

ARCHITECTURAL CONCRETE FLATWORK

by Michael J. DeCandia

Defined in simplest terms, concrete flatwork is a horizontal application of concrete that can be walked on or driven on. To be considered architectural, however, flatwork should comply with Dan Dorfmueller's definition of providing "an aesthetic quality beyond its functional purpose." (see page 13).

The most widely recognized method of accomplishing aesthetic quality in flatwork is through the use of colors and textures. Concrete often considered utilitarian can be cost-effectively modified to create aesthetically pleasing hardscapes.

Architectural flatwork is used to express the playfulness and whimsy of theme parks such as Great Adventure in Jackson, NJ, Epcot Center in Orlando, FL, and Euro Disney in France.

It can be used as dressing for an historic district. The 44-block front sidewalk replacement on Columbus Avenue in New York used architectural concrete flatwork to recall bluestone pavement, the original sidewalk material.

The rehabilitation of the perimeter sidewalks in Brooklyn's Prospect Park required an exposed aggregate finish to conform to the park's antiquity. Leonard Ferrara of Ferrara Bros., a ready-mix supplier in Queens, NY, said "The challenge here was to replicate the paving as true to the existing as possible. We worked with our stone suppliers as well as our supplier of colored admixtures

to select materials, and then manipulated the mix design and finishing techniques to achieve the desired appearance."

At 101 Hudson Street in Jersey City (see cover photo), integrally color-conditioned concrete was given a sandblasted finish to assume the color and texture of a thermal-cut granite entrance while imprinted concrete created an appearance of four-inch-square granite sets, a curb line alluding to the city's historical past.

In publicly funded and large paving projects, architectural concrete can provide aesthetically pleasing hardscapes within the confines of budgetary constraints. Examples include the reconstruction of Avenue of the Americas from West 4th Street into the 40s, the sidewalk around Madison

Square Garden, and Grand Army Plaza in Brooklyn, as well as many parks and playgrounds.

Color in Concrete

One method of producing color in concrete is to use a color-conditioned admixture to integrally color the concrete. A wide variety of earth-tone colors can be achieved, from warm beiges to browns, grays and reds.

Color-conditioning admixtures can be used anywhere that concrete is used – cast-in-place, precast, exposed aggregate, sandblasted finish, and vertical placements. A good-quality color-conditioned admixture will not affect the air-entraining properties of concrete.

There is a limit on the intensity of color that can be achieved as a result of the graying effect of cement. However, for special project and design considerations, the use of a white Portland cement will extend the color palette beyond the traditional limitations of gray cement.

At the United States Holocaust Memorial Museum in Washington, D.C., a color-conditioning admixture and concrete containing white Portland cement were used to simulate limestone. Reg Hough, who was with Pei Cobb Freed & Partners at the time of design, said that using color-conditioned concrete allowed for design flexibility where limestone could not be used, such as in special shapes and long lintels.



At the Credit Lyonnais Building, 1301 Avenue of the Americas in New York, single unit pavers allow for grid patterning. (photo: L.M. Scofield Co.)

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Adding Texture to Color

Special effects can be achieved by using the same colored concrete mix and altering the surface texture. This does not truly alter the color but rather makes the surface appear to be different due to the reflection of light from the surface or to the level of aggregate exposure. Generally, coarser textures create more shadows and appear darker.

A sandblasted finish allows for closer approximation of dimensional stone. Concrete flatwork can also be textured by the use of a surface retarder. In this process, a given amount of paste on the surface is removed after the initial set to reveal the aggregates in their natural state. This creates a surface that generally appears coarser than a sandblasted finish. This will often serve to slow or repel pedestrian traffic.

Dry-Shake Color Hardeners

Bolder, brighter colors can be achieved through the use of dry-shake color hardeners, a pre-packaged material which is broadcast onto the surface of newly placed concrete, floated in, and finished. As a result of the concentration of the material at the surface, a rainbow of colors can be attained, from white to black with true blues available.

Dry-shake hardeners are usually the primary coloring agents used in the imprinting of concrete. Color hardeners are used with large imprinting tools

to create patterns and textures including cobblestone, brick, granite sets, wood and many other patterns. Jim Thorsen of the New York City Housing Authority comments that "The use of imprinted concrete allows for a cost-effective, durable and theft-proof paving."

Concrete in Interiors

Interior use of architectural concrete has risen greatly in popularity recently. Chemical stains are a coloring method used on existing concrete or fully hydrated newly placed concrete. Chemical stains are aqueous solutions of metallic salts that create a variegated, time-worn patina on an existing concrete surface.

The stains produce an uneven mottled color which, in appear-

ance, is much like the shadings of natural stone. The resulting patina is unique to each concrete surface.

For depth of color, chemical stains can be applied to either integrally colored concrete or color-hardened concrete. Sawcuts and grouting techniques can define patterns and create a vibrant mosaic motif of various earth-tone colors.

"The use of stained concrete is clearly on the rise," states Amedeo Cilli of Concrete Concepts, a contractor whose firm specializes in architectural concrete. "The use of architectural concrete on interior floors can create a surface that is not only durable and elegant, but also cost-effective, especially when compared to other interior alternatives."

Local examples of interior floors include Le Bat Bar on West 57th Street, Starbucks on Astor Place, and the Rain Forest Cafe at The Source in Westbury, LI. ■

About the Author:

Michael DeCandia is Northeast District Manager for L.M. Scofield Company which manufactures coloring and texturing systems for concrete. Projects in which he has been involved include the US Holocaust Museum in Washington, D.C., renovations to Madison Square Garden, and various Disney World projects.



Uncolored concrete, and a dark gray colored concrete in a sponge float finish, were used at the Daily News Building in New York. (photo: L.M. Scofield Co.)