

Out of the Stone Age: The evolution of decorative concrete continues to stretch the horizons for an ancient building material

By Howard Jancy

Jancy & Associates

Concrete is an ancient building material. Mother Nature created the raw materials for cement millions of years ago, and early Egyptian, Chinese, and Roman cultures built great cities using it. Monuments of those cultures—the pyramids, the Great Wall of China, the Colosseum—still exist today, with concrete (albeit crudely formulated) comprising a significant building material in these landmarks.



Geometric shapes and bold colorations, reminiscent of the Art Deco period, are readily incorporated into today's architecture with decorative-concrete (Photo courtesy of Concrete Décor)

Contemporary concrete usage has evolved beyond its origins as a basic construction material. It can be manipulated into structurally creative and artistic expressions, defying common perceptions of what a mixture of sand, cement, stone, and water should look like. Concrete's "green" building qualities have also contributed to this evolution; rather than simply being disposed of, it can be recycled and reused, providing years of additional service and attractiveness.

Evolution of thought and technique regarding concrete

Art Deco architecture and interior design, of French origin and with export to the U.S. during the Roaring '20s, provide early examples of decorative concrete. The strong lines, geometric patterns and sweeping curves that are signature features of the Art Deco style were further emboldened by translucent colored stains with a palette *de la nature* (from nature), for beautiful concrete floors.¹ While it reigned as a unique period for decorative arts from the 1920s to the 1940s, the Art Deco style declined after that, along with the interest in artistic creativity with concrete.

Curiosity in decorative concrete was rekindled again in the 1950s. Concrete contractor Brad Bowman developed methods and tools to pattern or stamp fresh concrete. Introducing color, texture and pattern to concrete enjoyed another renaissance in the 1970s when designers and contractors, long familiar with concrete's physical strengths, began to appreciate its inherently attractive features.





Evocative, tactile and illusive: qualities of concrete that are influencing trends in decorative concrete. (Photo courtesy of Mike Miller, The Concretist)

Today concrete is no longer viewed as simply a gray, flat, featureless material, but one possessing qualities that can be described in design terms. Brad Bowman's early success with stamped concrete may have been the catalyst for decorative-concrete innovation, but it was the larger realization that concrete offers almost limitless potential for architectural expression that has propelled the industry to the range of diversity seen today.

Gray as the new 'green'

Concrete is one of the most versatile building materials available, and can be designed and placed to the most exacting structural demands or the most discerning aesthetic requirements. It also ranks as one of the more sustainable building materials—starting with the extraction and processing of raw materials and extending through the eventual recycling or reuse of concrete structures.

Relatively new technologies such as polished concrete have taken this basic building material into new directions that can contribute to sustainable-building practices.

Imagination + engineering

Travel to any of the Disney or Paramount theme parks, and the visitor will see numerous examples of decorative-concrete paving. Mickey and his employers, thrilled by the playful possibilities of colored concrete, challenged designers and contractors to produce concrete paving as imaginative and magical as the rest of the park.

The strengths of ready-mixed concrete, combined with the fantasy of creative designers, produced incredible results. Not only did the theme parks get innovative and natural-looking walkways with great eye appeal, they also got pavement with a high degree of durability. Those same qualities caught the attention of other themed venues such as zoos and water parks; commercial centers such as shopping malls and casinos; and public places including museums, parks and schools. The extensive exposure that stamped and stained concrete received in malls and casinos fueled the interest in concrete floors for other commercial and residential projects.

Interior floor installations are producing some of the most innovative and creative examples of decorative-concrete techniques. Applicable to new construction or the renovation of building with older existing concrete, these installations can deliver floors that meet the owner's expectations for budget, function, and aesthetics.

These decorative techniques include the use of concrete stains and dyes, which can reproduce colors often found in natural earth and rock. Stains allow for truly unique concrete installations that complement a variety of hardscape and flooring designs.

Chemically reactive stains

Including a limited range of translucent, potentially highly variegated, and mottled earth tones, chemically reactive stains consist of metallic salts in an acidic solution. The acid reacts with the cement component of the hardened concrete. Most manufacturers offer a limited range of standard colors, and custom colors are difficult to produce. Faux painting techniques, however, can broaden the palette of colors and create many interesting effects.

Non-reactive stains or dyes

These coloring systems encompass a broad range of translucent, mottled hues, and are based on pigment concentrates mixed with water or acetone, depending on the manufacturer. As with the chemically reactive materials, non-reactive stains and dyes are also applied to hardened concrete.

Non-reactive stains and dyes are often utilized when chemical stains cannot produce the desired color due to limited palette or in cases where the required chemical reaction cannot be achieved. Also, custom colors are more readily available with non-reactive stains and dyes. Colors can also be produced in the field; for example, dark brown can be mixed with white to produce a light brown. Additionally, if concerns exist regarding application of an acid-based material, non-reactive coloring systems offer an alternative.

It should be noted that not all dye products are UV stable for outdoor use. Also, application of a sealer is recommended after the staining process is completed.

Opaque stains

Opaque concrete stains are available in a wide range of colors, and usually offer more colors than the chemical and non-reactive stains. The color produced is uniform and will completely hide or mask the underlying concrete color.

Depending on the manufacturer, opaque stains are available as single- or multi-component systems that are mixed with water. They deliver a low-gloss and abrasion-resistant surface, and are suitable for coloring existing interior concrete floors and exterior concrete hardscapes. They are used to recolor previously colored concrete or to renovate weathered or discolored concrete surfaces. Sealing after applying an opaque stain may not be necessary.

Generally, manufacturers provide a different color chart for each product. Even though comparable hues may be found among different coloring systems, the products come with their own distinct palettes and attributes. It is advisable to contact the manufacturer to verify that their stain product is aesthetically and functionally suitable the given project.

Some guidelines and recommendations on application of stains and dyes are discussed in [*Success with stains can hinge on removal of contaminants, other substances on surface.*](#)

Polished concrete

One concrete treatment that has experienced something of an explosion in popularity—the mechanical grinding, densification, and polishing of concrete floors—offers a relatively economical, durable and attractive option for commercial and institutional settings. Polished-concrete flooring also offers environmental benefits for the building’s owner and occupants.²

Polished concrete serves as a notable example of concrete’s “green” attributes. This process can contribute to certification under the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED™) rating system in the following ways.

- Concrete-floor restoration reduces the environmental impact that new construction or demolition would cause.
- The thermal mass of a polished-concrete floor reduces heating and cooling loads, saving on energy consumption.
- Leaving concrete exposed as a finish reduces exposure to allergens and environmental pollution from the volatile organic compounds (VOCs) associated with many other floor-covering installations, floor treatments, and maintenance.
- The exceptional durability of polished-concrete floors contribute to sustainability, in that demolition or disposal effects are reduced or eliminated.
- Polished concrete floors are fire resistant.
- Highly polished and reflective concrete floors often allow owners to reduce lighting and energy consumption.
- The maintenance procedures for polished concrete floors are environmentally safe.

Even though concrete slabs are quite strong and wear resistant, the grinding and polishing process enhances these properties by exploiting the concrete’s natural pore structure with penetrating chemical densifiers that diminish the surface’s wear and increase dirt resistance under high-traffic conditions. The application the densifier enhances the concrete surface’s shine, durability, and maintainability. These attributes make polished-concrete floors a popular choice when designing for aesthetics, functionality, or both.

It should be noted that the U.S. Green Building Council’s LEED rating system is also applicable to exterior concrete hardscape construction. See accompanying story: [*The cool metric adds to ‘green’ profile of concrete in standard gray, other shades.*](#)



Polished concrete, combined with patterns and stains, provides attractive, durable and environment friendly floors (Photo Courtesy of Concrete Décor)

Other decorative and coloring techniques

Although beyond the scope of this article, the bold new frontiers of concrete treatments and artistry include the use of integral coloring, dry-shake color hardeners, stamping, stenciling, abrasive blasting, and combinations of coloring and texturing techniques³.

Future of decorative concrete

As we continue to see advances in grinding/polishing equipment, liquid densifiers, and installation techniques, polished concrete and other forms of architectural concrete will enjoy greater use as an environmentally responsible building method and material.

The pioneers of the decorative-concrete industry are forward thinking, looking to the horizon for the next unique process for adding excitement to concrete. Some of those early innovators are starting to shape the next trend, speaking of concrete in more animate terms, a concrete that draws from the imagination for its design, and engages the senses once in place and underfoot⁴. So, far from over, the evolution of decorative concrete vigorously continues.

References

1. Jancy, Howard. "Concrete Stains and Dyes: Surveying the color spectrum." *Journal of Architectural Coatings*, Vol. 5, No. 6 (2009):18-24.
2. Jancy, H., Schweitz, G. "High Gloss Finishes—Creating new floors with polished concrete." *Construction Specifier*. December 2006: 42-54.
3. Farny, J., Collins, T. "Coloring of Concrete: Transforming a Gray Area." *Journal of Architectural Coatings*, Vol. 4, No. 6 (2008): 22-31.
4. Camar, Chris. "Artisan in Concrete: The Concretist Inc." *Concrete Décor*, Vol. 7, No. 1 (2007)

About the author



Howard Jancy, CSI, CDT, is president of Jancy & Associates, an architectural-consultant and manufacturer's-representative firm based in Chicago. He has more than 22 years of experience in the decorative-concrete business, in sales, training, technical service, architectural promotion, specifications, technical writing, and new-product and business development.



Jancy & Associates provides representation for building-material manufacturers and specialty contractors, creating greater visibility within the design community and opportunities for increased sales.

Howard Jancy

Jancy is a member of the CSI Chicago chapter and is chairman of the chapter's Industry Round Table, which offers professional-development seminars for members. He conducts an annual class about AIA-compliant programs for architectural continuing education. He has written articles for a number of industry publications, including *Concrete Décor*, *Landscape Contractor National*, *Journal of Architectural Coatings*, *Construction Specifier*, and *Concrete Construction*.

Jancy has a bachelor of science degree from the University of Illinois, is an ACI certified Concrete Technician, and is certified by CSI as a Construction Documents Technologist (CDT). He was a founding board member of the Decorative Concrete Council and has been an affiliate member of the National Ready Mix Concrete Association (NRMCA), the American Society of Landscape Architects (ASLA), American institute of Architects (AIA), and the American Concrete Institute (ACI).

Durability + Design ©2010 Technology Publishing Company