

**REVISION OF SECTION 601
HAND STAINED STONE FORMLINER**

Section 601 of the Standard Specifications is hereby revised for this project to include the following:

Subsection 601.01 shall include the following:

This work consists of furnishing and using form liners in accordance with these specifications and in conformity with the lines, grades, and dimensions shown on the plans.

The work includes preparing concrete surfaces designated and applying approved colored concrete stains to the finished concrete surfaces in accordance with these specifications and the plans.

Subsection 601.03 shall include the following:

601.03 Materials shall meet the requirements specified in the following subsections:

Structural Concrete Stain 708.08

The structural concrete stain shall be one of the following products or Approved equals:

1. RAINSTOPPER RS400 - Semi Transparent Stain

Textured Coatings of America

Pro-Coat Systems, Inc.

5775 Stapleton Drive North

Denver, Colorado 80216

303-322-9009

2. "Acrylic" Structural Concrete Stain

Anchor Paint Co. of Denver, Inc.

641 South Jason

Denver, Colorado 80223-2305

303-744-2361

3. Bridge and Highway Concrete Sealer, B97-Series

The Sherwin-Williams Company

543A Santa Fe Drive

Denver, Colorado 80204

303-893-1303

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The form liner pattern shall be a random ashlar stone pattern with the following properties:

1. Stone height range: 1½” to 7½”
2. Stone width range: 4” to 20”
3. Maximum relief: ¾”

As part of this contract, Contractor shall provide a full-sized, cast-in-place mock-up of the area identified on the Plans. The mock-up shall be the full height shown on the plans and at a length equal to two times the form liner pattern length, utilizing form liners, form ties, seams, and horizontal and vertical edges, as proposed for use on the project.

The Engineer will designate an area near the project for the mock-up. The mock up shall be reviewed and approved by the Engineer at least 30 days in advance of the planned start of construction of similar construction. Mock-up is to remain in place throughout the term of the project and shall be used as a reference standard for quality. Contractor will be required to remove and properly dispose of the mock-up at the completion of construction as directed by the Engineer.

Form oil shall be a non-staining petroleum distillate free from water, asphaltic and other insoluble residue or equivalent product. The form oil shall be worked into all areas, especially pattern recesses.

Subsection 601.09(f) is revised to include the following:

All concrete forms shall be treated with a water based concrete form release agent prior to placing reinforcement for surfaces to which structural concrete stain is to be applied.

In areas where form liners are to be seamed to accommodate dimensions of the forms or intent of the design, the seam shall be placed in areas that will be less noticeable. Clean, straight cuts are required on all edges.

The Contractor shall comply with the form liner manufacturer’s recommendations for the methods of securing liners to supporting formwork and the use of form liner releasing agents. Twisted wire ties shall not be allowed for securing liners to form work. It is intended that the form liners be re-utilized multiple times. All form liners may be re-used multiple times. All joint material, fasteners and care and cleaning of liners shall be per manufacturer’s instructions.

Fabricate formwork to support the form liners and the related accessories with minimum deflection. Provide method of sealing form joints to prevent loss of water from wet concrete based on manufacturer’s recommendations.

Subsection 601.09(h) is revised to include the following:

Remove forms using manufacturer’s recommended method to reduce the risk of damaging surfaces and textural impressions that are part of the liners.

Handle, clean and store forms and form liners for re-use so as not to damage form liner edges or surfaces.

Remove ties immediately after form removal. Do not remove tie cones until concrete has reached full strength in accordance with the specifications.

Notify Engineer if any surface defects are found upon removal of forms. Patch only as directed by the Engineer.

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Clean and repair surfaces of forms to be re-used in the work. Split, frayed, delaminated or otherwise damaged form facing materials are not to be re-used. Repair and replace form liners as recommended by manufacturer.

Subsection 601 .14(b) is revised to include the following:

Structural Concrete Stain shall be applied to the raised "stone" impressions created by the form liner pattern only, and shall be randomly applied using a method that will provide a variable, blended look to achieve the appearance of natural stone. The stain shall be applied to individual raised stone impressions in the following ratios:

1. 40% of individual raised stone impressions "Beige", similar to Federal Color 33722
2. 30% of individual raised stone impressions "Tan", similar to Federal Color 33448
3. 20% of individual raised stone impressions "Flesh", similar to Federal Color 30313
4. 10% of individual raised stone impressions "Light Blue-Gray", similar to Federal Color 16329

Structural Concrete Stain shall not be applied to the "grout line" impressions created by the form liner pattern. Grout line impressions shall be the natural concrete color.

The color of the Structural Concrete Stain shall have the written approval of the Engineer prior to final batching and application on the project. The final color of the approved structural concrete stain shall be determined as follows:

1. 2 foot by 2 foot samples of the colors required by the Contract, shall be submitted to the Engineer for Approval. The Stain samples shall be applied to a surface similar in texture to the concrete surface on which the stain will be applied on the project. The Stain samples shall be applied by the same methods to be used in field application. There shall be at least one raised stone impression stained each of the specific colors shown above.
2. At least three weeks prior to beginning of the application of the structural concrete stain, 100 sf test panels shall be prepared for final color Approval. The test panels shall be produced on the actual concrete surface on which the final product will be placed, at a location recommended by the Contractor and approved by the Engineer. The stain shall be applied to the test panels by the same methods to be used in the final field application. The Engineer will be allowed three business days for the stain to dry after stain application to the test panels and to issue Approval.

Concrete finishing and curing shall be completed in accordance with the specification prior to the application of the Stain. The concrete finish to which the structural concrete stain is to be applied shall be a Class 1 Finish, except as modified below:

1. Following curing of the concrete in accordance with Subsection 601.13, all projections and bulges shall be removed and the surface sandblasted. Sandblasting shall profile the concrete surface, remove all form release agents, and all other deleterious materials that would inhibit the bond of the Structural Concrete Stain. The profile of the sandblasted concrete surface shall be equivalent to Concrete Surface Profile Three (CSP 3) as defined in Technical Guideline No. 03732, "Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays" by the International Concrete Repair Institute. The Contractor shall provide a CSP 3 chip for use on the project.
2. A mortar mix, proportioned by volume, consisting of one part portland cement, two to three parts sand (conforming to the requirements of ASTM C 144), and an approved bonding agent shall be used to patch all holes produced by form ties, honeycombing, voids 1/2 inch or larger in any dimension, broken corners and edges, and other defects. The mortar mix shall include an approved bonding agent. The quantity and application procedure of the bonding agent shall be in accordance with the recommendations of the manufacturer of the

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bonding agent. Areas to be patched shall be moistened with water before the mortar is applied, and the patched area, shall be float finished and left flush with the concrete surface without checking or cracking of patches. Patching shall be done when the ambient temperature is at least 40°F. Holes deeper than 3/4 inch shall be filled in layers that do not exceed 1/2 inch in thickness.

3. Within 24 hours prior to applying structural concrete stain, the concrete surface to be stained shall be cleaned by water blasting at a minimum pressure of 3,000 psi and at a rate of 4 to 14 gallons/minute, to remove dust, dirt, and other materials that would inhibit penetration of the stain. If the surface is contaminated before application of the stain, it shall be re-cleaned as required prior to application of the stain.

New concrete shall be at least 28 Days old or as approved in writing by the stain manufacturer before the stain is applied.

Each application shall be applied at a rate of 200 to 250 square feet per gallon. (Approximately 3 mils dry film thickness.) The second application shall not be made within 12 hours of the first application.

If the surface is contaminated between applications, it shall be re-cleaned as stated above prior to the making the second application.

The stain shall be mixed mechanically and applied by spraying. Workmanship shall be such that the final stained surface is colored uniformly and presents a pleasing appearance. Any areas determined by the Engineer to be insufficiently stained shall be re-stained.

The stain shall be applied only when the ambient temperature is between 40°F and 90°F, and is anticipated to remain above 40°F for a minimum of twenty-four hours. The surface to be stained shall be dry and free of frost. The Contractor shall protect the areas to be treated from inclement weather before and after staining at no cost to the project.

Subsection 601.19 is revised to include the following:

The quantity of Hand Stained Stone Formliner to be paid for will not be measured, but will be the quantities shown on the plans in square feet, completed and accepted by the Engineer in compliance with the plans and specifications. Plan quantity exceptions will be: (1) when field changes are ordered, or (2) when it is determined that there are discrepancies on the plans in an amount plus or minus 5 percent of the plan quantity for the structure.

Subsection 601.20 is revised to include the following:

Payment will be made under:

Pay Item	Pay Unit
Hand Stained Stone Formliner	Square Foot

Payment for Hand Stained Stone Formliner will be full compensation for all work and materials necessary to complete the item and shall include, but is not limited to: water-based form release agent; sample preparation; abrasive blasting; patching materials and application; structural concrete stain and application; labor, equipment, tools, and materials necessary to complete the work.

END OF SECTION