Vol. 6 No. 2 • April/May 2006 • $6.95

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The Journal of Decorative Concrete

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Wood Gets a Makeover

Admixtures and integrally colored concrete

Grand Design: Innovative uses for form liners

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CIRCLE NO. 01

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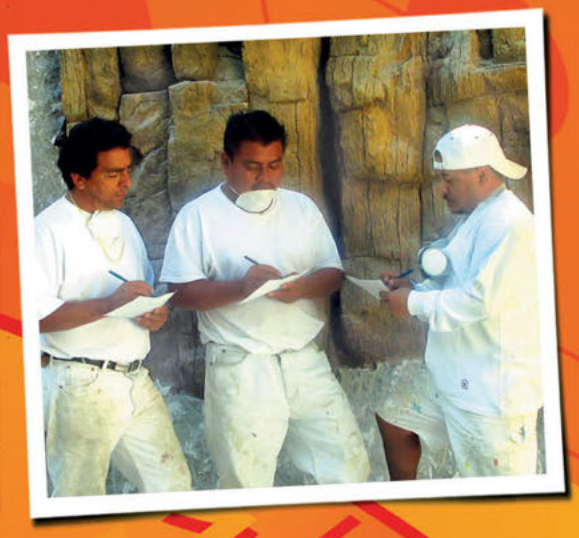
EMPLOYEE TIMESHEET

NAME: Frank Gomez DATES: 10-14

DAY	START	LUNCH	END	JOBSITE	WORK DONE	HOURS
MON	7:00	½	3:30	Walby		8
TUE			3:30			8
WED			4:00			8½
THU			4:00			8½
FRI	↓	↓	4:00	↓		8½

Employee Signature: Frank Gomez TOTAL HOURS: 41½



Reality?

Employee Report

Frank Gomez

Jobsite Name: **Walby Property** Date Range: **4/10/2006 through 14/14/2006**

Day	Start	End	Activity		
Mon 4/10	7:08 AM	12:05 PM	Prep	4:57 hours	
	12:41 PM	3:22 PM	Prep	2:41 hours	7:38 hours
Tue 4/11	7:12 AM	12:07 PM	Formwork	4:55 hours	
	12:43 PM	3:23 PM	Formwork	2:40 hours	7:35 hours
Wed 4/12	7:12 AM	12:02 PM	Formwork	4:50 hours	
	12:46 PM	3:49 PM	Formwork	3:03 hours	7:53 hours
Thu 4/13	7:17 AM	12:19 PM	Texture/Seal	5:02 hours	
	12:50 PM	3:46 PM	Texture/Seal	2:56 hours	7:58 hours
Fri 4/14	7:13 AM	12:07 PM	Texture/Seal	4:54 hours	
	12:44 PM	3:39 PM	Texture/Seal	2:55 hours	7:49 hours

Frank Gomez
Signature Frank Gomez

Employee total 38:53 hours

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CIRCLE NO. 28

Dear Readers,

As 2006 progresses you'll notice some changes taking place in the pages of Concrete Décor magazine, including some general improvements to the magazine's layout and design. But one of the first changes that I feel is worth bringing to your attention involves our Contractor Profile, now called Concrete Décor's "Artisan in Concrete."

This new title has been established to better distinguish those individuals and construction companies that we believe demonstrate a level of quality and professionalism our readership will most appreciate learning about.

To honor each of these contractors, we have developed a new section online at concretedecor.net. Here you will find photos and company information for our "Artisans in Concrete" along with links to the articles we've published about them. Additionally, each contractor featured in Concrete Décor will be granted the exclusive use of Concrete Décor's "Artisan in Concrete" shingle, which can be used on his or her Web site or on other business materials such as brochures, stationary, or business cards.

For those of you who would like to have the opportunity to be one of Concrete Décor's Artisans in Concrete, we invite you to enter your name, e-mail address and Web site address at http://www.concretedecor.net/html/artisans-in-concrete.cfm. Here you can also download Concrete Décor's "Excellence in Concrete" banner, which will link your Web site to Concrete Decor, the most trusted source of information on decorative concrete.

Concrete Décor's contractor profiles are valuable for a number of reasons. We learn important details about what makes these individuals successful while gaining a stronger sense of what quality workmanship is all about. Constantly pressing to meet or exceed these expectations, in my opinion, is the main ingredient to keeping the demand for decorative concrete strong.

Concrete Décor invites every one of our readers to apply for this special opportunity in the pages of Concrete Décor. Whether we come knocking on your door tomorrow or five years from now, customers and colleagues who see either of Concrete Décor's distinguished banners on your Web site will know you are a company that strives for outstanding workmanship every day.

Sincerely,

Bent Mikkelsen, *Publisher*

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The Journal of Decorative Concrete

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www.concretedecor.net

ON THE COVER: A crew from Lakeland Co., based in Rathdrum, Idaho, uses shotcrete to create a rockscape. See page 22 for more on shotcrete.

Concrete Decor
The Journal of Decorative Concrete

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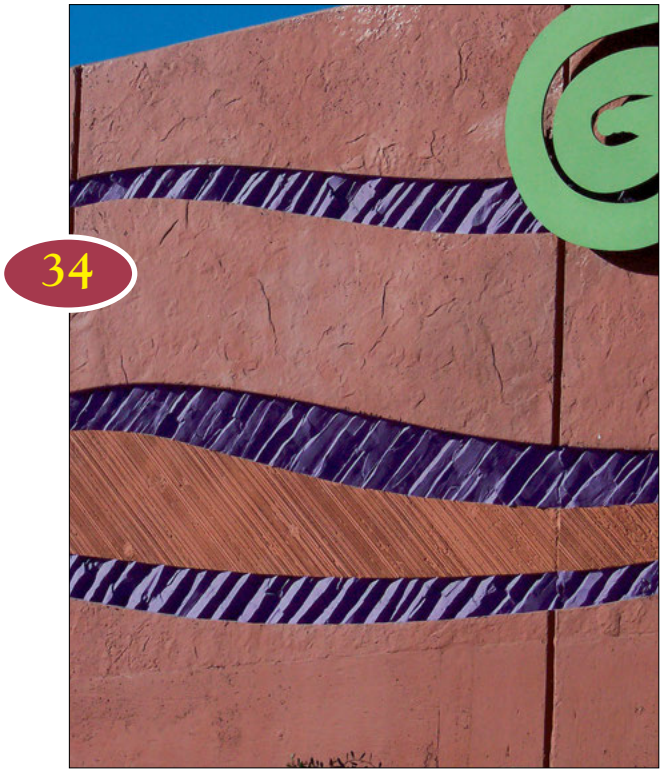

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CIRCLE NO. 08

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Consider This

"Too much water is just the devil for decorative concrete. That's a common theme we get in most of our complaint calls."

–Nick Paris of Davis Colors.

To look deeper into concrete mixes, see our story about integral color and admixtures on page 31.

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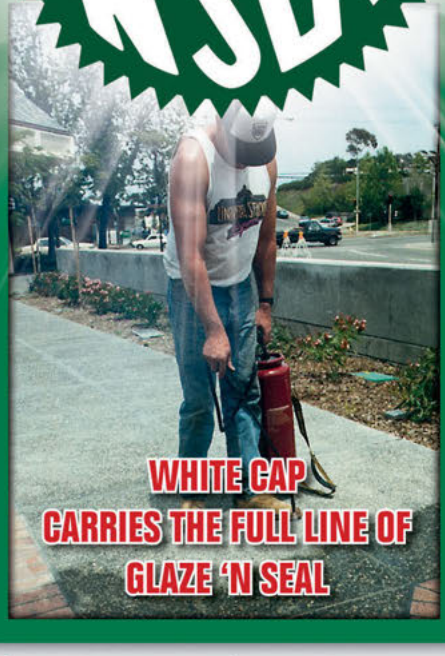

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CIRCLE NO. 71

Letter to the Editor

Eliminate white specks in your colored concrete

Everyone knows you should use white cement to bring out brilliant colors in your concrete projects (see Concrete Décor's Feb./March issue). What isn't so widely known is how to prevent white specks from appearing in some of those deeper colors. For example, you're creating a dark blue countertop and you use white cement and white sand to bring out the blue. After you acid wash the surface, you notice white shiny specks. The crystals in the white sand are showing through and reflecting the light. To prevent these white specks in the solid colored surface, use black marble dust instead of white sand. The black marble dust will tone down the pigment somewhat, but it will also eliminate those white specks.

Lee Dawson
Concrete Chemicals of California
www.liquiblack.com

Got something to add?
Be part of Concrete Decor!
Send your letters via e-mail to:
editor@concretedecor.net
Subj: Letters to the Editor

Correction

In the previous issue of Concrete Décor, an announcement of the winners of a design contest at the 2006 World of Concrete incorrectly identified the name of a division of Cheng Design Products. The division is called Cheng Concrete Exchange.

Industry News

Interstar to manufacture, distribute Cheng products

Cheng Design Products has announced the formation of a manufacturing and distribution partnership with Interstar Corp. Interstar, a manufacturer of pigments, admixtures, fibers and other products for the concrete industry, will manufacture and distribute Fu-Tung Cheng's proprietary line of concrete countertop mix products. Currently, these products are exclusively sold online at Cheng Concrete Exchange (www.concreteexchange.com).

Interstar, based in Quebec, Canada, has been lauded for its innovative products and outstanding customer service in the U.S., Canada and Mexico. Interstar manufactures and distributes a range of concrete products in North America, and the company was recently awarded "Exporter of the Year" by the Canadian government in the Research & Development category. The company's extensive distribution network will make the Cheng Design line of concrete countertop mix products available through construction product suppliers and home improvement retailers. The list of dealers distributing the Cheng concrete countertop mix products will be available on Interstar's Web site at www.interstar.ca.

For information on Cheng Design Products, please call (510) 849-3272 or visit www.chengdesign.com or www.concreteexchange.com.

Quest includes Klips in estimating software

Quest Solutions Inc. has announced two pieces of good news.

First, the company has partnered with Kodi

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CIRCLE NO. 19

PRODUCTS • TRAINING • SUPPORT

Klip Corp. to promote that company's concrete reinforcing technology. Quest has added Kodi Klips to their commercial, residential and training estimating databases as individual cost items that can be used as components of assemblies. The Kodi Klip was designed to eliminate twisting, cutting, and getting cut up when connecting rebar. With a simple place, push and snap, parallel or crossed bars are firmly held in place.

Second, attendees of World of Concrete 2006 have selected Quest Estimator as their favorite product in the Technology for Construction product category. The voting was part of Hanley Wood's Most Innovative Products contest, which is sponsored by Concrete & Masonry Construction Products magazine and runs concurrently with the World of Concrete.

For more information about Quest Solutions, visit www.questsolutions.com or call (800) 452-2342.

New owner for Degussa Admixtures

Degussa AG, Dusseldorf, is selling its Construction Chemicals unit to BASF Aktiengesellschaft, Ludwigshafen, billed as the world's largest chemical company. The acquisition includes Degussa Admixtures Inc., a business unit of the Construction Chemicals division. Degussa Admixtures makes chemicals for the concrete industry.

The transaction is subject to customary approvals, such as clearance from regulatory authorities, but it is expected to be closed by mid-2006.

"Degussa's construction chemicals unit has an excellent position in the industry and offers BASF an attractive means of forward integration in its existing value chain in construction chemicals," said BASF board member Dr. Andreas Kreimeyer in a news release. "The acquisition allows us to tap into the growth potential of the construction chemicals market on a sustainable basis and will further expand our position in this high-yield industry."

More information can be found at www.degussa.com and www.basf.com.

Propex builds strength with acquisition

Propex Fabrics Inc. has acquired SI Concrete Systems and SI Geosolutions. Ed Stanczak remains CEO and President of Propex, but the company's headquarters will be relocated to northern Atlanta.

Propex Fabrics Inc. (the former Amoco Fabrics & Fibers Co.) is a leading manufacturer of polypropylene fabrics and fibers for concrete, carpet backing, geosynthetics and a variety of other industrial end uses. It operates 13 manufacturing plants and offices

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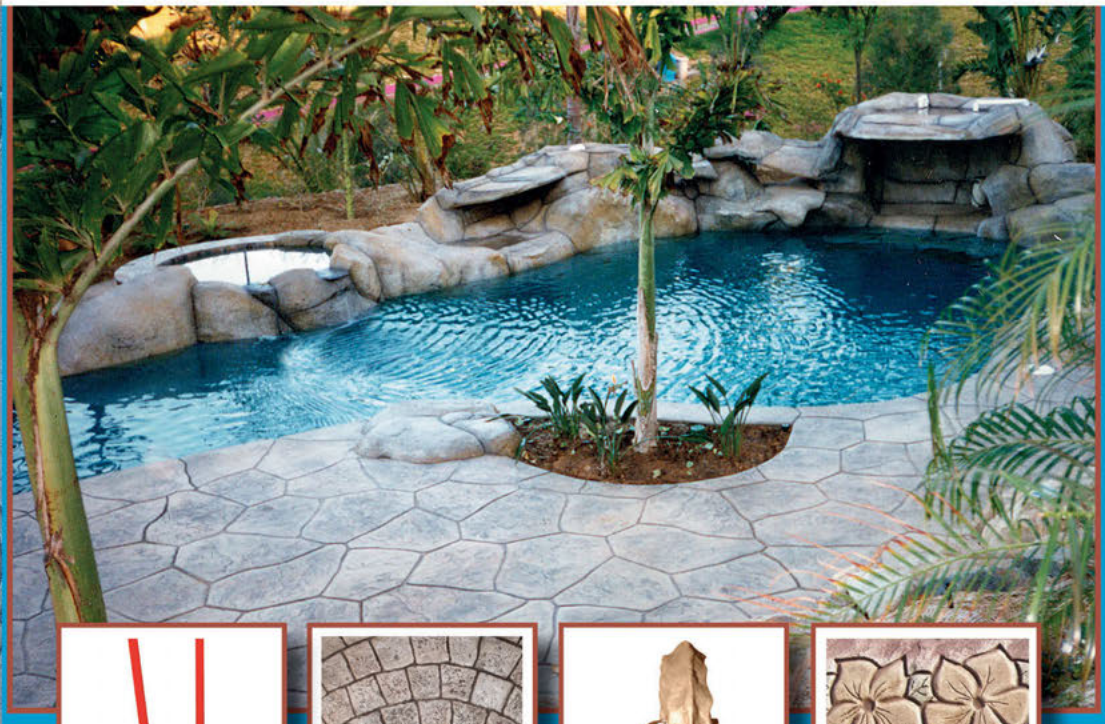

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CIRCLE NO. 56

worldwide. With SI Concrete Systems, Propex has acquired the world leader in concrete secondary reinforcement, with more than 25 billion square feet of fiber reinforced concrete placed around the world.

For more about Propex Fabrics, please visit www.propexfabrics.com.

Surf's up at Lafarge

Lafarge North America Inc. has redesigned its Web site to be faster and more customer-focused.

Users can now find expanded product information and literature on all of Lafarge North America's product lines, plus a wide range of product case studies and expanded multilingual content. The site also includes a new safety section and a redesign of the community and environment content, including numerous community and environment case studies as well as information on Lafarge's Recycling and Reuse program.

The site can be found at www.lafarge-na.com and www.lafargenorthamerica.com.

Cemstone offers LEED assistance

Cemstone has announced that John D. Lee, P.E., Engineered Sales Representative, is now a Leadership in Energy and Environmental Design (LEED) Accredited Professional.

The LEED Green Building Rating System is the national rating system for the design, construction and maintenance of sustainable, high-performance buildings. The LEED rating system was developed by the U.S. Green Building Council.

As a LEED Accredited Professional, Lee is accredited to assist Cemstone customers on the wide range of requirements needed for their projects to achieve a LEED Green Building Certification. He is able to provide a complete framework for assessing building performance and the implementation of strategies for sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality related to the use of ready-mixed concrete and concrete related products.

To learn more about Cemstone, visit www.cemstone.com or call (800) 236-7866.

A Robin Blue canoe

Canoeing down the river in your new concrete canoe! What? You read it right.

Every year, the American Society of Civil Engineering sponsors a nationwide Concrete Canoe

Competition. Rowen University, Glassboro, N.J., has competed for the last six years and made it to the nationals four consecutive times. This year, Concrete Chemicals of California is rooting for Rowen too — because Rowen's canoe will be colored with Concrete Chemicals' Robin Blue colorant. The students used about 120 pounds of Type 1A grey cement, plus another 75 pounds of slag and fly ash and some Robin Blue colorant.

Concrete Chemicals of California, www.liquiblack.com, a producer of liquid pigments for concrete, swimming pool plaster, and other cement products, usually sells colors for the cement around the water, not the object in the water.

Float your boat

Oklahoma State University (OSU) has been selected to host the 2006 American Society of Civil Engineers (ASCE) National Concrete Canoe Competition. More than 400 engineering students from across the nation will travel to Stillwater, Okla., for the 19th annual contest, often referred to as the "America's Cup of Civil Engineering."

Qualifying teams from more than 20 universities will race their canoes on Stillwater's Boomer Lake June 15-17. The competition is sponsored by Degussa Admixtures Inc., with additional support from Baker Concrete Construction, CEMEX, Pennoni, Penetron, Bentley Systems Incorporated, U.S. Silica Co., Propex Concrete Systems and 3M Specialty Materials Division.

The canoes will be judged in four main categories: aesthetics and adherence to design parameters, a technical paper, a business presentation, and races. No ordinary chunks of sidewalk, successful entries in the contest are maneuverable, lightweight and sturdy. While they are "concrete" in the sense that an aggregate and a cementing agent were used, most crafts are constructed from high-tech aggregates and

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CIRCLE NO. 06

The 2nd Annual Northern Ohio Decorative Concrete Forum & Competition, First Place Winners.

admixtures, including latex, superplasticizers and fly ash. They must carry as many as four paddlers and, as part of a swamp test, rise to the surface after being completely submerged. Participation in the contest involves thousands of hours working on research, design and construction, and the student teams must detail in reports and presentations all technical and economic aspects of their projects. Many teams spend an entire academic year working on their craft, most without academic credit.

For more information about the concrete canoe competition, visit www.acse.org or contact Joan Buhrman, ASCE, at (703) 295-6406.

And the winners are …

The 2nd Annual Northern Ohio Decorative Concrete Forum & Competition, sponsored by the Chas. E. Phipps Co., was held in February at the Cuyahoga County Fairgrounds in Berea, Ohio. In total, 10 competitors vied for not only $2,800 in cash prizes, but also the opportunity to display their craftsmanship in the use of decorative concrete.

Creative Concrete of Ravenna, Ohio, was the overall winner, with the Northern Ohio

The 2nd Annual Northern Ohio Decorative Concrete Forum & Competition, Second Place Winner.

Administrative District Council Regional Training Center of Bricklayers & Allied Craftworkers coming in second and Cutting Edge Construction of Richfield, Ohio, taking third place.

Judges included Cindy Grahl of Builders Exchange Magazine, Ryan Grass and Melina Kaczor, architects, and Aimee Pergalsky of the Northern Ohio Concrete Promotion Council.

To see more photos of the creative work done at this contest, both finished and in progress, visit www.concretecompetition.com. **CD**

The 2nd Annual Northern Ohio Decorative Concrete Forum & Competition, Second Place Winner.

Association News

Portland Cement Association

Awards honor outstanding effort

Portland Cement Association (PCA) awarded seven industry professionals with Promotion Progress Awards at its annual spring committee meeting in March. The winners were selected from 16 nominees, all PCA member company personnel, for outstanding effort in promoting cement and concrete products.

The members receiving the honor are:

- Ron DeLeenheer, Ash Grove Cement Co., for his leadership in creating a powerful promotional liaison between PCA and the Regional Promotional Group programs.
- Bob Helinski, Lafarge North America, for his crucial role in the development of both U.S. and Canadian cement specifications, including a recent change to ASTM C-150 to permit the use of up to 5 percent limestone in portland cement.
- Al Innis, Holcim (US) Inc., for his work in the creation of PCA state transportation department communications teams to inform local DOTs of upcoming standard changes regarding limestone in cement and the benefits of these changes.
- Bill Larson, CEMEX, for forming the first Sustainable Development and Construction Workshop to discuss key issues affecting the use of cement and concrete in Southern California.
- Frank Lennox, Buzzi Unicem, for countless hours spent influencing the use of RCC, pervious concrete and full-depth reclamation using cement in the Southeast.
- Barrett Reese, TXI, for dedicated efforts to promote concrete in all aspects of construction, including residential, architectural and pavement work.
- Cathy Sauerwine, Lehigh Cement Co., for her work in promoting the use of white cement in infrastructure applications to improve aesthetics and enhance roadway safety.

The 2005 Promotion Progress Awards are co-sponsored by PCA and the Cement Association of Canada. More information on individual award winners is available at www.cement.org/pca.

American Society of Concrete Contractors

Guide details concrete's imperfections

The ASCC has published "Guide for Surface Finish of Slabs on Ground," a publication written by Ross Martin and edited by ASCC's Education and Training Committee.

The spiral-bound 21-page Guide was designed to help contractors inform owners, specifiers, architects and engineers of the surface finishes of slabs on ground, or grade, that they can provide. The publication covers variations in concrete color and texture and discusses imperfections such as trowel marks, pinholes, delamination and cracks. The full-color book includes numerous photographs of imperfections.

For more information, visit www.ascconline.org or call (866) 788-2722.

Regional Associations

News from Chicagoland

The Concrete Contractors Association of Greater Chicago has installed George Daker III of Daker Corp., Burr Ridge, as vice president. Taking his place on the CCAGC board is Norbert Sobczyk of the North-West Builders Association, Niles.

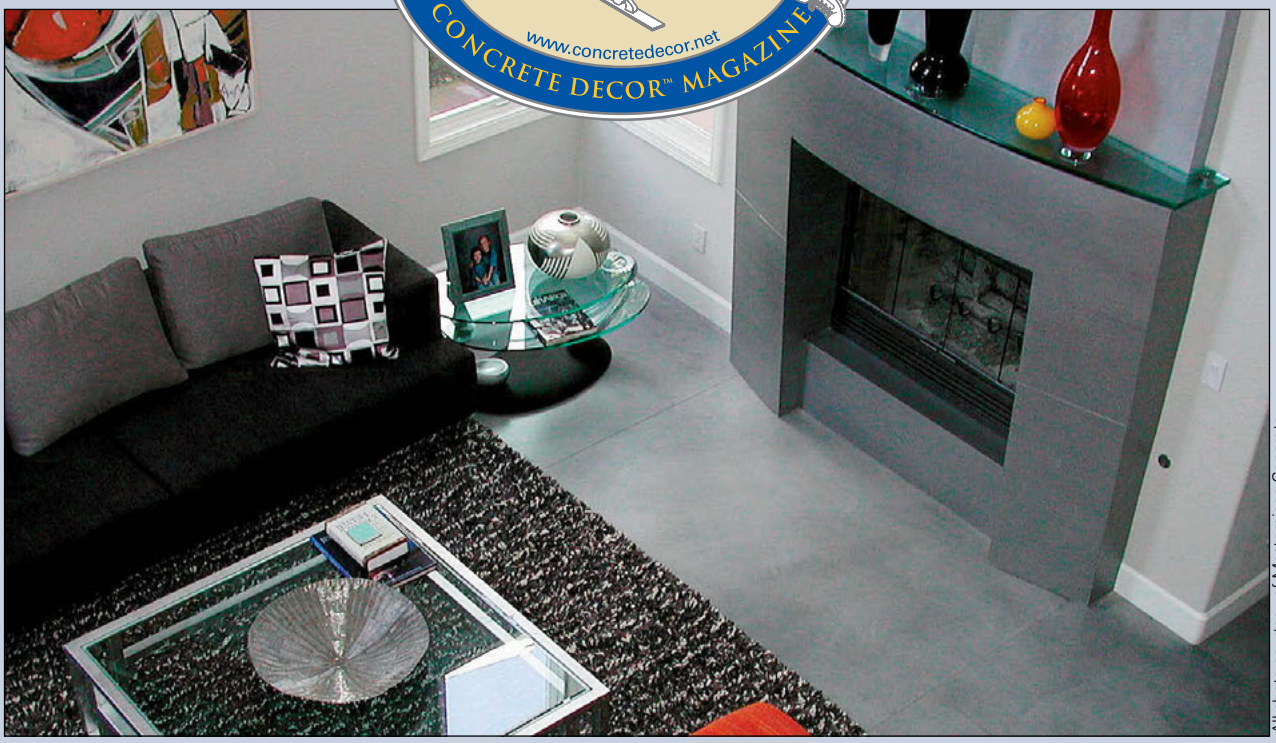
For information on the CCAGC, contact Bob Morreale at (630) 990-4222.

Fritz honored by Minnesota ARM

Jason Fritz, a Cemstone sales representative, has been named 2005 Promoter of the Year by the Aggregate & Ready Mix Association of Minnesota (ARM).

A Cemstone rep for nine years, Fritz specializes in Insulating Concrete Forms (ICF) technology, which is used to build above-grade concrete walls for residential and commercial buildings. Fritz twice served as the co-chairman of the ARM's ICF Committee and is active on several subcommittees, including Education, Finance and Promotion. Fritz also established the ARM's ICF course to help educate and promote the benefits of this technology to architects, engineers and developers.

To learn more about Cemstone, visit www.cemstone.com or call (800) 236-7866.



All photo courtesy of Masterpiece Concrete

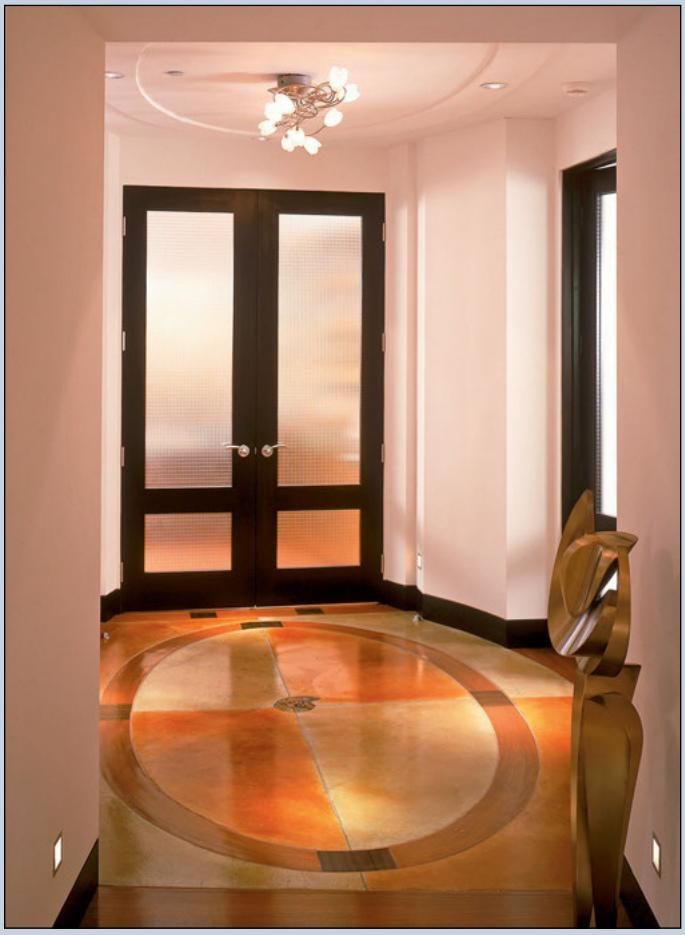
Masterpiece Concrete Compositions Inc.

by Christina Camara

Oceanside, California

It's always nice to find a company that offers the vision of a fine artist, the know-how of a chemist, and the entrepreneurial drive of an inventor. And in the talented team of Bernie Apodaca and Debra O'Leary of Masterpiece Concrete Compositions, you'll find all these characteristics and more.

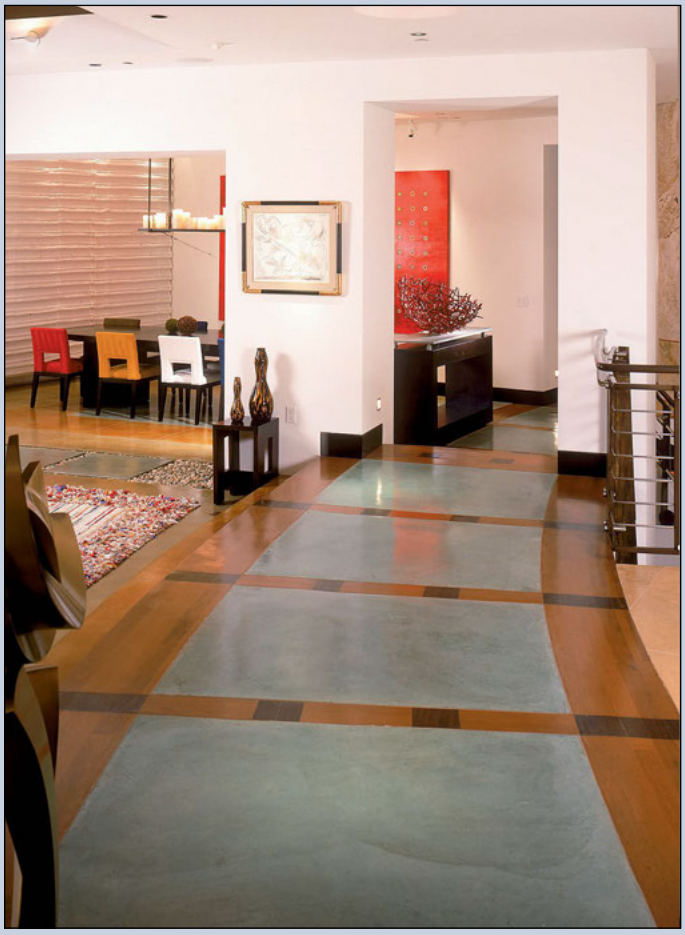
To date, Masterpiece Concrete Compositions has installed over 1 million square feet of both interior and exterior decorative concrete on projects as big as 420,000 square feet and as small as 500 square feet. These include city sidewalks, amusement parks, churches, museums, schools, shopping malls and retail stores, as well as hospitals, hotels, parks, restaurants and private residences. Some well-known completed projects are Showplace, in High Point, N.C., Spirit of Christ Church in Denver and The Wild Animal Park in Escondido, Calif. In San Diego, Masterpiece Concrete has completed projects at The San Diego Zoo, Sea World, PETCO Park, The Hyatt Hotels, and St. Gregory's Catholic Church.



Apodaca and O'Leary saw the potential in decorative concrete more than 12 years ago, long before it became wildly popular. The two met while she was working as a project developer for a concrete company; he was an artist with his own graphic design business. A series of events eventually led to a partnership that combined O'Leary's vision for architectural concrete with Apodaca's artistic abilities. "I folded up my business that I had for 14 years," Apodaca says. "I fell in love with concrete and we married our talents together."

In its infancy, decorative concrete included little more than integral colors or 12-inch-by 12-inch stamped concrete tile patterns. Motivated by a love for concrete and dissatisfied with the industry's limited options, Apodaca and O'Leary focused their energy on creating new systems and methods using concrete stains, toppings and graphics, all of which could be incorporated on existing concrete as well as other surfaces. The goal was to produce a concrete color finish that looked natural and organic. "If it looks man-made, it's not good enough," Apodaca says.

O'Leary also felt limited by the available choices for reactive stain colors. Through experimentation using polymers and a variety of techniques, the two created their own microtopping system that seamlessly blended design with color. For example, back in 1997, one of their San Diego clients wanted to accent their restaurant floor with an additional, yet nonexistent, "eggplant" color in order to complement the reactive stain colors of ochre and patina green, popular color choices at the time. Using their proprietary microtopping system, they were able to incorporate the desired color and design choices and create a concrete floor complete with the desired "eggplant" color as well as a graphic of a guitar with realistic-looking steel strings.



As doors continued to open, the business evolved into Masterpiece Concrete Compositions, a company now in its eighth year. Apodaca and O'Leary have continued to strive for new and innovative ideas to satisfy their clients' demands for greater artistic creativity in concrete by offering concrete systems and solutions that are not only beautiful but have great durability. "We aren't married to one type of brand," Apodaca says. "We come up with a combination of systems to satisfy the needs of the client and the budget."

Projects include interior and exterior installations of concrete stain systems, topping systems and graphics on walls, floors, countertops and tub and shower surrounds. Known in the industry for its expertise in problem solving, Masterpiece is accustomed to helping local distributors and manufacturers who refer clients that need solutions for concrete problems. "There is an 'underlying monster' in concrete," Apodaca says. "The right products have to be used on the right surfaces. If not properly diagnosed, projects can fail. Part of the expertise is understanding and knowing the chemistry and science behind it."

As they look to the future, Apodaca and O'Leary see that in order for architectural concrete to offer true solutions it must become more creative, more durable, physically stretchable and flexible. Transparent concrete anyone?

They also stress that architectural concrete should be valued for its unique look — and that all decorative concrete work should be held to the highest standards. Along with that, contractors should not be afraid to charge what the work is really worth. "They need to charge for the value of creating and installing a handcrafted product," O'Leary says. "They need to raise the bar."

"Anyone can buy paint," Apodaca adds, "but who can paint the Mona Lisa? It's all about having vision and passion." **CD**

Get Creative with Shotcrete

by Susan Brimo-Cox

Is it rock, or is it concrete?

Rock-themed landscapes are showing up more and more in commercial and residential settings — and many of them look like the real thing.

But as most decorative concrete contractors know, many of the rocks that are seen in museums, theme parks, resorts, shopping malls, golf courses and even people's backyards are fake — or faux, as they're often called. They're made of concrete, and for good reasons: cost, weight, versatility and concerns about the environment are some that come to mind.

Of the many techniques used to create faux rocks from concrete, shotcrete is one of the best.

For big jobs, shotcrete solves a lot of potential problems, observes David Long, president of Lakeland Co. Inc., a firm with a wide variety of large-scale projects to its credit. "Shotcrete is the best option for work that requires a transition of different finishes into one application," he says, "or for areas where there is not access for equipment to hang rock panels or other prefabricated theme structures."

Photos Courtesy of Lakeland Co.

Photo Courtesy of Lakeland Co.

Long also notes shotcrete is good for areas that need to be stabilized before the finish work can be done, and when a budget doesn't have room for replica panels. And applying shotcrete allows you to cover a large surface area in a short amount of time.

Shotcrete is good for smaller projects, too. Michael Dahl, president of Michael Dahl Concrete Designs Inc., almost always uses shotcrete. "It goes on a lot faster and you get a stronger concrete because of minimal air pockets," he says.

Because of its quality and strength, Dahl especially likes using shotcrete on vertical surfaces. "Because of the lower water/cement ratio, it's really strong for retaining walls," he says.

Coming to terms with shotcrete

Shotcrete is pneumatically applied concrete or mortar. The term "shotcrete" was originally used as a substitute for the proprietary word "Gunite," and can refer to both the wet-mix and dry-mix process. For our discussion, shotcrete will mean the wet-mix process. Gunite refers only to the dry-mix process.

With shotcrete, the wet concrete mix is pumped through a hose to a nozzle, at which point high-pressure air is introduced to shoot the concrete onto the receiving surface.

With Gunite, high-pressure air is used to blow a dry cement mix through a hose to the nozzle, where water is injected into the mix immediately prior to application.

Each process has pros and cons.

One of the major advantages of wet-process shotcrete is that you do not have to hand-mix the material on site. This aspect of the job can be outsourced and the material brought to the site in ready-mix trucks. However, if you go this route, you have a certain window within which you must apply the shotcrete. Depending on the size of your crew, this may also limit the amount of time available for carving and detailing your faux rocks.

If you use Gunite, careful application is critical to ensure that the dry cement mix and the water combine successfully on the receiving surface. As a safety factor, it is important to remember the psi of the compressed air required for Gunite is much greater than that required by shotcrete. This also results in greater overspray and rebound. On the other hand, because Gunite is a dry mix, you can apply it in sections, set the equipment aside and take more time to carve the rockwork.

Pumping concerns

Depending on the scale of the project, you may have varied needs with regard to pumping equipment. Pumps come in portable, tow-behind sizes as well as large-scale behemoths.

If you need to pump shotcrete great distances, hydraulic swing tube piston pumps might fit your bill. "These pumps can be engineered so that they are capable of pumping wet shotcrete mixes extreme distances due to the amount of piston face pressure (up to 2,200 psi)," explains Tripp Farrell, sales manager of Blastcrete Equipment Co. Volume in these pumps can range from 3 cubic yards per hour up to 50 cubic yards per hour, he adds. An important characteristic of hydraulic swing tube pumps is that they will reverse, he says, "which is extremely important when

pumping low-slump mixes."

Ball seat pumps are another option and can be used quite successfully. But because these machines are not designed to reverse, they can be dangerous if a plug occurs. If there is a plug, the discharge line or a valve on the machine must be opened to release the line pressure.

Peristaltic pumps — also called hydraulic squeeze pumps — use rollers against flexible tubing to create pressurized flow through the pumping tube. Farrell notes these kinds of pumps have forward and reverse capabilities, and they are easy to maintain.

"Most contractors prefer to have a mixer/pump combination unit," Farrell observes. This gives contractors the option to mix, pump and spray material for smaller jobs, and for large jobs to bypass the mixer, instead of having the ready mix delivery of shotcrete dispensed directly into the receiving hopper.

Equipment prices vary and some equipment can be very costly. Equipment may also be rented, but may not be cost effective if you do a lot of this type of work.

Stan Pace, president of FossilCrete Inc., advises that contractors buy equipment appropriately sized for the scale of their usual projects. But he cautions also to keep in mind the size of the air compressor support you'll need to accommodate the pump, and the design of the mix you'll expect the pump to handle.

But even if you do mostly large-scale work, Pace says having a smaller pump in your equipment line up may be a good idea because it will allow you to work with a smaller amount of mix, which can be used for detailing and texturing after the structure coat is applied.

Doctoring the mix

The shotcrete mix used in any given application will vary pending the requirements of the project application, and then some.

"Knowing which aggregates are provided from the concrete company would determine the mix ratio for the shotcrete being applied," Long explains. "For example, some concrete providers have round 3/8-inch aggregate and others might carry crushed 3/8-inch shale, depending on the part of the country where your project is located."

Other factors include whether your location is flat, vertical, sloped or inverted; the distance from the pump to job location; the weather at the time of application; and the concrete truck time spacing. The slump of the concrete needed to accomplish the required project application will be determined by the location and the design, Long adds.

Contractors use a variety of admixtures in shotcrete to make it work better. Different products help with flowability, plasticity and workability. But sometimes designing the mix is a calculation aimed at a fine line between a mix that is too dry or too soupy. Some contractors have turned to using a mix water conditioner.

Photo Courtesy of Blastcrete Equipment Co.

David Johnson, president of Applied Concrete Technology Inc., explains that a mix water conditioner is not an admixture. "The water is conditioned before it hits the portland cement," he says. The product conditions the water to make it more efficient, causing it to bind with more particles. Some people liken the process to making the water wetter, but Johnson describes it as getting tighter into the concrete. This process is reported to also make the concrete stronger, more durable and less permeable.

The use of fiber reinforcement in shotcrete for faux rocks appears to be a personal choice. Some feel it adds strength. Others don't. Some say the fibers can look like fuzz on the surface if they are disturbed during the detailing stage. Other contractors don't seem to have this problem.

Photo Courtesy of Michael Dahl

Making faux rocks

The method of creating faux rocks with shotcrete boils down to three steps, says Pace: frame, structure and texture.

The general shape and strength of the frame depends on the requirements of the finished rock structure. Sometimes the rock is designed for visual aesthetics only; other times the rock may be functional, such as forming stairs or a sitting ledge or functioning as a retaining wall. Typically,

Photo Courtesy of Michael Dahl

the shotcrete is applied to an appropriate framework of reinforcing bars covered by metal lathe.

The structure itself is created by applying the shotcrete to an adequate depth, and just about everyone will tell you the most important guy on the crew is the nozzle man.

"The hardest thing is placing the concrete," Dahl says. "If you place it correctly the first time you don't have a lot of extra work." Having a nozzle man who has honed the techniques needed to do it right the first time is extremely valuable — especially when you are applying shotcrete on vertical surfaces.

The detailing and texturing may be part of step two or a separate step, depending on whether you apply a texture coat or directly carve a single application of shotcrete.

Pace recommends a separate texture coat. "You know your structure coat is strong enough, so when you apply a texture coat you are totally free

Design tips: Getting it right

There are a number of principles that come into play when designing a landscape, including proportion, unity, balance and rhythm. These principles should also be considered when incorporating faux rock into a landscape setting. Here are some tips that might help you succeed:

- Will the rocks be a backdrop or a focal point of the landscape? The rocks you create should follow the function of the design.
- Make sure the rock structure is in proportion to the setting and the plant material that will be used. And think ahead: As the plants mature, will the rock structure continue to look realistic?
- If possible, go out and study how real rocks actually appear in nature. Use natural rocks as your inspiration.
- Use rocks of one geologic type. You don't have to stick with what occurs naturally in the area, but a mishmash of rock types in one landscape usually does not look natural.
- Honor the true characteristics of the rock type you are recreating. Size, shape and mass are all important characteristics to consider. Most rocks do not look like turtle shells.
- Do not evenly space boulders in the landscape design. Rocks in nature are irregularly spaced, grouped or layered. When grouped, odd number groupings seem to have more visual and aesthetic appeal.
- Rocks look unnatural if they appear to be sitting on top of the ground. Instead, design your rocks so it appears that at least one quarter of the rock is underground.
- The rocks should appear as though they are positioned consistently by nature. For example: If your rocks show lines of stratification, these lines must be at a consistent angle throughout, unless a piece is supposed to represent a section that broke away. Similarly, chinks, crevices and uplifted areas should be accurately represented.
- Pay attention to texture. For example: Lava rock has a different texture than granite and outcroppings might be more jagged, while rocks in watercourses and waterfalls should be smoother.
- Sometimes it works well to incorporate some real stone with the faux rock.

to carve or stamp what you need in the texture coat." So, for example, you could carve a crevice as deeply as you want in the texture coat without compromising the structure.

Texturing the original application of shotcrete is also an option, but you have to work quickly while being careful not to compromise the structure. You can't begin carving and detailing too soon or the shotcrete will fall off, but the shotcrete can't be too far along in setting up or you won't be able to get the detail.

As Long explains, the texturing and detailing is where you need to be an artist. Carving and applying brush or stamped textures are all learned skills that take practice. Dahl uses trowels to sculpt the shotcrete and then uses custom-made texture mats.

Then there is the coloring. "We use a combination of acid stains and other techniques, such as acrylic washes and oxide washes, to achieve the effect we want," Long says. Dahl likes to use acid stains. "They are earth-tone colors that suit natural-looking rocks. I'll tint my sealer, too, to adjust or achieve a more true, pinpointed color," he says.

Often, the viewing distance will impact the amount of detail required — as will the budget. If the faux rock is a backdrop to be viewed at a distance, the amount of detail doesn't have to be so precise. The look desired may be accomplished by shape and general color, whereas if the faux rock will be close enough to touch, the texture and coloring must be as realistic as possible. That's why really detailed work can cost $100 per square foot to $200 per square foot or more.

As for sealers, some prefer solvent-based sealers because they are more cost effective and others like water-based sealers because they are more environmentally friendly. Long recommends using a penetrating sealer for its protective qualities.

Reapplication of a sealer is not usually an issue. Long says most of his clients appreciate the weathered look that time and the elements produce.

Looking better with age

"Faux rocks allow you to accomplish what you couldn't ever do with real stone," Pace points out.

Dahl agrees. "The thing about making custom rocks is you can create the rock you need. You can problem-solve where a real rock is not practical or available," he says.

But be careful not to oversell, cautions Long. And be sure to let the client know that the project will mature and look better with age. A recreation of a natural scenario never looks its best immediately when finished. But look at one a few years later, when the landscaping plants mature and fill in, and it looks like the real thing.

"The whole goal," Long says, "is to help your client envision what you're creating for their environment." **CD**

A Concrete Makeover for Wood Surfaces

Tips for applying a cementitious topping over wood.

by David Thompson

Polymer-modified cementitious overlays are well known for their ability to put new faces on old concrete slabs. Less known is that many of these same products can put brand new concrete faces on wood surfaces, both old and new. Overlays can be used to create concrete surfaces that run up wood walls, down wood stairs, over wood countertops, and — more often then not — across wood floors or decks.

Whatever the substructure is, it has to be well constructed to successfully support a cementitious overlay. Wood, with its constant swelling, shrinking, shifting and settling, is already a moving target as far as a cementitious topping is concerned. Flimsy construction or loose floorboards won't do, since an overlay is only as strong as its base. For outdoor decks — one of the most popular areas for cementitious overlays — this means plywood should be at least 3/4 inch with joists spaced every 16 inches. The preference is for tongue-and-groove joints with the plywood securely glued and screwed into place. At the very least, joists should be blocked where plywood seams meet.

Cementitious overlays can run from feather thin to several inches thick. In cases where the overlay will exceed 1/2 inch, contractors should consult with a framer to ensure the structure can handle the weight, according to Gordon Pennington, president of Renew-Crete, a manufacturer of overlayment materials that are often used over wood. "You may have to add extra joists to support the overlay material," he says. "Usually that's not the case as long as it's not more than a half-inch thick."

Not all cementitious toppings on the market are recommended for wood. Toppings that are too brittle, particularly some self-levelers, will fail. If the manufacturer hasn't specified that a topping is designed for use over wood, that's a pretty good indication that the product may crack like an egg if you try it.

Even the most flexible toppings, though, aren't designed for direct application over wood. "I don't know of any manufacturer who would recommend using any kind of polymer cement overlay directly over wood," says Gwynn Stegen, chief operations officer for Excellent Coatings. "If you do that, all bets are off and the product might very well fail."

What the heck do you do, then?

"Take the wood out of the equation entirely," Stegen says.

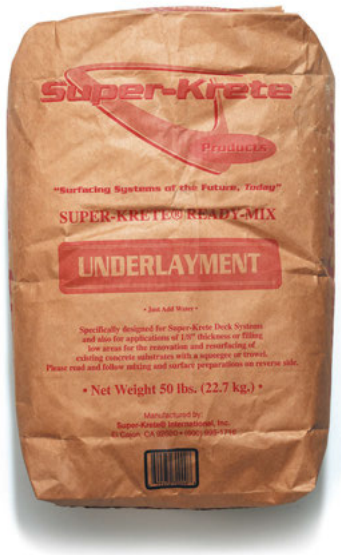


Photo Courtesy of Super-Krete



Photos Courtesy of Diamond D Co.

Dave Pettigrew of Diamond D Co. used decorative overlays to give new life to the Prophet Elias Greek Orthodox Church in Santa Cruz, Calif. The original floor consisted of linoleum over plywood. Pettigrew put down a 1/2-inch thick overlay, which was then sawcut and stained with five colors.

Floating layer absorbs movement

This is done by creating a floating layer between the wood substrate and the overlay. The layer absorbs the movement of the wood to protect the overlayment from cracking. There are two approaches to creating this shock-absorbing sublayer. One borrows from the time-honored technique of stucco, using expanded metal lath. The other approach borrows the backerboard, or greenboard, used by tile setters.

In systems that use lath, the grain of the lath should run perpendicular to the grain of the plywood. The sheets of lath should overlap 2 inches at the seams, which should be offset from the seams of the plywood. The edges of the lath should be set 1/2 inch back from the edge of the floor or wall so the overlayment material can be feathered in.

Lath-based systems involve an underlayment that's typically troweled or sprayed onto the lath to create a good bondable surface for the finish coat. Some products are designed to go on just thick enough to fill the voids in the lath. Others can be built up several inches. Thicker can be useful if, say, the framers screwed up and didn't build slope into a deck to begin with.

Some manufacturers' wood-overlayment systems include a layer of fiberglass mesh. Flex-C-Ment's lath-based system, for instance, features 38-inch rolls of fiberglass mesh, which create a mesh layer that further dampens movement of the wood subfloor. "It creates a sandwich effect," says Andy Yoder, president of Flex-C-Ment. "You've got metal lath on the bottom, fiberglass on top, and cementitious underlayment in the center."

Moisture barriers

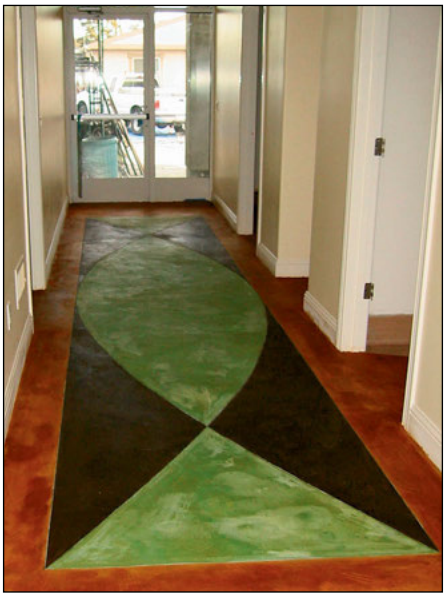
Whenever lath-based floor systems are used outdoors, and sometimes when they're used indoors, a moisture barrier is a typical ingredient in the sandwich sitting between the wood and the cementitious overlayment. The moisture barrier serves the dual purpose of stopping moisture from rising and messing with the bond of the topping while at the same time preventing moisture from above from reaching the wood below.

Moisture barriers can range from simple tarpaper laid beneath the lath (and sometimes attached to the lath, as it is for stucco work) to the moisture barrier in the Flex-C-Ment system, which has self-adhesive on one side and a fabric surface on the other. In the Flex-C-Ment system, the moisture barrier sits on top of the sandwich like a sheet of Glad Wrap, with the final coat applied on top of it.

Specialty coatings manufacturer Life Deck has two systems for putting cementitious overlays on decks, one involving a total of five layers and the other with seven. Both involve moisture barriers, but the seven-layer system offers the most extensive waterproofing. Some Life Deck clients, hedging their bets against leaky plumbing and other watery problems, prefer to use extensive waterproofing even indoors, says Whitney Lawrence, marketing manager for Life Deck.

Super-Krete's system does away with the moisture barrier altogether, since Super-Krete is itself waterproof. "Other systems require a water barrier," says John Holwitz Sr., Super-Krete's founder. "The only thing we require are vents if the bottom of the deck is boxed in." Without vents, trapped air will expand and bow the wood, possibly pushing the cementitious topping beyond its limits. Dry rot is another hazard. Holwitz recommends spacing vents no more than 10 feet apart.

Photo Courtesy of XXXXXX



An alternative to lath

Backerboard is the alternative to lath. It too creates a floating layer that absorbs the movement of the wood and protects the cementitious overlay from cracking. Super-Krete's Holwitz prefers backerboard to lath both for its structural qualities — "It gives you a solid, floating surface, rather than a stapled-down rigid surface" — and for the labor-savings gained when you don't spend time cutting and laying the lath: "It takes a while to staple down all that wire."

Screws fasten the backerboard to the plywood, and joints are either bridged with fiberglass-reinforced tape or — better yet — they are honored and incorporated into the design of the floor. If the joints are to be honored, many contractors will opt for 4-by-8 sheets of backerboard, rather than 5-by-8 sheets. With 4-by-8s, the cementitious overlay can easily be scored with a series of 4-foot squares.

With both lath-based and backerboard-based approaches, Joe Francis, general manager of Renew-Crete, advises contractors to put joints in all doorways and on all floors more than 10 feet across. "You should cut joints in doorways because all wood houses will get movement where the walls meet the floors," he says. "In larger rooms you want to score lines that break the floor into at least 10-foot sections, if not 4-foot sections, to provide relief from movement, similar to regular concrete."

Photo Courtesy of Tom Ralston

This overlay on a wood subfloor was created with Ardex Products, then colored with acid stains and dyes.

Decorative treatments

In addition to saw-cutting and scoring, decorative treatments of cementitious overlays on wood typically include integral coloring, acid staining, dyeing and stenciling. One thing worth noting about polymer-modified overlays is that they show less variegation than regular concrete when acid-stained. "They take colors more intensely," says Stegen of Excellent Coatings. "You get almost a solid color. So you have to experiment."

Mockups are indispensable. And trainings, which are widely available throughout the country, aren't a bad idea either. "There are a lot of good seminars and 'deminars' out there, and you'll get a lot of good points," says contractor Tom Ralston, of Tom Ralston Concrete in Santa Cruz, Calif. "But really the best teacher is experience, and the only way to get experience is to do mockups. Don't use your clients as guinea pigs."

Still, even contractors who have lots of successful overlays under their belts can sometimes run into trouble. It happened to contractor Dave Pettigrew of Diamond D Co. in Capitola, Calif., who recalls spider cracks opening up all over the second floor of an old wooden home that he had covered with a cementitious overlay. Fortunately for Pettigrew, the homeowners saw an aesthetically pleasing contrast between the cracks and the 4-foot grid cut into the floor.

"The people fell in love with it," Pettigrew says. "They were like, 'How did you do that?' Of course, all I could do was grin and say, 'Experience.'" **CD**

Photo Courtesy of Grace Construction

Mix Messages

How performance admixtures affect integral color.

by John Strieder

Water is the most harmless substance in the world. It won't stain clothes, car seats or upholstery. But it will play havoc with a batch of colored concrete.

When integrally colored concrete looks faded, H_2O is the prime suspect, says Nick Paris, vice president of marketing for Davis Colors. The more water in a mix, the less intense the tint, he says. "Too much water is just the devil for decorative concrete. That's a common theme we get in most of our complaint calls."

Less water per unit of cement means richer, deeper and darker color, agrees Chris Forgey, marketing manager with the residential segment of Grace Construction Products.

Most contractors know better than to pitch bucketfuls of water into a half-poured batch of concrete, and if they don't, they learn fast.

Using admixtures that change the water-to-cement ratio and other properties of concrete is, pardon the pun, more of a gray area.

Aside from an integral color admixture itself, only one type of admixture is going to have a significant effect — a calcium chloride accelerator, which can cause mottling. "In general, admixtures when used properly do not have an effect on the final color," Forgey says.

However, many admixtures are designed to change the water-to-cement ratio in a batch, and that effect can sometimes be noticed, if only faintly.

And you're going to get a chemical reaction as well, says Chris Sullivan, technical director for QC Construction Products. "The bottom line is no one knows all the reactions that happen when concrete gets hard. There's so much going on."

Most experts agree that there is really only one factor a contractor needs to think about when putting an admixture into integrally colored concrete, and that is consistency. "It's all about consistency," Sullivan says. "At the end of the day, stay away from calcium chloride and be consistent with everything else and you'll be fine."

Consistency is easier said than done. Even Sullivan acknowledges that a uniform pour of any significant size is the most difficult task to pull off in decorative concrete.

Even so, Sullivan ranks admixtures below water-to-cement ratio, cement color, the amount of cement, and the aggregate as a factor in the final color of an integrally colored slab. Even when an admixture is used to alter the amount of water needed in a mix, casual observers may have a hard time finding fault with

Photo Courtesy of Grace Construction

the results. "While there is a color effect, it's minimal," he says. "You really are going to have to look to notice a difference."

If a slab poured with varying amounts of admixture is blanketed with joint cuts, release agents, patterns and textures, the difference will be hard to make out. "If there are any inconsistencies in the color, you've kind of masked that," Forgey says. "Putting a border across a driveway breaks up what the eye sees."

Aside from how much a performance admixture will affect tint, the most important question is how. Let's take a closer look at five common types of additives.

Air entrainers

An air-entraining admixture makes concrete more porous to improve its durability in freezing temperatures. Because a rougher, more porous surface will scatter light rays, these additives may give untroweled colored concrete a faded, less intense appearance. "The more air you add, the lighter color you're going to get," Sullivan says.

On the other hand, air-entraining admixtures won't impact the shading itself, says Scott Thome, director of product services for L.M. Scofield Co. "The amount of additional water is low enough not to alter the water-to-cementitious-content ratio."

In fact, air-entraining mixtures can actually aid color development. By blocking bleed-water passageways, they force the water to linger inside the curing concrete. "The slower the water leaves the slab, the less impurities come to the surface," Thome says. "These impurities will have an effect on the final color."

A contractor who trowels with less bleed water will get a surface that is darker and richer in color, Paris notes. "If you didn't have an air-entraining agent and you troweled with less bleed water, then you would have the same effect."

Air-entrained concrete also gives workers something to sink their trowels into — a creamy, foamy topping that some say responds better than straight concrete. "They're basically creating suds on the surface," Paris says.

With the same coloring and the same troweling, a 6 percent air mix will present the same surface color as a zero percent mix, Sullivan says. Essentially, a surface of an air-entrained slab can look rich and bright even while its interior looks comparatively dull. "In colored concrete, there is a difference between what you see inside and what you see on the surface," he notes.

Plasticizers

A plasticizer reduces the amount of water needed to get a given consistency. The less water, the richer the tint, so at first, concrete mixed with plasticizer will give off a richer color. However, as it hydrates, it will lighten and basically assume its typical color, Sullivan says, and the end result is "no effect down the road."

However, Thome warns that using a plasticizer alongside an integral color admixture with water-reducing properties may overplasticize the mix. "Using a color admixture that contains a water reducer and then adding a high-range water reducer to increase the flow, you could develop a retarded mix," he says. "The set time could dramatically increase, which causes a delay in the finishing process. During the delay, if the surface starts to dry out but the mass is still plastic, surface cracking may occur."

He offers a solution: "By lowering the amount of the plasticizer to compensate for the water reducer in the coloring admixture, you will have a workable mix design."

Accelerators

Decorative concrete contractors must avoid calcium chloride accelerators, because the chemical destroys iron oxide pigment particles. Nonchloride accelerators, such as triethanolamine, are considered safe. But might they darken a slab even a little? Maybe. "That's more just a rule of thumb," Forgey says. "All the things we're talking about are really subtle differences. We're not talking about going from orange to green."

Even a subtle difference is worth considering when using accelerators, because they are added inconsistently as a matter of course, whether to stagger set time or offset an overnight drop in temperature.

"Using a nonchloride accelerator will have minimal to no effect on the ultimate color when using an integral coloring admixture," says Thome.

"Once the accelerator is no longer needed, gradually reduce the amount being used. This will minimalize the potential for dramatic color swings in the same area of the project."

Water Repellents

A water-repellent admixture decreases the permeability of a slab so that it keeps water out. "Once concrete is cured, water does not penetrate," Paris says. "Water beads on the surface."

But the effect may also intensify color, Sullivan says. The beads of resin that make up a water-repellent additive create a mirror effect from the inside, giving off a sheen just like a surface coat of sealer, he says. "It's putting a micro-sealer, if you will, on the inside. That's strictly light reflecting."

On the other hand, a stearate water-repellent may lighten the batch a little, Forgey says, if only because so much of it is needed to get the right effect.

Pozzolans

Many observers classify fly ash and other pozzolans as admixtures when they are added to batches to improve workability and plasticity. "It's a cementitious mixture, but it is marketed as an additive that offers different properties to a mix," Paris says.

If a pozzolan has a plasticizing effect, it will reduce the amount of water needed and may account for a richer color. But more importantly, of course, pozzolans come in their own colors, from light metakaolin to dark fly ash. "All pozzolans have some color to them," Thome says. "If the color of the pozzolan fights with the integral coloring admixture, the end result could be lighter or darker than intended."

Ready-mix producers have grown accustomed to substituting fly ash into batches without much thinking about it, Forgey says. "Historically, that was something people never much cared about. Nobody really looked at the look of the concrete."

So if a contractor doesn't want fly ash in a batch, the supplier needs to be told. "Like everything, it comes down to a good rapport with the producer," Forgey says. "Ready-mix suppliers are getting more into the colored concrete business. They tend to want to work closely with those customers to make sure they have the right mix."

And as always, testing is a good thing. "We always recommend some kind of test pour," Forgey says. "Try to keep everything — fly ash, sand — consistent after that." **CD**

Form Liners: Function & Beauty

by Amy Johnson

One of the greatest advantages of working in concrete is its versatility. When viewed as an artistic medium rather than simply a construction component, the material offers infinite possibilities for creativity. Many tools for expressing this creativity have been around for a long time, but they are finding new uses. One proven system receiving renewed attention is form liners.

Form liners are essentially molds for giving texture and design to vertical concrete surfaces. Dana Scott, marketing director of Scott System, Denver, Colo., describes form liners as "a reverse stamp." Instead of pouring the concrete and applying a texturing tool, the tool (the form liner) is attached to the form and concrete poured onto it.

Form liners have been widely used for years to beautify otherwise ordinary structures such as highway walls, sound barriers, bridge supports and retaining walls. This market continues to grow as more and more communities demand beauty as well as functionality from their highway systems. In many cases, budgets for these projects include a required amount for art, a requirement that can be met with form liners.

Municipal structures like picnic pavilions, pumping stations and restrooms are often constructed with concrete because of its longevity and ease of maintenance. However, more communities are now demanding that these structures be aesthetically pleasing as well as functional. As Isaac Sparks of Hunt Valley Contractors Inc., in Owings Mills, Md., explains, "Nobody wants an eyesore in their backyard." Form liners offer a practical technique for beautifying even these mundane structures. Sparks estimates using architectural concrete adds just 2 percent to 5 percent to the cost of the finished project.

In addition to traditional uses in roadways and public buildings, contractors and designers are starting to see new opportunities for using form liners in commercial projects, residential construction and landscaping.

Form lining systems

There are various materials and technologies for manufacturing form liners and each type has different uses and advantages. Plastic liners have the lowest initial cost,

"Spaghetti Bowl" (seen at the intersection of Interstate 15, Interstate 515 and U.S. 95 in Las Vegas) was designed with a flowing wave of color and texture combining three Scott System patterns: Rocky Mountain Flagstone, Oregon Basalt and Striated.

Photo courtesy of Scott System

The Melrose Housing Project in the South Bronx was built using Scott System's Brick Snaps for the walls and a traditional form liner for the contrasting entry.

Photos by Mike Valdez. Courtesy of Scott System.

Photos Courtesy of Hunt Valley Construction

but typically can be reused only a few times, if at all. They come in standard sizes and textures and so are not suitable for large or custom projects. Their low cost per square foot (from $2 to $8 depending on the material) makes them attractive for smaller-scale projects where there is no economy to be gained from multiple uses.

Urethane form liners are probably the most familiar and widely used. Scott System is one company that has been making urethane form liners for a long time. In fact, founder Buck Scott was the first to use elastomeric urethane as a mold material in the late 1960s. (He holds 20 patents related to form liners and brick embedded concrete systems.) Because urethane imparts clear detail to concrete, early form liners were used to beautify walls along highways, an application that is still a big part of Scott System's business today.

Urethane is also durable, which makes the liner highly reusable. The more times the liner can be reused, the more economical it becomes. For example, Jim Bohrer, a director at Custom Rock Form Liner, St. Paul, Minn., says that precasters reuse Custom Rock's Dura-Form liner between 50 and 100 times.

Large urethane form liners can be difficult to work with because they are heavy. Isaac Sparks, whose company Hunt

Photos Courtesy of Stresscon

The open system of the Panorama IV parking structure in Denver includes beautifully decorated architectural concrete columns and spandrels on the exterior. The textures were created with form liners.

Valley Distributors Inc. distributes Custom Rock liners, explains that patterns with a deeper reveal require thicker liners, which are made with foam-filled urethane to reduce the weight.

A brand new system for creating patterns for form liners comes from Europe and was introduced in North America at this year's World of Concrete. The Vectogramme Form Liner from German company Reckli is a computer-based, multi-step process for transferring an image onto a urethane form liner and, from there, to concrete. According to the company's literature, virtually any image in standard graphic format, like a logo or even a black and white photo, can be transferred. The Vectogramme system is distributed in North America by a Canadian company called Distrimat.

Another new system for texturing vertical concrete is not a liner at all. In 2004, Architectural Concrete Creations, Warren, Mich., introduced its new Arch-Crete wall forming system at World of Concrete, where it was recognized as a "Most Innovative Product." Arch-Crete is a manufactured form that combines a textured face with an integrated reinforcement matrix for support. No additional liner is needed. Company spokesman Hatem Hannawa names significant differences between the Arch-Crete system and traditional liners. First is cost. While a liner may cost $22 to $24 a square foot plus $12 a square foot for framework, this system costs about $22 a square foot total. It can also reduce labor costs by eliminating the step of fastening the liner to the form or backerboard every few inches. The system is generally lighter than standard forms and liners – about 57 pounds for a 3-by-6-foot form. Finally, the polypropylene and copolymer composition does not absorb water, so it releases from the set concrete easily and is extremely durable. Independent tests conducted by filling, vibrating, purging, rinsing and refilling the form indicated that it can be used for 1,500 pours. Besides the standard forms, Arch-Crete forms come in corners, T-walls, intersections, piers and columns.

Custom form liners can be manufactured to create almost any design desired. Leaves, fossils, mountains or local cultural icons are popular custom designs. Reusable form liners in standard designs are the most economical to use and these patterns, like many concrete imprint systems, echo natural stone — river rock, cobblestone, boulders, etc. Custom Rock actually uses real stone to mold their urethane liners. Their patented system is designed to create a nonrepeating pattern by using liners that can be rotated and "puzzled" together to avoid a straight line where one liner meets the next.

Other form liner patterns include wood, bricks or blocks, and the "fractured" ridges that are closely associated with vertical concrete. Rock shapes made of concrete are significantly less expensive than natural stone and stone veneers.

Cast-in-place, MSE and precast

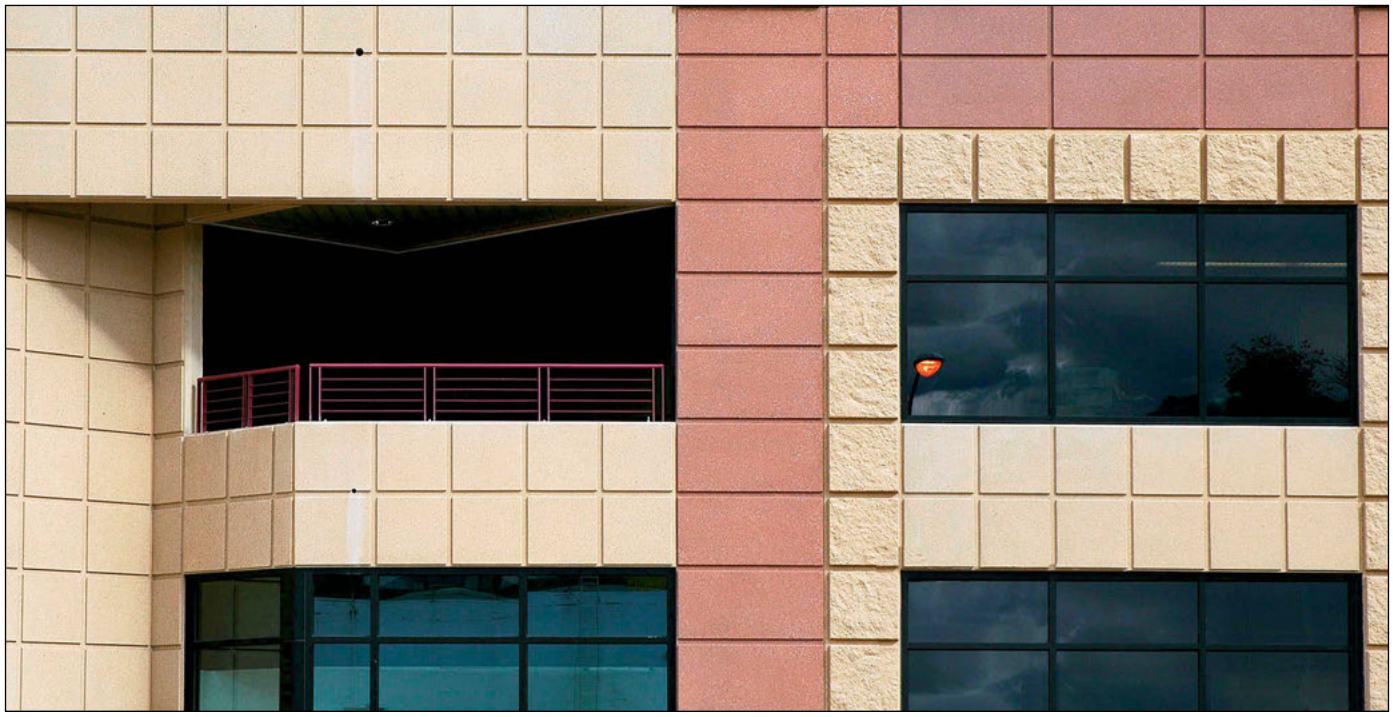
Form liners can be used with just about any method of casting concrete for vertical uses. When used for cast-in-place projects, liners can be attached to both sides of the form so both sides of the concrete can be textured at the same time. Cast-in-place is used on-site for large installations and is well-suited for art installations.

Casting on site with form liners is beginning to find its way into the residential market. Steve Chakonas, president of Complete Concrete in Sykesville, Md., first saw form liners at Hunt Valley Distributors when he was picking up supplies for imprinting flatwork. He soon realized he could use form liners and concrete instead of dry stacked stone to quickly build seating walls and garden retaining walls.

"We're giving people a prettier look than just dry stack stones," Chakonas says. "We'll pour a wall in a dry stack pattern and top it with granite to make a sitting wall or property divider. It looks better because we can stain it different colors. It goes nicely with all our stamped concrete. And I can control the job. I pour the footer and wall at the same time. Later that day I strip the form and it's done."

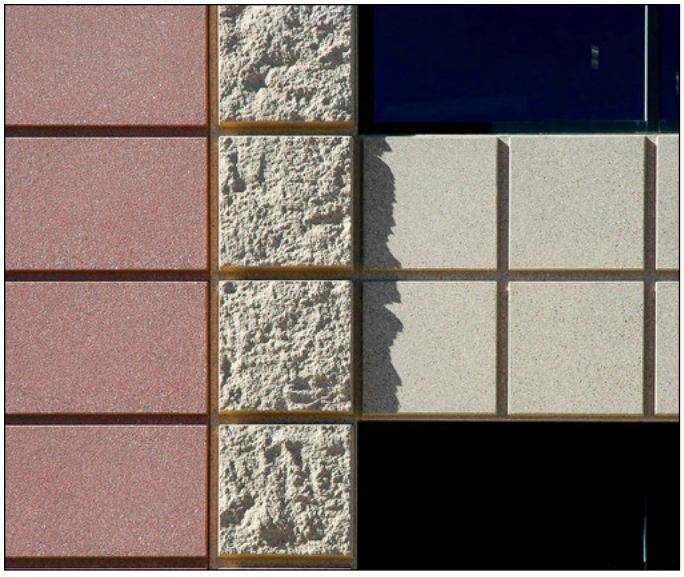
Chakonas says he can do in a day what ordinarily might take three or four days. "And because it weighs 2 tons for every 10 feet, it is a true retaining wall."

Mechanically stabilized earth (MSE) panels are used specifically for large retaining walls. Reinforced Earth panels made by The Reinforced Earth Co. are made of layers of granular backfill and reinforcing strips. They have a high load-carrying capacity and so are used for very tall or heavy-loaded retaining walls like those along highways or



Photos Courtesy of Stresscon

Urethane form liners used for portions of the exterior of Four Gateway Plaza in Colorado Springs give the look of stone while offering the economy and erection speed of precast concrete. This texture contrasts with the smooth acid-etched surfaces, which bring out the brilliance of the aggregates in the architectural face mix.



rail lines. They are faced with modular precast concrete with textures created using form liners.

Precasting with form liners may be the area of greatest innovation right now. Of course, precast has a set of unique advantages. Forms that are made in the shop can be made to tight specifications and reused multiple times. Concrete is poured and cured under clean, controlled conditions for consistently high quality. Timing is controllable and not dependent on other trades. All of these add up to the capability to replicate panels of the same quality to the same specifications time after time. Jim Bohrer, director of Custom Rock Form Liner, says this technique is valuable for sound walls and wing walls for precast bridge sections, among other uses.

Brick patterns are popular for projects like homes, parking structures and commercial buildings. Scott System makes several products that deliver a brick look. A form liner in a brick pattern was used for housing in Denver's Montbello neighborhood in the early 1970s. Scott System also developed a liner that allowed the contractor to insert thin bricks into gaskets and pour concrete over the back of the assembly. The concrete and bricks become an integrated structural panel. This product evolved into the Brick Snap system, where individual thin bricks supplied with plastic carriers are placed into the form, the concrete poured, the panels erected and the disposable plastic templates removed. This system is more practical for tilt-up applications where many panels are cast at once, unlike precast operations where the same form liner can be used multiple times in sequence. The Melrose Housing Project in the South Bronx was built using Scott System's Brick Snaps for the walls and a traditional form liner for a contrasting entry. Dana Scott estimates that demand from the tilt-up market for this product has increased 40 percent nearly every year since it was introduced in 1996.

Demand for architectural concrete has grown explosively over the past 15-20 years. To keep ahead of the trend, designers and contractors are constantly looking for new techniques and applications, even from old technologies. Form liners are the next logical step. As Arch-Crete's Hannawa says, "What stamp mats have done for flatwork, this does for vertical concrete walls." **CD**

Photos by Ken Tucker

Turning Tilt-up Upside Down

A resourceful contractor solves a potential color problem with a new process.

by Amy Johnson

It's a good thing Ken Tucker relishes a challenge, because he faced one when constructing a new warehouse/shop for his company, Pattern-Crete Inc., in Villa Park, Ill. Since he owns a concrete business, he naturally wanted a concrete building. He wanted to use tilt-up construction, but didn't have the space to cast all the panels at once. That raised the question — would he be able to make the colors match with batches poured a month apart?

He also wanted the building to showcase his business, which is 80-90 percent colored, stamped concrete. Tucker

Photos by Ken Tucker

figured he had a better chance at a color match if he used surface colors on the two pours. So he turned the challenge to his advantage by combining tilt-up with standard imprinting techniques.

On the face of it, this approach is quite literally backwards. Traditionally, the face surface of the tilt-up panel is the bottom of the pour, where the concrete meets the form. Tucker's idea was to turn things around and make the top of the pour the decorative face. He poured the panels into forms set in the only place where there was room — where the building's foundation was going in. Even there he had only enough room to pour half the panels at once.

Tucker poured and finished the concrete, and while it was still wet he broadcast a color hardener. He used Brick Red from Butterfield Color as the field color and accented it with Deep Charcoal. He used the same charcoal for the release agent. Then he imprinted the panels with a heavy

Pattern-Crete Inc. warehouse/shop
Villa Park, Ill.
Builder: Pattern-Crete Inc.
Owner: Ken Tucker
www.patterncreteinc.com

stone-texture embossing skin. He created a recessed horizontal band by using a slate pattern border stamp. The border was colored dark charcoal and lines were hand cut for added interest.

The tricky part was lifting the panels. Each of the 23 panels was 24 feet tall and contained 6.5 yards of concrete. As the name implies, cured tilt-up panels are literally tilted up into place with the form protecting the face. In this case the face was already exposed, so Tucker had to devise a system of lifting hardware and reinforcement to prevent the panels from flexing and breaking. Fortunately he had some experience in structural concrete – a colleague who jokingly called him a "flathead" (flatwork-only contractor) had inspired him to move beyond driveways and patios some time before. Now he relied on his basic understanding of reinforcement and flexural strength. The rest was experimentation. The technique was so successful that Tucker has applied for a patent.

Logistical challenges aside, what does Tucker say he likes about the results?

"Everything! I just love it. I love decorative concrete and I think this is just beautiful. Tilt-up generally only has joint lines or reveals to give it character. Or you can paint it. That's it. This puts the decorative feel into tilt-up construction. I think the possibilities are unlimited."

The technique promises to be more than a novelty. Tucker says a lot of people have expressed interest in the process. He sees potential for residential construction, especially for rebuilding in hurricane-ravaged areas. So who knows? This backward approach may be the next step forward in architectural concrete. **CD**

Photos by Doug Carlton

Stepping It Up with Decorative Concrete

by Doug Carlton

I must be honest. I don't like April 15 and I don't look forward to pour days that include steps. It's that same pit-in-the-stomach feeling for both, I guess. You know what I'm talking about — when you have to do something you don't want to do because you're unsure of the outcome. But boy, the feeling of accomplishment when you're finished.

Success for both taxes and step pours is in our control, but I'm not touching the tax thing. The goal of this column is to provide a step-by-step progression for the installation of decorative steps.

Many decorative concrete projects require steps to transition from one elevation to another, and the steps need to be as decorative as the rest of the project. Let's cover the process of turning ordinary steps into colorful decorative steps.

Sifting color.

STEP ONE: Add a form liner to your riser

The form liner will shape the vertical surface or step. There are many shapes to pick from, but I recommend choosing one or two styles and mastering these. Remember, the key to all decorative concrete is to become familiar with the tools and products you are using. I personally like the bull-nose-style liners. They work great with step lights by providing a safe spot for the light to tuck under the nose of the step.

Attaching the liner to the form board is somewhat easy. These liners are usually made of a poly foam material that is quite flexible. Most are thrown away after one or two uses. The poly foam can be easily attached by nailing through the form liner and into the step board. You may try placing a 2-inch strip of duct tape where the nails penetrate the poly foam to help keep the nails secure. As you can imagine, the poly foam is delicate. Trim the form liner flush with the bottom of your riser board just before attaching it. Remember to allow for the thickness of the form liner when setting your steps.

Photos by Doug Carlton

Coloring the face of the step.

Finishing the bull nose with a profile tool.

STEP TWO:
Placing the concrete

This is a good time to have a "Come to Jesus" meeting with all connected with the pour. This includes your crew, the ready-mix driver and the pump operator. Stress the importance of maintaining slow and controlled concrete placement. Double-check your staking to make sure you have plenty of support.

Pour the concrete as dry as possible to eliminate pressure against your formwork, and take your time. You may try vibrating or tapping the riser lightly to eliminate all voids on the vertical surface of the form liner. Float the tread or surface of the step so that it is level with the bottom of the step above. This is critical to insure proper slope and simplify the finishing process that is soon to come.

STEP THREE:
Coloring your steps

You have a couple of choices here: integral coloring, where the color is in the mix, or cast-on color, with color hardeners. There are pros and cons for both, but I recommend integral coloring for new crews and color hardeners for experienced ones. Putting color in the mix will eliminate one step in the path to successful installation of decorative steps. On the other hand, color hardeners offer many more color choices as well as more control of the finishing process. You decide which option is most comfortable for your crew as well as best for your customer.

Timing, timing, timing. It's essential. And it is different for every job, according to weather conditions. Knowing when to pull stakes and start removing the forms with the form liners attached is critical. Early stripping will create slumping on the nose of the step, while late stripping will usually end with a poor finish. You have the most control before the concrete is poured. Start off with small yardages

and lengths of steps, and pour one or two steps at a time. Turn off the cell phones and tell visitors or curious customers now is not the time. Most people have no idea the degree of difficulty most decorative projects entail.

Use a profile tool on the face of the step once the liner is removed. The tool can usually be purchased from the form liner manufacturer or simply made in the field by wrapping duct tape around a 4-inch piece of the poly foam liner. The tape will wear and need to be replaced often. I recommend having several of the profile tools made well in advance of the concrete placement. They will fill voids and smooth the step as needed.

As the smoothing process is repeated while the concrete hardens, add sifted color hardeners to the face of the step and smooth with the profile tool. My crew usually turns the sifted color hardeners into a paste and brushes thin coats of it onto the surface. The hardeners mitigate the effects of the small-sand aggregate that will drag or scar the face of the step during profiling.

STEP FOUR: Finishing the steps

Our crew usually stamps the surface of the step and not the riser or face. This makes the step more friendly to foot traffic and less dangerous. You may decide to brush all or part of the step. Pick a fine or light brush to apply the finish to your steps. This will help blend the surface as well as provide for safe travel. If stamping the tops of the steps, try to pick a less aggressive pattern and lightly stamp the impression into the surface. Remember that the nose of the step is delicate and will slump until hardened. Small texture skins work well for this process and may require two people to complete the job.

Finishing the step face.

STEP FIVE: Protecting your new steps

Don't assume that everyone knows not to walk on your work. Decorative steps can look aged even when they are new. Protect your work with caution tape to create a safe space until the steps are strong. Let them cure completely before detailing and sealing. Be sure to add a nonskid agent to your sealer for protection and apply light coats to help eliminate runs.

Good luck and happy stepping. **CD**

ProMix from STOW Construction

Portable Mixers

The new **PortoMix** from **STOW Construction Equipment** is billed as the ultimate concrete mixer for homeowners, contractors and do-it-yourselfers.

The unit's sturdy polyethylene drum mixes up to 3 cubic feet of material and comes with a strong steel frame. It's powered by a reliable 3/4-horsepower, 115-single-phase Baldor electric motor that can use standard household power. Measuring 34 by 23 1/2 by 48 1/2 inches, it is small enough to fit into the trunk of a car. It is fitted with replaceable blades bolted to the drum, while its stand permits 360-degree rotation. Other standard features on the 138-pound mixer include a dustproofed on-off switch, an improved gearbox for reduced friction operation, and pneumatic wheels for greater mobility. The PortoMix can even be used as a wheelbarrow to transport concrete, debris and other materials.

For more information, visit www.stowmfg.com or call (877) 289-7869.

Whiteman plaster/mortar and concrete mixers are heavy-duty mixers from **Multiquip** that are reliable, easy to maintain, and offered in a full range of sizes and engine configurations for virtually any application.

The Whiteman family includes three concrete mixer models, with capacities of 4 cubic feet, 6 cubic feet and 9 cubic feet. Each comes with a choice of either steel or polyethylene drums and a host of engine options, including Honda and Robin, and all are built with rugged 14-gauge steel engine covers. Other features include an easy-loading drum, heavy-duty one-piece cast iron ring gear, a multiposition dump latch and a heavy-duty retractable tow tongue.

For more information, visit www.multiquip.com or call (800) 421-1244.

With capacities of 2 cubic feet, **Little Champ mixers** from **Stone Construction Equipment Inc.** are ideal for small mixing jobs.

Modular, compact and sturdy in design, the Little Champ comes in three configurations to satisfy the needs of any small contractor. The 25CMP is a wheelbarrow-style mixer for easy transport, lifting and dumping. It features 6-inch turf tires and adjustable handles. The 25CMPT, a pedestal-style mixer, offers an adjustable drum angle and turns 360 degrees for easy loading and precision dumping. Its three-part pedestal is easy to assemble.

The 25CMPC combines features of the other two mixers for a model that offers the transportation convenience of the wheelbarrow version and the charging and discharging capability of the pedestal model. The heaviest of the three, it weighs only 148 pounds.

All three models feature an easy-to-clean poly drum, steel mixing blades and a 1/3 hp electric motor.

For more, visit www.stone-equip.com or call (800) 888-9926.

The easy-tilt feature of the **Hippo Mixer** from **HoverTrowel Inc.** helps contractors transport and pour materials with ease. What's more, its motor makes it a natural for mixing self-leveling materials.

With a mixing capacity of roughly 18 gallons, the Hippo is powered by a high-torque, 16-amp, two-speed motor. The Hippo's drum shape and helical mixing paddle with shear bars create a vortex to provide sufficient lifting and shearing action when mixing these batch sizes. A paddle with comparatively large diameter increases periphery speed, reducing the flash curing that comes with the increased temperatures created by high rpm speeds.

For more, visit www.hovertrowel.com or call (610) 856-1961.

Photos courtesy of Brickform

Stamping an Overlay

Concrete Décor 's Technique section is designed to offer readers helpful information on methods for properly preparing concrete surfaces and installing decorative concrete products. This month, we'll focus on techniques for stamping an overlay.

Thanks go to Clark Branum of Brickform for sharing his expertise.

1. Texturing the wall line prior to stamping

Near the placement of your first stamping tool, use a highly flexible texture skin — one that matches the texture of your stamping pattern — to apply texture along walls or around posts that prevent the stamp from lying flat. The flexible texture skin will be used periodically to address other hard-to-reach areas as work progresses across the project surface.

2. Initial placement of the stamping mat

Provided the wall of the building and any adjoining slab are perpendicular to one another, and you are using a square-pattern stamping tool such as the 36-inch Ashlar Slate shown here, begin with the edges of the stamp aligned to a corner of the area you are stamping. If the wall and any adjoining slab are not perpendicular, a square patterned stamping tool, as shown, should start with the placement of the stamp on a 45-degree angle.

Where walls or adjoining slabs are not in alignment, an applicator should also consider more random stamping patterns as a way to avoid layout problems.

3. Using a floppy mat near the wall

Stamping tools can be purchased in varying densities in order to provide increased flexibility at walls or posts. In this application, a floppy mat helps carry the pattern into the already textured wall line, and is used to reach into tight corners, allowing for increased surface coverage and a better finished edge.

4. Stamping a row

Having an adequate supply of color-coordinated or labeled stamping tools on hand is critical to prevent repeat patterns or lines from appearing on the finished work. Lines or repeat patterns can be avoided by varying the use of the stamp colors, as shown here. Notice that from right to left the forward row shows a red, yellow, red, and a blue. The next row can now start with a blue, red, yellow, red or any variation that is inconsistent with the previous row.

It is critical to keep the rows aligned as you move forward. You should always have enough stamps on hand to span the area in one direction and start your next row.

5. Use of the Tamper

Compared to stamping a new concrete surface, tamping a pattern onto an overlay requires less force. In fact, tampers for stamping an overlay are larger at the base so as to displace some of the force of the pounding over a larger area. Making sure that the tamper lands flat on the surface of the stamping tool is critical. With an overlayment, tamping up to the edge of the stamp is okay, provided the applicator is careful not to hit the stamp excessively.

Often with overlay texturing the tools may be walked into place without the use of a tamper. The secret is that the depth of the tool should not exceed the depth of the overlay.

The 24 ultra-thin canopies over the Shawnessy Light Rail Train Station in Calgary are just 3/4 inch thick yet span 20 feet between columns. The graceful canopies and multi-branched columns are constructed from Ductal.

Photo by Lafarge

Ductal: A Solution Looking for Problems

by Michael Chusid

Ultra-high strength concrete allows freedom of design and expression.

Would you like to increase performance by 1,000 percent? Now you can, using a new type of concrete that is up to 10 times stronger than common concrete mixtures. This impressive feat can be accomplished with Ductal, a revolutionary, ultra-high-performance material that delivers up to 30,000 psi compressive strength and rivals the strength of metal.

While steel maintains a significant advantage in tensile and flexural strength, Ductal has reduced that gap as well. Normal concrete, for example, has almost no flexural strength, yet Ductal offers flexural strengths up to 6,000 psi. This is closely related to the material's amazing ability to bend (within limits) without breaking — a property called "ductility" and the inspiration for its name. Where ordinary concrete is brittle and shatters catastrophically when it fails, Ductal will stretch as it reaches its load limit, making structures more robust and providing extra margins of safety.

Clearly, this is exciting news for leading-edge structural engineers and architects who challenge themselves to "do more with less." It should be exciting news, too, for everyone interested in decorative concrete. That's because the performance of the new material demands a reassessment of the aesthetic and functional possibilities of concrete construction.

The material's strength enables it to be used in very thin sections. This, in turn, reduces the weight of a structure and allows the use of larger pieces with fewer joints. Ductal is extremely fluid and self-placing,

allowing it to be cast into complex shapes. It produces surface textures and appearances unmatched by conventional concretes. And it is so durable that it can be used without fear of the elements for enduring structures and monuments.

Big performance — small particles

Ductal is made by Lafarge, a leading global producer of construction materials, and is available through Lafarge North America. Ductal contains many of the same materials used in ordinary concrete — portland cement, silica fume, fine aggregate, and superplasticizers, and is blended with either metallic or poly-vinyl alcohol (PVA) fibers. Each ingredient, however, is tweaked to supercharge their collective performance. For example, fine aggregates are supplemented with very fine silica particles in the form of quartz flour, thereby filling the gaps between other materials to increase density and cementation.

The scientists at Lafarge explain that Ductal enters the realm of nanotechnology. Ordinary cementitious materials do not react completely when mixed with water. Ductal overcomes this by using ultra-fine particles of cementitious materials and manipulating their particle size distribution. At such a small scale, material behaviors change and, as a result, Ductal's performance is an order of magnitude beyond conventional technologies.

Low water/cementitious material ratios characterize high-strength concrete, and Ductal's w/cm is exceptionally low. Lafarge has had to institute special batching and mixing techniques to make the mixtures work with high fluidity.

The result is Ultra-High Performance Fiber Reinforced Concrete with the unwieldy abbreviation "UHPFRC." I prefer the French terminology, "Béton Fibre Ultra-hautes Performances" because its abbreviation, "BFUP" sounds like a nasally pronounced "Beef Up" and suggests what Ductal does to concrete.

Visually, Ductal produces an exceptionally fine-grain surface that mirrors the texture of the mold material. Cast it against fabric, for example, and it will look like fabric. Sandblasting can be used to roughen the surface, something that may be useful if one is trying to match the appearance of conventional concrete.

Ductal is produced as either a white or gray powder and can be integrally colored in a wide range of shades. Fabrications are striking in the visual uniformity of their coloration. Rigorous quality control, watertight molds that prevent leaching, and a fluid mixture that does not segregate or form bug holes, flow lines or segregation can make the concrete remarkably free from mottling.

Interesting effects can also be produced by swirling together different colors; the rheological characteristics of Ductal enable the colors to mix without blending, as would happen with ordinary concrete mixtures.

Shannon Loewen

Designer Omer Arbel's 8.0 Chair used Ductal to shatter any preconceived images of concrete furniture. "The concrete is very, very, very, very strong," Arbel says. "It allows me to create this incredibly thin, cantilevering form."

Photo by Ed McBain/GPA

Line and Space LLC Architects won a design competition for new bus-stop furnishings in Tucson, Ariz. Their modular solution was constructed with Ductal to assure low maintenance, high visibility and durability against extreme heat.

Photo Courtesy of Olivier Bucourt

The low permeability and high durability of Ductal makes it an intriguing material for plumbing fixtures. As shown by this tub designed by Francesco Passaniti, the thin sections provide sculptural opportunities not possible with thick concrete tubs or washbasins.

Business opportunities

Lafarge is taking a cautious approach towards introducing the technology, preferring to view it as a service as well as a product. "We have developed a range of Ductal mixtures, and work with each customer to understand what they are trying to do," explains Vic Perry, vice president and general manager, Ductal/Lafarge North America. "If Ductal is appropriate for their project, we engineer a mixture that meets their specific requirements and work with them to assure proper fabrication procedures are followed."

According to Perry, "Ductal is a solution looking for problems." He says that someone might want to use Ductal because of its outstanding strength-to-weight performance, its low permeability and high resistance to abrasion, corrosion, freeze-thaw, and other forms of deterioration, or to create a shape or appearance not possible with other materials. "Ideally," he says, "we look for applications where Ductal can solve several of these problems simultaneously. Otherwise, it is likely that another material could be a better solution." Ductal, he says, can be used as an alternative to metals, plastics, resin, and ceramics as well as conventional concrete.

Ductal is so new and so different that, Perry continues, "You have to forget almost everything you know about concrete and start from scratch." Equipment, mixing, casting and curing techniques are all different from conventional production. Instead of ordinary formwork, for example, it is necessary to use completely watertight molds to contain the highly fluid Ductal mixtures. To date, Lafarge has only authorized the use of the material for precasting since the quality assurance required can be best achieved under factory conditions.

If Lafarge agrees that a potential project or application is suitable for Ductal, the company may license a customer to

Fish Story for the Record Books

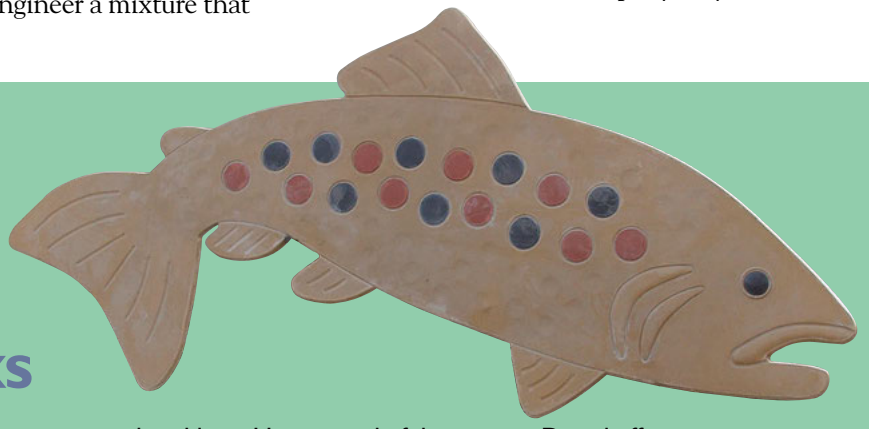


Photo Courtesy of Lafarge

When planning your next fishing trip, check out the big catch in the Canadian city of Calgary, where 144 trout over 15 feet long will soon be seen "swimming" alongside the daily traffic at a busy interchange. Thanks to a city program that provides funds for art on major projects, the fish are part of a unique retaining wall project built by Lafarge's Alberta Precast Division. Artists Violet Costello and Bob Thomasson designed the fish and envisioned the wall as a river, swarming with trout.

Ductal ultra-high strength, fiber-reinforced concrete offered solutions to several problems. Upon award of the project, Lafarge's Precast team successfully proposed a post-installation process rather than the more typical method involving casting of profiles directly into retaining wall panels. With Ductal and a new forming technique using 3-D digital modeling, the fish can be produced in various colors, shapes and textures. The bas-relief sculptures range from just 1 1/2-inch thickness to a maximum of 2 1/2 inches and weigh approximately 850 pounds, far less than would be required with conventional concrete. This makes it possible to mount the fish directly onto the retaining wall system. Furthermore, Ductal offers greater resistance to freeze-thaw and corrosion from de-icing salts and other substances.

Full-size models of each fish were carved from medium-density fiberboard using CNC routers. Molds were then made from the models using urethane. The project, which will be completed this summer, requires a variety of fish. Those swimming below the "water's surface" will be cast in natural grey Ductal, while those leaping out of the water will be produced with integral coloring.

For additional information, visit www.imagineductal.com.

use the material, and then work closely with them to design and test prototypes and launch production. Because a small project can take as much front-end work as a larger project, Perry says Lafarge is most receptive to proposals for large projects or products with multiple production runs. But he acknowledges that his firm makes exceptions for "interesting projects that help us showcase the material or learn more about Ductal's capabilities."

What do you want to build?

This means you probably won't be using Ductal for paving or slabs on grade. Or does it?

Ductal gives us freedom to re-imagine how we build. I am visualizing thin precast concrete panels with tongue-and-groove edges. They are about 60 inches by 60 inches and are supported only at corners where they rest on posts driven into the ground. Sure, the concrete panels might cost more than four inches of ready mix, but the cost might be offset by reduced substrate preparation and labor. Now, imagine casting the panels with color and texture, eliminating the need for applied finishes and passive reinforcement, and you can start to visualize the possibilities when you BEEF-UP concrete.

Is this idea realistic? Time will tell. But decorative concrete artisans are not likely to sit around and wait for others to pave the path forward. Thinking about Ductal and what you want to build is just the stimulus you need to boast your imagination by 1,000 percent or more. Go for it! **CD**

Michael Chusid is an architect, a Fellow of the Construction Specifications Institute, and a member of the American Concrete Institute's Committee 124 – Concrete Aesthetics. His company, Chusid Associates, is a building material consultant. He can be reached at www.chusid.com.

Photo by Chris Becker

The Question of Warranties

by Stacey Enesey Klemenc

How long should you guarantee your work? It all depends on who you ask. Four successful contractors from California to New York share their philosophy on warranties.

It's pretty much a given in this business: Somewhere along the line, concrete is going to crack. No one in their right mind is going to guarantee otherwise.

"We actually have contractors that guarantee concrete will crack," says Ira Goldberg, president of Beyond Concrete, a New Jersey-based Bomanite and Lithocrete franchise that was formerly named Bomanite of New Jersey, New York City, Long Island and Eastern Pennsylvania. "We tell our customers there is always a potential for cracking but we do everything to ensure that it won't."

He says Beyond Concrete will repair any color delamination, surface spalling and significant cracking that may appear within one year from the date of installation, no questions asked. The one-year guarantee is standard fare for most decorative concrete contractors across the country, although many will stand behind their installation for an indeterminate amount of time depending on the project.

Goldberg says his company shies away from extended deals. It used to offer a warranty where the company would come out every two years to power wash, touch up and reseal, but Goldberg felt much of the work was unnecessary. "We found that it's usually three to five years before something needs to be washed and resealed," he says. "We think our clients are better off just calling us when they need our services."

Securing a guarantee

While most contractors warrant the installation for a year, most manufacturers guarantee their products for five to 10 years. However, cautions Rick Smith of Richard Smith Custom Concrete in Canoga Park, Calif., "Most companies have a backdoor to get out of their warranties. If you read the fine print, you'll see that a lot of products aren't good for certain

applications and aren't meant for certain environments. Companies can always say the failure was due to improper product installation."

To nip this problem in the bud, Smith — who's been in the business for 25 years — says for the big jobs he insists that manufacturers send out a rep to walk them through their system. "There are companies that warrant their products for 10 years but only if you use their entire system" and use it to their specifications, he says. With a manufacturer's rep on the job site, "It's all documented and they can't say it was installation error." Plus, he adds, the client dotes on the extra attention.

Smith says he never loses sight that his company is "just the installer" and he never extends the warranties beyond the manufacturer's claims.

He also makes a point of telling his clients everything that can go wrong with a job. Before his company begins a job, he drafts a letter recommending a series of products and techniques that he thinks should be used to ensure the concrete won't discolor or crack. "If the clients don't want to spend the extra money, they sign off on it," he says.

But if something goes wrong during the application, Smith continues, he makes sure he has a plan B. "Whatever we do, we make sure we have a backup in the wing," he explains. "It doesn't matter how great a product is, sometimes there can be failure."

Before the concrete is even poured

Goldberg believes that one of the best ways to prevent failure is through education — for those who specify concrete. "I teach architects about proper control jointing, spacing of boxes and other concrete procedures," he says about his regularly scheduled American Institute of Architects-accredited seminars on architectural concrete. Participants also earn continuing education credits.

By teaching those who specify concrete, he says, he helps head off potential problems. "I believe more important than a warranty is getting the job done properly in the first place. And that means installing concrete to the finest procedures you can follow," says Goldberg, who's known in the Bomanite circle as a "specialty concrete guru."

The lost art of customer service

While Brian Vicari, owner of The Concrete Colorist in Benicia, Calif., near San Francisco, doesn't argue that proper installation is key to a job, he urges contractors never to lose sight of the importance of customer relations.

Like many others, Vicari offers his customers a one-year warranty. "And I let them know the manufacturer stands by the product for five years," he says. "But if something does happen, other than abuse, all they have to do is pick up the phone and call me. I'm very lenient with my warranties.

I've had people who have called two or three years later and I've gone out and done touch-up work free of charge."

That small goodwill gesture keeps clients happy, and they will likely tell others, he explains, which leads to more work in the long run. "It's an amazing selling tool," says Vicari, who specializes in microtoppings, acid stains and dye washes. "The most important thing is to stand behind your product."

Because he offers this service as part of his standard fare, he hasn't felt the need to offer his customers an extended warranty.

Warranting beyond the first year

Chris Becker, president of Becker Architectural Concrete in St. Paul, Minn., also offers the standard one-year warranty that goes along with application failure due to the product or installation. "But we're getting asked more and more about extended warranties," he says. "So we're implementing a warranty program where we'll stand behind the products for any length of time if we enter into a maintenance contract with the client."

For example, he explains, his company recently did a stamped concrete floor for a Hummer dealership. "The owner had no idea how to take care of it, so we put together a proposal where our staff comes out once a month and inspects, deep cleans and waxes the floor. And once a year, we'll do an intense wax removal and recoating."

The agreement is an annual renewable warranty with a flat monthly fee that covers work detailed in the contract. It's understood that if his company has to go above and beyond what's outlined — say, a

Photos in this spread by Chris Becker


Photo by Chris Becker

Hummer leaked oil all over the showroom — the client would be given a separate quote for the extra work.

"It's a great setup because the owner knows we're in a position to fix the floor. If anything significant happens to it, we're already part of the solution," says Becker, whose company caters to higher-end projects and one-of-a-kind applications in flooring, stamped concrete, paving and countertops.

He says his company's extended warranty program is a new offering just beginning to take shape. "I think it's ridiculous being part of a solution without getting paid for it, so we decided to become proactive," he says.

Although the extended warranty program was set up primarily for commercial projects, he's toying with the idea of offering it to homeowners as well. For example, he may quote a price to put in a driveway and a separate annual fee if the project is going to be guaranteed for, say, five years.

"We would come out once a year to power wash and apply a sealer," says Becker, adding that the Minnesota climate is more extreme than many other areas in the country. He envisions this warranty outlining specifics on how the homeowner should take care of the concrete between servicing. "Like a car, if you don't do the oil changes or perform regular maintenance it will void the warranty," he says. And similar to insurance, the price would fluctuate depending on coverage.

"Many people have the perception that concrete is bulletproof, that you never have to do anything to it to keep it looking good," Becker says. "It's risky for people in our business to say they'll stand behind their work when they don't know how people are going to take care of it." **CD**

Product News

Generate some results

Mi-T-M Corp. has begun manufacturing a full line of portable 3,200-watt and 4,300-watt inverter generators for the rental and construction industries.

The generators feature inverter technology that reduces size, weight, noise and fuel consumption and produces commercial-quality AC power for sensitive electronic equipment. They are powered by Subaru OHC engines with low oil shutdown and electric start. All Mi-T-M generators have USFS-approved spark arrestors, are circuit-breaker-protected and meet CARB and EPA emission standards.

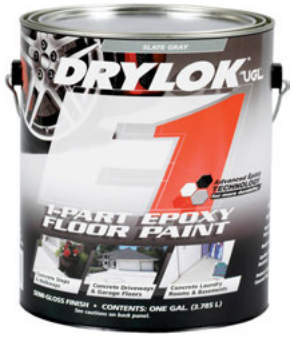
For more information, circle 72 on the Reader Service Card.

Easier epoxy

E1, a one-part epoxy floor paint from United Gilsonite Laboratories (UGL), is a heavy-duty floor paint that compares to two-part epoxies but is more do-it-yourself friendly.

The epoxy floor paint is resistant to oil, grease, petroleum products, antifreeze and chemicals. It eliminates dusting, caulking and dark staining. The semigloss sleek finish comes in four colors: Slate Gray, Light Platinum, Natural Sand and Arctic White.

For more information, circle 73 on the Reader Service Card.



The Power of One

Vexcon Chemicals Inc. has introduced PowerCoat One, a one-component, breathable epoxy coating that promises the same benefits and performance as two-part epoxies.

The eco-friendly, water-based epoxy meets the strictest VOC regulations, is easy to use, resists stains, gasoline and hot tire marks and is virtually odorless. It requires no primer and features Vexcon's PowerCoat Breathable Technology, which allows moisture vapor to pass through the coating. PowerCoat One is available in clear gloss, clear semigloss and 17 standard colors, with custom colors also available.

For more information, circle 74 on the Reader Service Card.

The Power of Powers

The C4-LT Trak-It Tool from Powers Fasteners Inc. is the industry's first gas-fired tool with the power to fasten two-by-fours to concrete.

The new tool boasts the reliability, speed and convenience of the Powers Trak-It gas-firing system, but it uses a refined Trak-It gas cartridge and chamber that provides a slightly more powerful charge for firing 2-1/2-inch pins through wood into concrete. It features Powers' exclusive easy-to-remove latched opening on the nosepiece, enabling contractors to remove misfires without needing to disassemble the handle. To learn more, visit www.powers.com.

For more information, circle 75 on the Reader Service Card.

Angle grinders with Smart Power

Hilti has released its first angle grinders equipped with the company's unique Smart Power system and Active Torque Control (ATC).

The new 5-inch DEG 500-D and 6-inch DEG 600-D and DEG 600-P all feature Smart Power, which maintains a constant level of grinding speed for less wear and tear on the 1,400-watt motor. A low-profile gear case provides better access in tight areas and, if power is interrupted, a restart interlock helps prevent accidental starts. For added operator protection, the ATC function interrupts the electrical current into the tool in a fraction of a second to reduce unwanted kickback if a sticking disk causes the tool body to move too quickly.

For more information, circle 76 on the Reader Service Card.

Scarifiers repair slab problems

The new Blastrac BMP-250-X scarifiers provide versatility for surface preparation jobs. These 10-inch scarifiers, in gas or electric models, control dust while scarifying, planing, cleaning and resurfacing concrete, asphalt and steel. They repair common slab problems and remove paint and coatings, traffic lines, mastics, adhesives and rubberized coatings. Features include a side-loading drum that provides access to quick-change drums and cutters without tipping the machine. Twin-system depth control is fast and accurate for better results. Bearings are sealed for lower maintenance, and a toothed pulley/belt drive system prevents slipping.

For more information, circle 77 on the Reader Service Card.

Let the good times roll

Bon Tool Co.'s RockN' Roll Bracket for bull floats and fresnos provides full up-and-down pitch with just half a turn on the handle, a design that eliminates side-to-side movement on the bull float.

The RockN' Roll is made of high-strength aluminum casting with a heavy-duty turning mechanism and zerc grease fitting. It can be fitted with 1¾-inch and 1 ⅜-inch button-type handles and two-hole and four-hole fresnos and bull floats. The new bracket is part of Bon's "build your own bull float" product line, which encompasses more than 20 handles, seven handle adapters, a universal four-hole to two-hole adapter, and additional brackets, including the popular Rite-Height Adjustable Bracket.

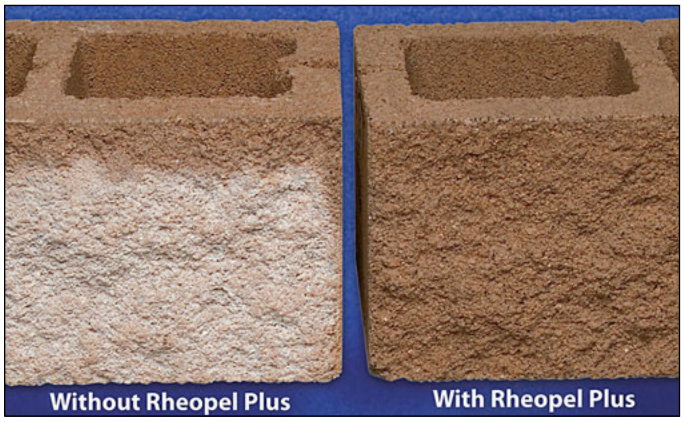
For more information, circle 78 on the Reader Service Card.

Get the "Wet Look"

Triangle Coatings Inc. has introduced White Mountain "Wet Look" Lacquer, which conforms to the strict VOC compliance regulations of Southern California while protecting and beautifying concrete, brick, masonry, stone and tile.

"Wet Look" provides clear, deep-penetrating, stain-blocking protection and natural color enhancement for exposed aggregate, unglazed clay pavers, and colored, stamped or embossed concrete, stone and slate. The lacquer is solvent-reducible, nonyellowing and easy to apply.

For more information, circle 79 on the Reader Service Card.



A powerful water repellent

Degussa Admixtures Inc. has introduced Rheopel Plus Water-Repellent/Efflorescence Control Admixture, a significant breakthrough in WR/EC admixtures for the manufactured concrete products and precast and prestressed concrete markets.

The novel chemistry of Rheopel Plus admixture gives it superior water repellency and secondary efflorescence control, improved primary efflorescence control, enhanced color vibrancy, and increased strength performance. Rheopel Plus admixture also exhibits excellent wind-driven rain resistance and improved material flow and extrusion characteristics.

For more information, circle 80 on the Reader Service Card.

New moons

The Moonlight glare-free lighting systems from Multiquip Inc. are balloon lights that fly fan-free.

The balloon inflates in seconds and a simple plug maintains air pressure and protects the glare-free white light. Without a fan blowing air into the balloon, dirt and other debris stay out too, extending balloon and component life while maximizing productivity. The Moonlights, which rise to a maximum height of 10 feet, are available in 150-watt, 400-watt and 1,000-watt outputs and effectively illuminate areas up to 100 feet from the light source. These lighting systems feature bulbs that last up to 10,000 hours and durable water-resistant PVC balloon material. They're also stable in winds of up to 55 mph. The units come in pushcart, wheeled stand and tripod stand configurations.

For more information, circle 81 on the Reader Service Card.

The power of enzymes

BioKleen, from Kleen-Sales, uses the latest in enzyme technology to provide a safe and effective industrial-strength solution to mold and mildew removal. In one application, BioKleen cleans, removes stains, abates odors, neutralizes pH, removes mold and mildew at the molecular level and keeps it from coming back for up to one year.

BioKleen is 100 percent biodegradable and 100 percent bleach-, ammonia- and phosphate-free. Unlike many enzyme cleaners that become unstable and lose effectiveness as they age or are exposed to the air, BioKleen is formulated with more stable enzymes, making it more effective and easier to work with. In addition, BioKleen is composed of an advanced cleaning surfactant formula that cleans with results that are visible almost instantly.

For more information, circle 82 on the Reader Service Card.

The power of forever

AVM Industries inc. has introduced two fluid-applied waterproofing solutions for decks: Elasto Fiberdeck 100 Forevercoat and Elasto Fiberdeck 100 Lastcoat.

Forevercoat is similar to AVM's Elasto Fiberdeck, but with a wear surface that never requires recoating. The surface is made of 6,200-psi polymerized cement and comes in 30 colors. It's commonly used as a replacement for hard-rock deck systems.

Lastcoat is a maintenance-free deck coating for upgrading existing deck coating installations. It takes only one day to install and offers the same tough wear surface and color selection as Forevercoat. It can be used on both cement-based and water-based decks.

For more information, circle 83 on the Reader Service Card.

CD

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The natural world … cast in place

Artist and designer Linda Patterson of Newark, Calif., created 15 cast-in-place relief murals — 2,136 linear feet in all — to adorn underpasses along the 12.8-mile San Tomas Aquino/Saratoga Creek Trail in Santa Clara County, Calif. The $22 million recreational trail passes beneath state highways, rail corridors, expressways and city streets.

The murals are 12 feet wide and vary in height from 2 feet to 6 1/2 feet. Patterson first sculpted each mural in clay with 1 1/2-inch relief.

When the artwork was complete, form liner-manufacturer Scott System, Denver, Colo., used liquid urethane to create elastomeric form liners from the sculpted clay. The form liners were then attached to boards and shipped back to Santa Clara, where contractor J.J. Albanese Construction poured the concrete in place for the retaining walls.

The murals are representative of the flora and fauna found in the area, and all the animals and birds are full size. **CD**

To see a slide show with more detail from the mural, visit www.concretedecor.net and click on "Final Pour."
Visit Linda Patterson at www.lindapattersondesign.com

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