

ITEM 555.73 11 – SIMULATED STONE MASONRY WALLS

ITEM 555.74 11 – COLORED CONCRETE SURFACES

ITEM 555.75 11 – SIMULATED BRICK MASONRY WALLS

DESCRIPTION:

This work shall consist of furnishing and installing textured and/or colored concrete walls using simulated masonry Form Liners and a color stain system designed to duplicate closely the appearance of natural masonry walls as shown on the contract documents. All work shall be in accordance with these specifications and in close conformity to the lines, grades pattern(s) and color(s) as indicated on the plans.

The completed formed concrete surface shall match the color and texture of the approved sample panel(s).

MATERIALS:

Form Liner Panels

Form Liners shall leave crisp, sharp definition of the architectural surface. Recurring textural configurations exhibited by repeating, recognizable shadow patterns shall be prevented by proper casting of form liner patterns. The Contractor shall plan on having sufficient liners available to minimize pattern repeat. Form Liners shall not compress more than 6mm when concrete is poured at a rate of 3 vertical meters per hour. Form Liners shall be removable without causing deterioration of the surface or underlying concrete. Form Liner panels shall be submitted to the Engineer for approval prior to their use.

Form Liner panels shall be capable of imprinting the surface of the concrete with a uniform and aligned pattern and texture. The panels shall be composed of elastomeric urethane, polyvinyl chloride (PVC) or ABS material designed for their intended shape and number of reuses to achieve the desired effects established in the approved sample panel(s).

Form liners to simulate stone shall have been cast from actual stone, and shall display the same distinct fracture lines and patterns characteristic of natural stone. Where no “referee” wall or panel is identified in the Contract Documents, the stone pattern shall be “random ashlar” (similar to either Scott System, Inc. #167 or Custom Rock “Blue Ridge Parkway Granite”) with a minimum variation in relief in the textured pattern of 50mm unless otherwise specified.

Form liners to simulate brick shall have been cast from actual brick, and shall display the same distinct brick surface texture, lines and pattern characteristic of the rough surface brick. Where no “referee” wall or panel is identified in the Contract Documents, the brick pattern shall be “running bond brick” (similar to either #176 “Rough Brick”, as supplied by Scott System, Inc., or #12016 “New Brick (Keyed)” as supplied by Custom Rock), with a minimum variation in relief in the textured pattern of 5 mm ,unless otherwise specified.

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Concrete -Class A or as shown in the contract documents, shall meet the requirements of Section 501, Portland Cement Concrete - General.

Release Agent When the manufacturer requires the use of an agent to facilitate the release of the Form Liner panel from the concrete, or when its use is specified on the plans, such agent shall be nonstaining and evenly spread over the entire liner surface. Formwork for custom Form Liners shall also be treated as needed. Form release material shall be on the NYSDOT's Approved List of Manufacturers and compatible with the Form Liner material.

Form Ties - designed to separate at least 25mm back from finished surface, leaving only a neat hole that can be plugged with patching material.

Color Stain – The concrete penetrating stain shall be a single component, water based, thermoplastic acrylic emulsion which carries its color and water repellent protection into the concrete. All Concrete stain shall be of the same batch and lot and shall be delivered to the application site in original sealed containers clearly marked with the manufacturer's name, brand name, type of material, batch and lot numbers, date of manufacture, and color.

Patching Material - 701-04 concrete repair material.

CONSTRUCTION DETAILS:

Quality of work -

The process of form lining, texturing and color staining of the hardened concrete shall be performed in strict accordance with the manufacturer's recommendations and as approved by the Engineer and Regional Landscape Architect.

If the quality of the application varies from the texture and color of the approved sample panel(s) at any time, or if unevenness in color, lines of work termination, etc. exist, the Engineer may have all such surfaces re-applied at the Contractor's expense. Additional coverage, if deemed required, shall be carried to a natural break-off point.

Quality Assurance -

Manufacturer of Form Liners – minimum of five years experience making molds to create textured concrete surfaces as specified in the contract documents. Submit documentation with shop drawings.

Contractor/Subcontractor (installer)- Must demonstrate a minimum of five years experience in this type of work, citing at least three projects of a similar size, complexity and scope and shall submit the following to the EIC before any work is to proceed: project names and locations; clear and detailed photographs of formed and stained concrete surfaces; names, addresses and phone numbers of architects/ owners, etc. of those specific projects. Failure to submit any of these required materials will be the basis for rejection.

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Referee Walls and/ or Panels – The Contractor may be directed in the plans to an existing real stone masonry, brick or other textured wall (the “referee wall”) and/or an existing sample panel (the “referee panel”) with architectural forming and staining treatment that will serve as the prototypes for texture, color and results for this project. Where both “referee wall” and “referee panel” are designated, the “referee wall” shall be the color and texture standard and the “referee panel” will be the technique standard that shall be used for determining acceptable results for the Contractor’s work on this project.

Color Stain System Application – Contractor must demonstrate that he/she is trained and/or authorized by the stain Manufacturer in the application and special techniques of that Manufacturer’s stain.

Technical information, training in finishing techniques and on-site support provided by the Form Liner or stain manufacturer(s) must be arranged by the Contractor as needed.

Pre-installation Meeting – Contractor, through the Engineer, shall schedule a meeting with manufacturer’s representative, installer, Engineer and Regional Landscape Architect to assure understanding of architectural concrete Form Liner use, color staining application, requirements for construction of sample panel(s), and to coordinate the work.

Submittals -

Catalog cuts, manufacturer’s literature, and technical data for the materials specified herein, including but not limited to Form Liner mold patterns, form liner, release agent, concrete patching material and color charts for staining of hardened concrete.

Photographs - color photographs of three (3) similar past projects of the Contractor and other materials under “Quality Assurance: Contractor/Subcontractor (Installer), above.

Samples - form ties, sample and description, showing method of separation when forms are removed.

Shop Drawings: The Contractor shall submit, for each sample panel, a Plan, elevation and details to show overall pattern, color treatments, joint locations, form tie locations, mortar straps and anchors and end, edge and other special conditions. For simulated stone patterns (especially random ashlar), at least 9 different panels must be created, and the shop drawing must show typical placement of the sequence of panels in a random fashion so that the pattern does not repeat on adjacent panels in any direction. The pattern must also align without visual interruption across joints.

Referee Panel: If the Contract Documents do not specifically direct the Contractor to an existing “Referee Panel” as described above under “Construction methods: Referee Walls and or Panels”, the Contractor, for each distinct pattern and/or color system specified in the Contract Documents, shall cast and submit for approval a portable sample panel, approximately 0.4SM in size, which will clearly show the required texture and coloration.

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Such panel(s) will be resubmitted until accepted by the Engineer, and shall serve as the basis for a full-scale sample panel as described below.

Form Liner and Color Stained Concrete Sample Panel(s) – (Note that texture and color will be approved separately and sequentially as follows): The Contractor shall build on site before cast-in-place concrete work to be textured and colored, one sample panel for each distinct pattern and/or color system specified in the Contract Documents, using the same materials, methods and work force that will be used for the Project. Location on site for construction of sample panel(s) shall be as approved by the Engineer. Concrete shall be placed in the sample panel(s), texture constructed and construction procedure adjusted as many times as required, and at no additional cost to the State, until a final texture and color is produced that complies with the color and texture of the “Referee Wall”, “Referee Panel” or approved portable sample panel. Since the Contractor must allow sufficient time for the approval process, sample panel(s) shall be initially constructed on site a minimum of sixty (60) days prior to anticipated actual production work.

- Size (of each required sample panel)- minimum five (5) square meters for simulated stone masonry.. This minimum shall be increased as necessary, at no additional cost if needed to adequately illustrate the pattern, texture and detailing specified to be matched.
- Include an area to demonstrate simulated stone masonry butt joint, continuation of pattern through expansion joint, around a corner, and cap detail if it is applicable to the job requirements.
- If design includes stone, or other texture across top of wall, include in sample panel.
- After concrete work on sample panel has cured sufficiently, prepare the surface for color staining. After the Engineer has approved of the prepared surface of the cast textured sample panel for color staining, the work of form lined cast-in-place concrete for permanent work may proceed using approved sample panel as quality standard, except that color staining for permanent work is not yet authorized.
- After a 30 day cure of the texture approved sample panel and last pour of form lined concrete wall to be color stained, the texture approved sample panel shall be color stained. The Contractor shall adjust and/or re-stain the texture approved sample panel as many times as required, at no additional cost to the state, to achieve the specified color match(es). After coloring is determined to be acceptable by the Engineer, construction of the remaining work under this Special Provision may proceed, using approved sample panel as quality standard.
- Remove sample panel as directed by the Engineer.

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NOTE: The EIC, if appropriate, may allow the Contractor the option to create sample panel(s), including staining, off-site and bring them to the site for approval. If an existing “referee wall” is identified in the contract documents, the sample panel shall be set up next to the referee wall for comparison. Such mockup shall be simultaneously compared to that real wall and any “referee panel”, whether made available to the Contractor or created by the Contractor.

Scheduling - schedule color stain application after adjacent earthwork is to rough grade, to avoid contaminating or damaging the surface. Place topsoil, establish turf and/or plant adjacent areas only after staining application is completed. Coordinate the work to prevent interference with other trades.

Contractor responsibilities:

- . Ship form liners.
- . Install liner.
- . Apply release agent.
- . Install concrete in accordance with Plans and Specifications.
- . Hand carve top exposed textured surfaces if required on the design plans.
- . Remove form liners (within 24 hours.)
- . Clean form liner between pours.
- . Patch, grind, and bush hammer form liner seams as required.
- . If project is to be stained, provide and erect scaffolding and tenting if necessary; provide heat if required, and clean water for power washing of the hardened concrete.
- . Power washing and patching of form liners.
- . Supply shop drawings for patterns, as necessary.
- . Meet all other qualification and submittal requirements

CONSTRUCTION DETAILS

Unexposed Areas - Unless the contract documents specify otherwise, texturing will extend 300 mm below finished grade and, where area adjacent to a given textured surface will have soil placed against it, staining will extend to a minimum of 150mm below finish grade. Remaining areas of surfaces that will not be exposed in the final product will not require form liners or staining.

Extra Concrete - The forms shall be placed so that on the textured face the minimum concrete cover to the reinforcing steel at all locations meets the following:

- a. Cast-in-place Concrete - 50mm
- b. Any larger minimum cover specified in the contract documents.

This may require increasing the width of the pour by the relief of the form liner.

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Liner to Form Attachment System - Securely attach form liners to forms with wood or sheet metal screws; threaded inserts added to the back of the form liner for bolts to fasten the form liner through the forms; or bolts through the face of the form liner with flat heads, inserted in a pattern joint and through the form liner and forming system. Construction adhesives may be used, but not on reusable forms. Place adjacent form liners with less than 6mm separation between form liners. Joints between panels shall be sealed, taped or fused to form a watertight seal, according to the manufacturer's instructions. Metal form ties are not to be placed closer than 38 mm to the interior surface.

Release of Form Liners From Hardened Concrete – NYSDOT Approved List release agents, if required shall be utilized and applied to the form liners before the concrete is poured. Release agents shall be applied in strict accordance with release agent manufacturer recommendations. Hand-charged sprayers will only be allowed if a thin uniform coating of release agent is obtained on the liner.

Form Removal shall be in accordance with Section 555 of the NYSDOT Standard Specifications. The form liners may be detached from the forms and then removed from the concrete, or they may remain attached to the forms and the entire forming system removed from the concrete. Remove the form liners from the top, down. Curing of concrete shall proceed in accordance with Section 555 of the NYSDOT Standard Specifications. Curing covers or wet burlap and curing covers shall be used. Curing compounds shall not be used, as they are incompatible with the color staining material.

Care and Cleaning of Form Liner - Form liners shall be cleaned the same day they are removed from the wall with a power wash and mild detergent. Synthetic brushes with stiff bristles may be used on stubborn areas. Mild acid washes may also be used. Solvents shall not be used. If necessary, patching of holes shall be performed with 100% clear silicone caulk. Form liners shall be stored inside or under a protective, non-transparent cover, in a vertical position.

Wall Patching and Preparation - After form liners are removed from the hardened concrete, the textured uncolored surface shall be prepared for color staining. All holes larger than 10mm in greatest principal dimension shall be filled with concrete patching material in accordance with Section 701-04 of the NYSDOT Standard Specifications, as approved by the manufacturer and Engineer. Any such patching shall be hand-shaped to meet adjacent surfaces and otherwise blend in and match the character of the particular texture in which it occurs. The proposed patching material shall be used on the test panel to ensure compatibility with the color staining system. All honeycombed areas shall be filled and textured to match surrounding areas. Seam lines and other unnatural protrusions shall be ground down to match adjacent areas with a hand-held power grinder using discs made for concrete.

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Grinding of Seams shall be performed immediately after removal of the form liners. Perform final bush hammering to blend defects and ground areas into the final texture. In particular, the process of wall patching and preparation shall be subject to approval of the manufacturer and Engineer.

Joints - Construction and expansion/contraction joints shall extend to the full depth of the concrete at the locations shown on the plans. When construction joints are needed but not shown on the plans, the Contractor and the Engineer shall agree on the proper locations of such joints so as not to distract from the appearance of the imprinted pattern and to minimize the possibilities of cracking.

Relief - The depth of relief specified and shown on the plans shall not be varied.

Color Staining (by manufacturer) - the hardened concrete, including any patching, shall be a minimum of 30 days old before color is applied. Clean surface prior to application of stain material to assure that surface is free of laitance, dirt, dust, grease, efflorescence, paint, or other foreign material, following supplier's instructions for surface preparation. Do not sand blast. Preferred method to remove laitance is pressure washing with water. Completed surface shall be free of blemishes, discoloration, surface voids and unnatural form marks. After the wall has dried, the color staining process is applied using colors approved by the Engineer. Water-based stains shall be used in air temperatures between 8 degrees C and 32 degrees C. Stain also shall not be applied unless weather conditions will permit complete drying of material prior to rain, fog or dew. Adjacent surfaces not to receive stain shall be masked.

Special Techniques for Forming Textured Concrete -clean Form Liners and make free of buildup prior to each pour. Inspect for blemishes or tears. Repair if needed following manufacturer's recommendations.

If texture is to continue across top of a formed wall, the formed pattern must be replicated by hand while the concrete is still plastic. Hand carve the concrete, aligning rustication joints with those in the formed pattern to achieve the desired relief and texture.

If the pattern selected has molds connecting through the middle of features such as simulated masonry, carefully remove the seam line created by abutting molds and match the texture and shape of the surrounding masonry, avoiding visible seams or mold marks.

Special Techniques for Applying Color Stain System

A. Simulated Masonry Surfaces:

Colors shall be applied by a combination of hand wiping, spraying, sponging, brush painting, ragging or other methods approved by the Engineer, with as many layers and patterns as necessary to achieve believable coloration within masonry and natural random variation from masonry to masonry, including variations due to oxidation and flecking,

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rusting and/or organic staining from soil and/or vegetation, as exhibited in the “referee wall” and/or “referee panel”.

Simulated “Mortar lines” shall be colored as determined from the actual masonry “referee wall” and/or “referee panel”. Simulated Mortar lines can be created either by leaving an acceptable base color with no further stain as additional color is added within limits of each masonry units in the pattern, or by applying an acceptable “grout” color after the masonry units are stained. Regardless, a believable appearance of mortar lines similar to the “referee wall” and/or panel must be achieved.

B. Colored Concrete Surfaces:

Where portions of the work require staining only, such colored concrete surfaces shall match the coloration approved for Simulated Masonry Surfaces above and shall be applied in the same manner, by the same qualified personnel.

METHOD OF MEASUREMENT

This work will be measured for payment as the number of square meters of “Simulated Stone Masonry Walls”, “Simulated Brick Masonry Walls” or “Colored Concrete Surfaces” actually installed and treated to the satisfaction of the Engineer. The quantity shall be computed from payment lines shown on the plans or as established by the Engineer in writing. Measurement will be taken at the vertical as the vertical plane projection of the treated location. No measurement will be taken of actual concrete surfaces.

BASIS OF PAYMENT

Work for “Simulated Stone Masonry Walls” and “Simulated Brick Masonry Walls” will be paid for at the contract unit price per square meter, which price shall include all sample panels and their removal, form lining, hand carving, color staining, extra concrete needed because of the use of the form liners, releasing agents, caulking compounds, patch mix, specific responsibilities of the Contractor specified herein, and all materials, supplies, labor, tools, and equipment incidental thereto.

Work for “Colored Concrete Surfaces” will be paid for at the contract unit price per square meter which price shall include sample panel, color staining, specific responsibilities of the Contractor specified herein, and all materials, supplies, labor, tools, and equipment incidental thereto.