



**SPECIAL PROVISIONS
FOR
COLORED FORMLINER FINISHED STRUCTURAL CONCRETE**

**Clayton County
BHM-CHBP-2315(607)--NA-22**

**Effective Date
March 16, 2021**

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

152035.01 - GENERAL

1.1. Description

This work includes the construction of integrally colored, formlined concrete structures which have staining to mimic grout lines and which are cured and sealed. The work shall include all labor, materials, equipment, and transportation required to install the architectural treatment. For the integral color, formliner, stain, and sealer 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. References

- A.** ASTM C979 "Standard Specification for Pigments for Integrally Colored Concrete."
- B.** ASTM C309 "Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete"

1.3. Submittals

- A.** Product Data: Submit manufacturer's complete technical data sheets for the following:
 - 1. Color additives.
 - 2. Concrete stains.
 - 3. Curing products.
 - 4. Form facing materials.
- B.** Design Mixes: For each type of integrally colored concrete.
- C.** Samples for Initial Color Selection: Manufacturer's color charts showing full range of colors available.

- D. Qualification Data: Manufacturer and installer qualifications.
- E. Quality Control Plan.

1.3. Quality Assurance

- A. Manufacturer Qualifications: Manufacturer with 3 years of experience in production of specified products.
- B. Installer Qualifications: An installer with 2 years' experience with work of similar scope and equality. Provide two examples of successfully completed projects of a similar nature and complexity to the proposed project to demonstrate ability.
- C. Obtain each specified material from same source and maintain high degree of consistency in quality throughout Project.
- D. Notification of manufacturer's authorized representative shall be given at least 1 week before start of Work.
- E. Contractor shall submit a Quality Control Plan prior to commencing construction of Colored Formlined Structural Concrete 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.

1.4. Delivery, Storage and Handling

- A. All materials shall comply with manufacturer's instructions. Deliver products in original, unopened packaging. Store in dry conditions.

1.5. Project Conditions

- A. Colored Concrete Environmental Requirements:
 - 1. Schedule placement to minimize exposure to wind and hot sun.
 - 2. Avoid placing concrete if rain, snow, or frost is forecast within 24 hours. Protect fresh concrete from moisture and freezing. Contractor shall not begin any concrete placing operations involving colored concrete unless the atmospheric temperature is 43° F. minimum and rising.
- B. Schedule delivery of concrete to provide consistent mix times from batching until discharge. Mix times shall meet manufacturer's written recommendations.

152035.02 - PRODUCTS

2.1. Formliner Materials

- A. The formliner shall be reusable, high strength urethane created from real stone that attaches easily to the forming system and does not compress more than ¼ inch when poured at a rate of 10 vertical feet per hour.
- B. The formliner pattern shall be as noted in the plan details.
- C. The formliner thickness shall be as noted in the plan details.
- D. If required by the manufacturer, formliner backing shall be provided and shall be included

in the required formliner total thickness.

- E. Products: Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following:
1. Milestones, Incorporated, Hudson, WI (715) 381-9660.
 2. Scott System, Incorporated, Denver, CO (303) 373-2500.
 3. Karlson Forming Specialties, Incorporated, Amery, WI (715) 268-2511.
 4. Custom Rock Formliner, St. Paul, MN (651) 699-1345.
 5. Other Approved Equal Manufacturers

2.2. Integral Concrete Color Materials

- A. Integral Color additive shall consist of concentrated pigments specially processed for mixing into concrete and complying with ASTM C979.
- B. The final appearance of the integrally colored structural concrete shall mimic the color of natural limestone similar the Keystone Bridge. Provide samples for color selection and approval by the Engineer.
- C. Color Additive Delivery shall be one of the following:
1. Automated Dispensing: Meter and dispense colors using computer-controlled automated color weighing and dispensing system.
 2. Manual Dispensing: Use mix-ready powdered color additives in pre-measured disintegrating bags.
- D. Products: Subject to compliance with requirements, available products that may be incorporated in the work include, but are not limited to, the following:
1. Increte Systems, Odessa, FL (813) 886-8811
 2. Davis Colors, Los Angeles, CA (844) 341-4780
 3. Solomon Colors, Incorporated, Springfield, IL (217) 522-3112
 4. Other Approved Equal Manufacturers

2.3. Concrete Stain Materials

- A. Products: A UV-stable, water-dilutable, pigmented acrylic stain compatible with Integrally Colored Concrete, for staining of the formlined grout lines.

2.4. Concrete Curing and Sealing Materials

- A. Curing and Sealing Compound for Integrally Colored Concrete:
1. Compound shall comply with ASTM C309 for use with integrally colored concrete.
 2. Exterior Integrally Colored Concrete: Use to cure and seal exterior concrete that will be allowed to cure naturally with only occasional maintenance.
 3. Clear, solvent-borne, non-yellowing and VOC-compliant.

152035.03 - EXECUTION

3.1 Integral Concrete Color

- A. Color Additives: Mix at the batch plant in accordance with manufacturer's instructions. The responsibility for batching and mixing the color admixture shall be that of the ready mix

supplier. Mix until color additives are uniformly dispersed throughout mixture and disintegrating bags, if used, have disintegrated.

- B. Thoroughly clean mixer drum to assure absence of contaminants which may affect consistency of color.
- C. Do not place integrally colored concrete where standing water is present.
- D. Concrete mix water will not be permitted to be added to the ready mix concrete at the construction site. If greater slump is required, use water-reducing or super-plasticizing admixture; do not add water.

3.2 Formliners

- A. Clean formliner prior to each pour and ensure that it is free of any build-up. Visually inspect each liner for blemishes or tears, and repair or replace if necessary per manufacturer's recommendations.
- B. Formliner coursing shall be level. Place formliners in a fashion to minimize repeat appearance.
- C. Place liners adjacent so that seams are not visible upon completion. Securely attach formliners to forms per manufacturer's recommendation.
- D. Formlined corners shall retain individual replicated stone shapes around the corners. Ensure that the surface is free of laitance. Sandblasting will not be permitted.
- E. During loading of forms, care shall be taken to ensure adequate vibration of concrete to maintain all intended features of the formliner in the final surface and to prevent voids.
- F. Necessary construction joints shall be placed to match with the "mortar" joints created by the formliner pattern and shall not conflict with the formliner pattern. Construction joints should be minimized to the extent practical.

3.3 Formwork

- A. Design, erect, shore, brace, and maintain formwork, according to Section 2403.03 of the Standard Specifications, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Formwork shall ensure that Structural Concrete be installed according to dimensions and elevations specified in the plans.
- C. Apply form release per manufacturer's recommendations and confirm compatibility of form release with integral colored concrete and formliners. Release agents shall be non-staining.
- D. Form ties shall be made of non-corrosive materials when the portion permanently embedded in the concrete is less than 1 ½ inches from the finished surface.
- E. Leave forms in place for as long as practical, and do not strip until concrete has reached a consistent age.

3.4 Repair

- A. Fill holes and defects in concrete surface within 48 hours of form removal.
- B. Make patches with stiff mortar made with materials from same sources as concrete. Adjust mortar mix proportions so dry patch matches dry adjacent concrete. Add white cement to mortar mix, if necessary, to lighten it.

3.5 Staining

- A. Prior to applying curing and sealing product, use a multi-coat staining process to stain the joints in the formliner between the formed stones to create the appearance of grouted joints. Perform grout staining to resemble natural stone coloration matching the adjacent limestone grouted joints.
- B. Follow manufacturer's recommendation for drying time prior to applying cure and seal.

3.6 Curing and Sealing

- A. Apply a clear curing and sealing compound for integrally colored concrete according to manufacturer's instructions using manufacturer's recommended application techniques.
- B. Apply curing and sealing compound at consistent time for each pour to maintain close color consistency.
- C. Do not cover concrete with plastic sheeting.

- 3.7 Contractor shall take all necessary precautions to protect completed adjacent concrete surfaces from damage, splatter, staining or other contaminants by subsequent construction. The Engineer reserves the right to require replacement of compromised materials and surfaces.

152035.04 - METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Colored Formliner Finished Structural Concrete shall not be paid for separately, but shall be incidental to Special Retaining Wall, As Per Plan.