

SP-096004  
(NEW)



**Iowa Department of Transportation**

SPECIAL PROVISIONS  
FOR  
ARCHITECTURALLY FINISHED PCC

Dubuque County

ESL-2160(609)--7S-31

Effective Date

November 17, 2009

THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2009, ARE AMENDED BY THE FOLLOWING MODIFICATIONS. THESE ARE SPECIAL PROVISIONS AND SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

## ARCHITECTURALLY FINISHED PORTLAND CEMENT CONCRETE

### 1. GENERAL

- 1.1. Summary: This work includes the construction of colored, stamped PCC sidewalks. The work shall include all labor, materials, equipment, and transportation required to install the colored PCC sidewalk elements. For the coloring and stamping products used all limitations and recommendations specified by the manufacturer shall be used and adhered to unless more stringent requirements are set forth herein.
- 1.2. Architecturally Finished PCC shall be in accordance with the provisions of the specification Section 251 1 except as modified below:
- 1.3. Architecturally Finished PCC shall conform to the requirements of ACI Standard Specifications for Cast-In-Place Architectural Concrete, ACI 303.1 latest addition published by the American Concrete Institute, unless more stringent requirements are set forth herein.
- 1.4. Architecturally Finished PCC shall be Class B concrete, with a compressive strength of 4000 psi at 28 days, 6%  $\pm$  1% air entrained. Concrete mix water will not be permitted to be added to the ready mix concrete at the construction site.
- 1.5. Various types of Architecturally Finished PCC flatwork shall be installed according to dimensions and colors specified in the plans.
- 1.6. Architecturally Finished PCC flatwork shall have saw cut joints and either a light broom texture or a Basketweave Used Brick (as manufactured by BrickForm Rafco Products) stamped texture as indicated in the contract documents. Maximum stamp relief shall be **1/4"**.
- 1.7. Concrete utilized for areas designated for Architecturally Finished PCC with Basketweave Used Brick texture shall be integrally colored with a dry shake color surface hardener. Brickform Rafco Products shall supply the integral color admixture in either powder or liquid form for the Architecturally Finished PCC. The color of the Architecturally Finished PCC shall be customized to match the existing colored stamped PCC sidewalk on 1st Avenue which was customized to match the most dominant brick color gradation of the Dyersville Basilica. Contractor shall submit to the Engineer color samples and mock-ups for review and approval. Architecturally Finished PCC shall not be installed until an acceptable mock-up is approved by the Engineer. The proposed integral color admixture, dry shake color surface hardener and form release antiqing shall be either approved or rejected by the Contracting Authority and Engineer based upon the finished product's ability to replicate the existing 1st Avenue colored, stamped PCC sidewalk and final antiqued finish.
- 1.8. Saw cuts shall be positioned in stamped "mortar joints" of pattern. Panels with saw cuts running through stamped "bricks" shall be removed and replaced at the expense of the contractor.

## 2. QUALITY ASSURANCE

- 2.1. At least one month prior to placing any Architecturally Finished PCC, contractor shall make for approval two (2) actual horizontal field mockup panels. Basketweave panels shall be 3' x 6'. Mockups shall be prepared using the specified or approved materials and construction techniques. A minimum of 3 cubic yards shall be mixed when the field mockups are made. Approval of the field mockup is required prior to an Architecturally Finished PCC installation. Throughout the job, periodically sample the cement and aggregate being used for comparison of color and gradation with the materials used in the test panel.
- 2.2. Color admixture shall be added in strict accordance with manufacturer's recommendations. The responsibility for batching and mixing the color admixture shall be that of the Ready Mix Supplier. Color admixture shall not be added to the ready mix concrete at the construction site. Concrete mix design products such as cement, aggregate and admixtures used in Architecturally Finished PCC shall be from the same source, type and brand used through the duration of the project. Should the Ready Mix Supplier choose to use a powder color admixture, the supplier shall empty color material contents directly into mixer or shall ensure that the biodegradable bags are thoroughly mixed and disintegrate during the batching process.
- 2.3. Once the field mockups for color, texture and finish are approved, the corresponding final concrete mix design must remain consistent through the duration of the project to ensure uniform color, texture and finish of the Architecturally Finished PCC.
- 2.4. Contractor shall apply dry shake color hardener in strict accordance with manufacturer's recommendations to all Architecturally Finished PCC surfaces.  
Provide BrickForm Raeco Products - Color Hardener.
- 2.5. Final color selection shall be approved upon review of field mockups for color, texture and finish. Should the field mockup(s) be rejected, the Contractor bears all costs associated with restocking color admixture beyond the quantities required to pour the mockups.
- 2.6. For Architecturally Finished PCC textured with a Basketweave Used Brick stamp texture as indicated in the contract documents. Brickform Texture Mats with the pattern Basketweave Used Brick, shall be provided for the Architecturally Finished PCC imprint texture mats, stamps, tools and skins.
- 2.7. The Architecturally Finished PCC texture mats, stamps, tools and skins shall have a maximum imprint relief of  $\frac{1}{4}$ ", not to exceed. The contractor shall submit the proposed texture mats and stamps for approval by the Engineer during the field mockup process using the proposed materials and techniques. The proposed texture mats and stamps shall be either approved or rejected by the Engineer based upon the product's ability to replicate the existing 1st Avenue colored, stamped PCC sidewalk and final antiqued finish.

- 2.8. All Architecturally Finished PCC flatwork control joints for the Basketweave Used Brick pattern shall be saw cut unless specifically directed otherwise by the Engineer. Control joints shall follow basketweave imprint joints.
- 2.9. All Architecturally Finished PCC flatwork expansion joints shall be constructed as indicated in the contract documents or directed by the Engineer, as expansion joints are deemed necessary. Expansion joints shall be sealed with a color matching joint sealant or material approved by the Engineer. Approval shall be based upon the product's ability to replicate the appearance of the existing 1st Avenue joint sealants in the Architecturally Finished PCC The following shall be considered approved joint sealant products:
  1. Sonneborn Building Products, ChemRex. Inc - NP2.
  2. Tremco - Dymeric 240 FC.
  3. Sika - Sikaflex - 2c NS.
  4. Approved Equal.
- 2.10. Contractor shall take all necessary precautions to protect completed adjacent concrete surfaces from damage, splatter, staining or other contaminants by subsequent construction. The Contracting Authority and Engineer reserve the right to require replacement of compromised materials and surfaces.
- 2.11. Contractor shall submit a Quality Control Plan prior to commencing construction of Architecturally Finished PCC for approval by the Engineer that shall be used to monitor the use of consistent materials, methods and construction techniques through the duration of the project to ensure uniform color, texture and finish of the Architecturally Finished PCC.
- 2.12. Contractor(s) or subcontractor(s) shall have prior experience and qualifications in the construction of Architecturally Finished PCC. Contractor(s) or subcontractor(s) shall have a minimum of two (2) years of experience with a project superintendent and personnel experienced in the specified procedures and trained in the construction of Architecturally Finished PCC. The following contractors are prequalified for the construction of Architecturally Finished PCC, other contractors need to demonstrate that they have the prior experience and qualifications required for construction of Architecturally Finished PCC prior to bid.
  1. DBD Superior Concrete, Dubuque, Iowa
  2. Manders Quality Concrete, Dubuque, Iowa
  3. Webb Concrete Construction, Independence, Iowa
  4. Designs In Concrete, Davenport, Iowa
- 2.13. Contractor shall adhere to the following construction techniques, initial cure and final sealing process for all Architecturally Finished PCC or approved equal process authorized by the Engineer.
  1. Contractor shall use consistent materials, methods and construction techniques through the duration of the project to ensure uniform color, texture and finish of the Architecturally Finished PCC.
  2. Contractor shall sufficiently saturate the subgrade prior to placement of concrete.

3. Contractor shall apply dry shake color hardener to all Architecturally Finished Concrete surfaces in accordance with manufacturer's coverage rate requirements and/or a minimum of two (2) application coverages, whichever is greater. Dry shake color hardener shall be thoroughly worked into the fresh concrete by using either a fiber or wood float. Steel trowel finishing will not be permitted on exterior air entrained concrete.
  4. Contractor shall finish the concrete surface using a magnesium float to remove any trowel marks or irregularities. Steel trowel finishing will not be permitted on exterior air entrained concrete.
  5. Prior to texturing or stamping concrete surface, Contractor shall use a tinted liquid release agent, which is compatible with the Architecturally Finished PCC, compatible with the concrete texture mats, and approved by the Engineer.
  6. Upon removal of the imprint texture mats, stamps, tools or skins, Contractor shall repair any irregularities to the textured surface.
  7. After texturing or stamping concrete surface the panel and application of the dry shake hardener, the next day the contractor shall wash the surface, after the washing is complete, contractor shall apply an initial cure seal product, which is compatible with the Architecturally Finished PCC, compatible with the final concrete sealer product and approved by the Engineer.
  8. After a minimum 28-day concrete maturity, contractor shall power wash all concrete surfaces.
  9. After concrete has been adequately cleaned, contractor shall apply a final concrete sealer product in accordance with manufacturer's application and coverage rate requirements and approved by the Engineer. The final sealer product shall have an anti-skid resistance additive product, approved by the Engineer.
- 2.14. The above materials, methods and construction techniques, initial cure and final sealing process is intended to replicate the texture, finish and color as desired by the Contracting Authority and Engineer. Should the contractor have an alternate process or method, which will replicate the texture, finish and color as desired by the Contracting Authority and Engineer, the contractor shall submit the alternate process or methods for approval by the Engineer during the job sample panel mock-up using the proposed materials and techniques.

### **3. CURING**

- 3.1. Contractor shall not begin any concrete placing operations involving colored concrete unless the atmospheric temperature is 6 degrees Celsius (43" F.) minimum and rising. At any time during the first 72 hours of the concrete curing process, should the temperature drop below 6 degrees Celsius (43" F.), Contractor shall be required to protect the concrete. Insulating blankets must be supported by a tent frame constructed to prevent the blankets from contacting the colored concrete surface. A minimum separation of one foot must be maintained between the blankets and the PCC surface. Mechanical heaters will not be permitted.
- 3.2. Architecturally Finished PCC shall be cured in strict accordance with manufacturer recommendations as approved by the Engineer. Contractor shall

apply an initial cure seal product in accordance with the manufacturer's specifications, which is compatible with the Architecturally Finished PCC, compatible with the final concrete sealer product and approved by the Engineer. Conventional wet curing (white pigmented curing compound) shall not be used on Architecturally Finished PCC. Burlap and wet coverings, plastic sheeting, or Kraft paper will not be allowed on these surfaces. Do not walk on surfaces that have been cured until they are thoroughly dry (at least 12 hours after application).

- 3.3. Architecturally Finished PCC shall be sealed in strict accordance with manufacturer recommendations as approved by the Engineer. Contractor shall apply a final sealant product in accordance with the manufacture's specifications, which is compatible with the Architecturally Finished PCC, compatible with the initial cure seal product and approved by the Engineer. The following manufacturer(s) are an approved concrete sealer supplier for the Architecturally Finished PCC.

1. Vexcon Chemicals, CertiVex AC 1315
2. Vexcon Chemicals, CertiVex AC 1315 Beading Flat
3. Equal products subject to review and approval.

- 3.4. Contractor shall incorporate with the final sealant product, an anti-skid resistance additive product, which is compatible with the final sealant product and approved by the Engineer. The following manufacturer(s) are an approved anti-skid resistance additive product for the Architecturally Finished PCC and/or approved equal:

1. Vexcon Chemicals. CertiVex Grip
2. Sherwin Williams, SharkGrip
3. Equal products subject to review and approval

#### **4. METHOD OF MEASUREMENT**

- 4.1. The quantity of Sidewalk, PCC, 6" Colored and Stamped, constructed will be computed in square yards to the nearest 0.1 SY. Deductions will not be made for fixtures having an area of 1 square yard or less.

#### **5. BASIS OF PAYMENT**

- 5.1. For the area of Sidewalk, PCC, 6" Colored and Stamped, the Contractor will be paid the contract unit price per square yard. This payment shall be full compensation for all materials, equipment, tools, and labor to construct Architecturally Finished Colored and Stamped PCC sidewalk as specified in the contract documents.