors, Inc., 11061 Jersey Blvd, Rancho Cucamonga, CA, 91730, phone (800)483-9628.
3. Butterfield Color, 625 W. Illinois Ave., Aurora, IL, phone (800)282-3388.

B. Materials.

1. **Colored Admixture for Integrally Colored Concrete.**

- a. Match Federal Standard No. 595C Color numbers 35109 (blue 1), 35182 (blue 2), 35240 (blue 3), 36373 (cool gray), 37040 (Dark gray) as close as possible using gray cement. Contractor shall submit proposed color for Engineer approval prior to purchasing product. Final approval of color admixture is contingent on approval of mockup. Approved products are as follows:
 - 1) CHROMIX P[®] Admixture and CHROMIX ML[®]; L.M. Scofield Company.
 - 2) Brickform Powdered Integral Color; Brickform.
 - 3) Butterfield Color[®] Uni-Mix[®] Integral Concrete Colorant; Butterfield Color.
- b. Admixture shall be a colored, water-reducing, admixture containing no calcium chloride with coloring agents that are lime proof and UV resistant.
- c. Colored admixture shall conform to the requirements of ACI 303.1, ASTM C979, ASTM C494, and AASHTO M194.
- d. Carbon black is not allowed.

2. Imprinting Tools.

Stamp mats to be semi-rigid polyurethane with projected texture and ridged underside capable of imprinting texture and joint patterns to plastic concrete.

- a. L.M. Scofield company LITHOTEX[®] Pavecrafters[®], Fractured slate – embossing skin; L.M. Scofield company.
- b. Brickform Flexible Texture Skins Smooth Slate Texture; Brickform.
- c. Butterfield Color[®] Stamping Tools Bluestone texture, Butterfield Color.

3. Liquid Release Agent.

a. Approved products are as follows:

- 1) LITHOTEX[®] Liquid Release; L.M. Scofield Company.
 - 2) Brickform Liquid Release; Brickform.
 - 3) Butterfield Color[®] Clear Liquid Release; Butterfield Color.
- b. Release agent to be colorless liquid bond breaker that facilitates release of stamps.
- c. Liquid release agent shall be compatible with integral color additives and concrete texture mats.

4. Curing and Sealing material.

Comply with ASTM C309 and be of same manufacturer as integral color additive.

- a. SCOFIELD[®] Cureseal-W[™]; L.M. Scofield Company. Clear, Water Based, VOC compliant, Sealing Compound: ASTM C 309, non-yellowing, low-gloss finish.
- b. Brickform Gem Cure & Seal 309; Brickform. Clear, Solvent-Borne, VOC compliant, Sealing Compound: ASTM C 309, non-yellowing.
- c. **Butterfield Color.**
 - 1) Butterfield Color[®] Clear-Guard[™] Cure & Seal. Clear, Solvent-Borne, VOC compliant, Sealing Compound: ASTM C 309, non-yellowing.
 - 2) Butterfield Color[®] Flattening Paste. Manufacturer's standard product designed to reduce sealer gloss finish to matte finish.

5. Substitutions.

The use of products other than those specified will be considered providing that the Contractor requests its use in writing at least 14 days prior to bid date. This request shall be accompanied by the following:

- a. Certificate of compliance from material manufacturer stating that proposed products meet or exceed requirements of this Section.
- b. Documented proof that proposed materials have a 10 year proven record of performance confirmed by at least five local projects that the Engineer can examine.

C. Concrete Mix Design.

1. Concrete mix shall be HPC-O High Performance Concrete in accordance with Article 2413.02, D, 2, of the Standard Specifications, except that no fly ash shall be used. When ground

granulated blast furnace slag (GGBFS) is utilized as a cement replacement, use in accordance with the colorant manufacturer's recommendations.

2. Do not add calcium chloride to mix as it causes mottling and surface discoloration.
3. Supplemental admixtures shall not be used unless approved by colorant manufacturer.
4. Do not add water to the mix in the field.
5. Add colored admixture to the mix according to colorant manufacturer's written instructions in premeasured bags, not by weight or cement content.
6. The weight of color pigment shall be not more than 10% of total cement content by weight.

150204.03 CONSTRUCTION.

A. Installation.

1. Examine subgrade and sub-base for compliance. Surface to be overlaid shall be clean and dry. No pre-wetting is allowed. Notify Engineer if conditions are noncompliant.
2. To bond the overlay to existing concrete surface and vertical joints between adjacent segments, use grout in accordance with Articles 2413.02, E and 2413.03 E, 2, f of the Standard Specifications.
3. Concrete must be accurately placed and previous pours protected against staining. Accidental staining of any adjacent surface shall be immediately and thoroughly cleaned. Preferred sequence of pours shall be darker colors prior to lighter colors.
4. Move concrete into place with square-tipped shovels or concrete rakes.
5. Vibrators, when used, shall be inserted and withdrawn vertically.
6. Concrete shall be struck to specified level with wood or magnesium straight edge or mechanical vibrating screed.
7. Concrete surface shall be further leveled and consolidated with highway magnesium straight edge and/or magnesium bull float.
8. Mechanically float concrete surfaces using only methods reviewed and approved by Engineer as soon as concrete surface has taken its initial set.
9. Apply clear liquid release agent in accordance with manufacturer's recommendations.
10. Stamping/Imprinting: Apply pattern according to tool manufacturer's instructions.
 - a. Only clean stamps in good condition may be used on each segment.
 - b. While concrete is plastic, accurately align mats or stamping tools and uniformly press into concrete to produce imprint pattern, texture and depth of imprint as recommended by manufacturer.
 - c. Touch up pattern and finish edges with hand tools as necessary.
11. Minor variations in appearance of colored concrete, which are similar to natural variations in color and appearance of uncolored concrete, are acceptable. Color variations shall be kept to a minimum by batching for continuous pours when possible.
12. A light sandblast (brush blast) may be needed to improve the slip resistance of the concrete or

to eliminate unacceptable color variations. This shall be determined by the Engineer and if required shall be demonstrated on the mockup prior to applying on the project.

13. Each segment of colored concrete must be allowed to cure for a minimum of 25 hours before any adjacent segment(s) is/are poured.

B. Curing.

1. Protect concrete from prematurely drying and from excessive cold or hot temperatures that would alter normal curing process in accordance with the manufacturer's recommendations.
2. Curing Sealer Application: Uniformly apply sealer in continuous operation by sprayer or short nap roller according to sealer manufacturer's instructions. After initial application is dry and tack free, apply a second coat.
 - a. Do not over apply or apply in a single heavy coat.
 - b. Thoroughly mix flattening paste in sealer according to manufacturer's instructions. Stir occasionally to maintain uniform distribution of paste.
 - c. Apply curing and sealing compound at consistent time for each pour to maintain close color consistency. Time application(s) in accordance with manufacturer's recommendations.
 - d. There shall be no free water on surface at time of application
3. Take precautions in hot weather to prevent plastic cracking resulting from excessively rapid drying at surface as described in NRMCA CIP 5.
4. Do not cover concrete with plastic sheeting.

C. Sealing.

1. Follow manufacturer's recommendations for environmental conditions, surface readiness, and minimum cure time prior to sealing.
2. Preparation: Wipe areas of the finished surface with a clean, dry cloth.
3. Sealer Application: Uniformly apply sealer in continuous operation working in one direction by sprayer or short nap roller according to sealer manufacturer's instructions. After initial application is dry and tack free, apply a second coat working perpendicular to the first coat.
 - a. Do not over apply or apply in a single heavy coat.
 - b. Thoroughly mix flattening paste in sealer according to manufacturer's instructions. Stir occasionally to maintain uniform distribution of paste.

D. Protection of Finished Work.

1. Prohibit foot or vehicular traffic on paving surface for the time specified by manufacturer, or until paving is properly protected from damage.
2. Barricade area to protect paving. Do not store equipment or materials on finished surface.
3. Protect paving surface from damage until final inspection and acceptance by Engineer.
4. Repair any damage to sealed concrete in accordance with manufacturer's instructions and to the satisfaction of the Engineer.

150204.04 METHOD OF MEASUREMENT.

The quantity of acceptable 1.5 inch thick, colored, stamped and sealed PCC pavement constructed will be computed in square yards by the Engineer from measurements of the finished surface.

150204.04 BASIS OF PAYMENT.

For the area of acceptable 1.5 inch thick, colored, stamped and sealed PCC pavement, the Contractor will be paid the contract unit price per square yard for Critical Integrally Colored Concrete Overlay. This payment shall be full compensation for all materials, equipment, tools, and labor to construct the colored PCC pavement as specified in the contract documents.