

ITEM 583.6001 11 – SCULPTED SHOTCRETE FACING FOR SKATEPARKS
ITEM 583.6002 11 – SCULPTED AND STAINED SHOTCRETE FACING FOR SKATEPARKS

DESCRIPTION

This work shall consist of furnishing and installing shotcrete and/or stained shotcrete facing at the locations indicated in the contract documents and as ordered by the Engineer.

MATERIALS

The following sections of the standard specifications apply:

Shotcrete – Materials	§583-2
PVC Plastic Drain Pipe System	§706-15

PVC Connector and Drain Pipes: Provide schedule 80 PVC connector and drain pipes.

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. The concrete penetrating stain shall comply with New York State Laws regulating the use of volatile organic compounds and solvents.

The addition of concrete accelerators may have an adverse effect on the color application adhering or reacting with the cured shotcrete. Concrete accelerators having such an adverse effect on the color application shall not be used.

CONSTRUCTION DETAILS

General: The construction of the sculpted (and stained) shotcrete facing for skateparks shall produce a skatepark finish shotcrete facing by hand sculpting to the depths indicated and as required to achieve specified texture(s) (see below). The intent is to achieve a smooth continuous surface on slopes suitable for skating.

The facing shall be finished to simulate the color and texture of the skating surface of any sample panel provided as information available to bidders and as shown in the contract documents. Producing a suitable skating finish will require careful sculpting and smoothing of the shotcrete face. The texture and color shall closely resemble that of the approved visual standard panel.

Design and Fabrication: The Contractor shall submit three (3) sets of construction details including shotcrete thickness, welded wire fabric, steel support posts for the welded wire fabric, shotcrete mix design, stain colors, paints and MSDS data sheets at least two weeks prior to the beginning of construction. The Contractor must receive notification that the proposed mix design and method of placement are acceptable before shotcrete placement can begin.

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Sculpted Shotcrete Facing: Provide a minimum thickness of 150 mm of shotcrete in all surface locations.

Permanent Shotcrete Facing Tolerances: Construction tolerances for the permanent shotcrete facing prior to installing the sculptured face are as follows:

Horizontal Location of Wire Mesh; Rebar; Headed Studs on Bearing Plates, from Plan location; ± 10 mm.

Headed studs location on bearing plate, from plan location: 6 mm.

Spacing between reinforcing bars, from plan dimension: ± 25 mm.

Reinforcing lap, from specified dimension: -5 mm.

Complete thickness of shotcrete, from plan dimension: -5 mm.

Nail head bearing plate, deviation from parallel to wall face: 10 degrees.

Shotcrete Placement And Sculpting Process: All the provisions of Section 583-3 shall apply except as modified below:

1. Shotcrete shall not be applied to existing concrete surfaces.
2. The final shotcrete wall thickness shall provide a minimum of 50 mm of cover from the deepest sculpted recess over all embedded materials in the wall.
3. The production of Test Panels according to Section 583-3.03 C shall be required, separate from the above specified Visual Standard Panel.
4. If required, install additional steel reinforcement for the permanent, aesthetic sculpted shotcrete facing in accordance with the approved design. Provide a minimum cover thickness of 50 mm around all reinforcement.
5. When a layer of shotcrete is to be covered by a succeeding layer or layers at a later time, it shall first be allowed to develop its initial set. Remove all laitance, loose material, and rebound by brooming or scraping. Remove laitance that has achieved final set by sandblasting or pressure washing, and thoroughly clean the surface prior to staining.
6. Sculpt, carve and shape the nozzle-applied shotcrete so that no water can be trapped or form puddles in the folds and crevasses of the sculpted shotcrete.

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7. The permanent shotcrete facing shall be sculpted and carved in such a way that the finished surface closely resembles the appearance, texture and features of the mock-up panel(s).

Shotcrete Curing: Shotcrete shall be cured a minimum of seven (7) days prior to application of final color.

Drain Pipes: After completion of the sculpting process, drain pipes used for weeps shall be cut off flush with the finished shotcrete surface.

Shotcrete Staining:

1. All permanently exposed shotcrete surfaces shall be stained, if necessary, to match the coloring of the sample panel. Prior to staining, all permanently exposed shotcrete surfaces shall be prepared according to the staining manufacturers recommendations.
2. At the time of the stain application, both the shotcrete and the air temperature must be between 8°C and 32°C. Stain shall not be applied unless weather conditions will permit complete drying of material prior to rain, fog, dew or temperatures beyond the prescribed limits. Areas not to receive stain shall be masked.
3. Shotcrete staining shall consist of applying a minimum of two separate applications of at least two stain colors to all sculpted shotcrete (architectural surface treatment) such that the sculpted wall face demonstrates individual color variations and character to match that of the visual standard panel. Staining shall only be performed when the entire sculpting is complete and not performed during sculpting construction.

Qualifications of Contractor: The installation of all shotcrete work shall be completed by a specialty contractor skilled in skatepark and shotcrete work. The Contractor shall submit the appropriate qualifications for approval 45 days prior to the sculpting production work. Potential specialty contractors shall submit the following:

1. A signed statement of experience certifying that the specialty contractor is an established business with a minimum of five (5) years experience and indicate in detail experience in successfully constructing colored and textured skatepark surface work.
2. Photographic proof and reference material for evaluation experience and ability to perform, including photographs to show the Contractor's capabilities to construct colored and textured skatepark surfaces and also including a list of completed projects and references which demonstrate these capabilities. These projects and photographs of projects must have been the work of those craftsman and artist proposed for this work.

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3. Full documentation of the crew, including resumes of lead personnel (structural engineer, and final texturing and finish experts, et al) lists of specific personnel to be used, and details of each listed person's experience and abilities to perform all phases of construction to the RLA's satisfaction. Provide a Lead Sculptor to supervise the work for both the work and the application of final color. At a minimum the Lead Sculptor must have five (5) years experience in large-scale skatepark finish production work. The Lead Sculptor's resume should show a minimum of five (5) years experience in the management of project crews, as well as experience in coordination with other trades in the completion of simulated exhibitory fabrication projects under the Section. The Lead Sculptor will be responsible for consistency of aesthetic finish between different crews and consistency of overall finished appearance throughout the project.
4. Submit, as proof, written documentation of the finishers and nozzlemen's qualifications. Minimum qualifications include experience on at least three projects in the past three years in similar shotcrete application work. In addition, the nozzlemen must demonstrate the ability to satisfactorily place the concrete. This will be based on either ACI certification or satisfactory completion of preconstruction visual standard panels.

Visual Standard Panel Mock-Up: This work consists of construction of visual standard panel mock-ups for evaluation and will be the basis for acceptance of production work. Visual standard panel mock-ups shall require approval from the EIC in consultation with the RLA. The Contractor shall provide a visual standard panel matching the texture and coloring pattern of any sample panel provided as information available to bidders and as described in the contract documents. The advance submittal of this visual standard panel shall allow enough time for the Contractor to correct any differences between the visual standard panel and the sample panel. The Contractor shall construct large-scale mock-ups in accordance with the requirements for the actual production work. Mock-ups that do not comply with the requirements for production work and which cannot be used to evaluate the desired aesthetic effects, as noted herein, will be rejected. The Contractor shall reconstruct new mock-ups at no additional cost to the Department. Mock-ups shall be constructed at a site designated by the Department and shall be completed a minimum of thirty days before the sculpting production work starts. Crews shall use the same equipment, materials, mix design, and application procedures to construct the mock-up as proposed for the project production work. The mock-ups shall meet the following size and construction requirements:

1. Foundations and other means and methods to support and stabilize the mock-ups are the responsibility of the Contractor.
2. The application of color shall be coordinated with the sculpted shotcrete work for both the mock-up and skatepark finish shotcrete surface.
3. Size: 1 meter high by 3 meters wide or larger to adequately illustrate the pattern and texture selected. In addition, each work crew is required to demonstrate the sculpting procedures

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and color application techniques consistent with the mock-up. Demonstrate continuity of sculpting procedures across expansion joints and across joints in precast concrete panels or lagging, if such joints are indicated on the contract drawings. Do not perform any color application until a coloration scheme is developed and the mock-up is approved.

4. The Contractor shall coordinate with the color application manufacturer and the shotcrete material supplier prior to constructing the mock-up to establish compatibility of materials. After sculpted features of the mock-up panel are recommended by the Lead Sculptor and approved, apply the color based on the developed coloration scheme and the manufacturer's recommendation.
5. After the color application technique and color scheme are recommended by the Lead Sculptor and accepted, production work on the project may proceed using the mock-up as the quality standard. All production work utilizing the accepted surface features, color application techniques, and color schemes depicted on the mockup(s) shall meet the same quality standards that are visible on the mock-up(s).
6. The manufacturer's literature shall include materials specifications, physical properties, including ASTM test methods utilized, manufacturer's recommended application rates for the various surface textures and porosity, current application instructions, and Material Safety Data Sheets (MSDS) shall accompany the accepted visual standard panel. The Contractor must comply with all safety instructions during all applications.

METHOD OF MEASUREMENT

The work will be measured as the number of square meters of sculpted shotcrete facing furnished and installed. The completed facing shall be measured to the "neat lines" of the facing as shown in the plans. The quantity of sculpted shotcrete facing will be computed to the nearest 0.1 of a square meter.

BASIS OF PAYMENT

The unit price bid per square meter shall include the cost of all labor, equipment and materials necessary to satisfactorily complete the work. Incidentals include, but are not limited to, qualification(s) documentation, manufacturer's literature, construction and removal of visual standard panel mock-up(s), steel reinforcing, premolded joint filler, polyethylene bond breaker strip, joint sealant, PVC pipe for weep holes, exterior surface finish, and staining. Payment will be made under:

Item No.	Item	Pay Unit
583.6001 11	Sculpted Shotcrete Facing For Skateparks	Square Meter
583.6002 11	Sculpted And Stained Shotcrete Facing For Skateparks	Square Meter