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THE JOURNAL  
OF DECORATIVE  
CONCRETE

concretedecor.net

Placing Concrete  
with Acid Stain in Mind pg. 38

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Vol. 13 No. 8 November/December 2013

## Metallics Take Over

Decorative coatings  
dominate this show home

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# FROM THE editor's DESK

## Dear Readers,

Winter's just around the corner, and if you've sold your clients on radiant heating systems in their decorative concrete patios, sidewalks and driveways, they are well prepared.

The value of radiant heating is one of the lessons enterprising concrete installers are trying to teach their customers these days. We feature some of those installers in this issue's feature story on radiant heating systems in decorative concrete flooring.

More and more, the art of decorative concrete is all about the complete package. You're not selling concrete, you're selling a house or a backyard. The good news is this gives you more opportunities to make money by upselling amenities such as radiant heat. The "bad" news is that in order to capitalize, you may find yourself taking on entirely new fields of work, such as landscape design. Or, perhaps, even general contracting. After all, the most efficient way to insure quality decorative concrete throughout a house is to simply build the house.

Speaking of change, there are big changes afoot here at Professional Trade Publications, the little company that publishes *Concrete Decor*. We would like to welcome a new sales representative: Todd Rylands, who is based in Florida and will serve our customers in the South.

At the same time, we'd like to say goodbye to longtime sales representative Donna Flood and assistant editor Emily Dixon. We thank both of them for superb service over the years and we wish both of them the very best of luck.

On a sadder note, our longtime sales representative Troy Ahmann has suffered a serious stroke, as many of you already know. We are praying and hoping for his recovery. Troy's family is asking for help to cover the costs of his treatment, and you can find more information about that effort on *Concrete Decor*'s Facebook and Twitter feeds.

Sincerely,



John Strieder  
Editor



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## concrete DECOR®

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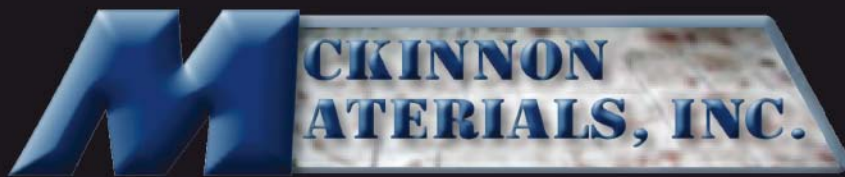
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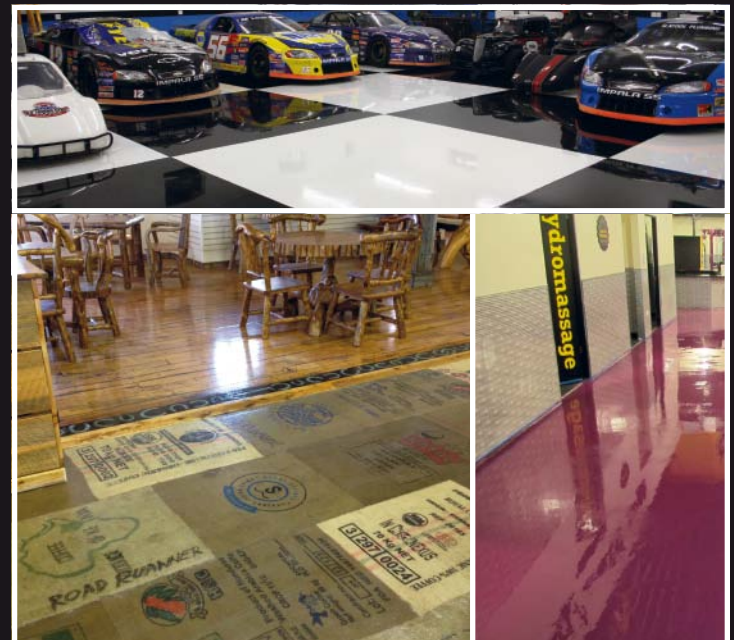
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*by Steven Ochs*



**On the cover:** Polished concrete floors weren't quite the right fit for this unique contemporary home near Boise, Idaho. Silverline Systems introduced the interior designer, architect and client to Westcoat Specialty Coating Systems' Liquid Dazzle. It was a unanimous hit, and Silverline Systems installed the metallic epoxy on every floor in the home, which totaled 5,200 square feet. For more, see page 32.

Photo courtesy of Silverline Systems





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# concrete DECOR® EXPERTS



**Doug Carlton** is working on his third decade in the decorative concrete industry. He's the owner of Carlton Construction, located at the base of the Big Horn Mountains in northeastern Wyoming. Doug can be reached at [carltondoug@sbcglobal.net](mailto:carltondoug@sbcglobal.net). See Doug's column, "Carlton's Corner," on page 54.



**Mark Celebuski** is a partner at Trinic LLC, a company that offers protective solutions for concrete, stone and tile. He can be reached at [mark@trinic.us](mailto:mark@trinic.us). See Mark's article on page 36.



**Nick Dancer** has been active in the concrete construction business since 2005 and started his own company, CounterCrete, in 2007. That company grew into Dancer Concrete, which is based in Fort Wayne, Ind. Contact him at [nick.dancer2@gmail.com](mailto:nick.dancer2@gmail.com). See Nick's article on page 38.



**Heidi Hudnall** is marketing coordinator at Runyon Surface Prep Rental and Supply, an Indianapolis-based distributor of flooring products for prep, polishing and removal. Reach her at [heidi@runyoncompanies.com](mailto:heidi@runyoncompanies.com). See Heidi's article on page 52.



**Dan Knuth** is a flooring equipment expert at Runyon Surface Prep Rental and Supply. He can be contacted at [dank@runyonsurfaceprep.com](mailto:dank@runyonsurfaceprep.com). See Dan's article on page 52.



**Chris Sullivan** is vice president of sales and marketing with ChemSystems Inc. He has led seminars and product demonstrations throughout North America. See Chris' column, "Concrete Questions," on page 56.



**Peter Wagner** owns Concrete Flooring Solutions LLC. He works with installers, manufacturers and specifiers to provide industry-specific and system-based solutions. A former polished concrete contractor, he has provided marketing, training and consulting services for the past 13 years. He may be reached at [pbwagner@concreteflooringsolutions.net](mailto:pbwagner@concreteflooringsolutions.net). See Peter's article on page 50.

**Talk back! Weigh in online at [ConcreteDecor.net](http://ConcreteDecor.net)**

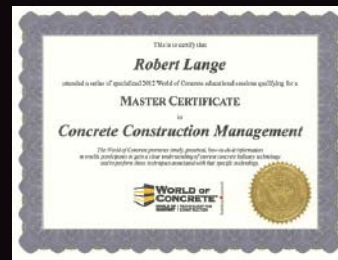




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## INDUSTRY NEWS

### Pullman Ermator acquires vacuum business of Pullman-Holt

The Swedish company Pullman Ermator AB, a leading manufacturer of dust extractors and a leading player in the vacuum and air scrubber industries, has acquired Pullman-Holt's HEPA business and models as well as wet and dry vacuums related to the HEPA vacuum models. Along

with the product lines, Pullman Ermator has acquired the rights to the trademarked name Pullman-Holt and PHC.com. This Pullman-Holt division will be managed by Pullman Ermator's United States subsidiary, Ermator USA.

For the past nine years, Pullman-Holt has been owned and controlled by Ron Underwood, who also owns the Canadian

companies Michael's Equipment Ltd. and Advantage Maintenance Products Ltd. Underwood will continue to sell the remaining Pullman-Holt products to the janitorial and sanitation market and will transition to a new brand name.

[www.ermatorusa.com](http://www.ermatorusa.com)

[www.phc.com](http://www.phc.com)

### Concrete writer-editor Hurd dies

Mary "M.K." Hurd, one of the most influential writers and editors to specialize in concrete, passed away in September at age 87.

Hurd is best known for writing every edition of the American Concrete Institute's "Formwork for Concrete, SP-4," considered the definitive book about structural concrete practices. The first edition was published in 1963, and the book is in its seventh edition today.

Hurd also served as editor in chief and engineering editor of Concrete Construction magazine and was a frequent contributor to the publication.

Hurd received many awards, including ACI's Construction Practice Award, and she was the first woman to receive the Anson Marston Medal, the highest award bestowed by Iowa State's College of Engineering. She was also a member of ACI Committee 124, Concrete Aesthetics.



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## event calendar

### World of Concrete

Jan. 20-24, Las Vegas

[www.worldofconcrete.com](http://www.worldofconcrete.com)

### CONEXPO-CON/AGG

March 4-8, Las Vegas

[www.conexpoconagg.com](http://www.conexpoconagg.com)

### American Concrete Institute Spring 2014 Convention: "Concrete Endures"

March 23-27, Reno, Nev.

[www.concrete.org](http://www.concrete.org)



## Marketing guru Cabrera passes away

Rafael A. Cabrera, a well-known marketer and consultant specializing in decorative concrete companies, passed away in October.

Cabrera founded his marketing firm, Tools for the Capitalist LLC, in 2002, and was a highly visible presence in the decorative concrete industry, helping manufacturers such as Brickform and Proline Concrete Tools learn how to promote their products in the marketplace. He founded JoeCrete.com in 2012 to launch a group of new decorative concrete products.

By taking the lead in imparting marketing and business skills to people in the decorative concrete industry, Cabrera played an integral role in making decorative concrete what it is today.



## ASCC DCC publishes sealer guide

The Decorative Concrete Council, a specialty council of the American Society of Concrete Contractors, has published the Sealer Selection & Application Guide and a Sealer Installation Checklist. The publications are available to ASCC DCC members via the association's website.

The Guide focuses on acrylic film-forming sealers in solvent- and water-based forms. It is written to help concrete contractors and others understand the concrete sealing process. A troubleshooting section, with color photographs, includes types and causes of failures and suggested corrective action.

Also covered in the Decorative Concrete Council's guide are product selection, gloss level and color enhancement, performance expectations and maintenance, safety, application, VOC laws and a glossary.

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## Contractors recognized for safety

Concrete contractors with exemplary safety records for 2012 were recognized by the American Society of Concrete Contractors at the association's annual conference. W. Burr Bennett Awards for Safety Excellence were given to specialty contractor T.A.S. Commercial Concrete Construction, Houston, and general contractor T.B. Penick & Sons, San Diego.

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## New CSDA standard and best practice documents for polished concrete

In response to requests by architects and engineers to resolve consistency issues associated with quality levels of polished concrete surfaces, the Concrete Sawing & Drilling Association has released two technical documents — an industry standard and a Best Practice.

CSDA Standard ST-115 Measuring Concrete Micro Surface Texture uses surface texture instead of gloss to evaluate polished concrete. A collaborative effort between the CSDA Polishing and Standards & Specifications Committees, it identifies approved instrumentation for measuring surface texture and provides a benchmark measurement procedure for contractors and specifiers to follow. The document covers important steps in the production of a quality polished floor and gives useful guidelines associated with the testing and inspection of a finished concrete surface. In addition to all this, CSDA-ST-115 includes a standard process for documenting surface texture readings, a list of industry terms and definitions, and a section on codes, symbols

and charts to assist concrete polishers.

The accompanying Best Practice, CSDA-BP-015 Green Polishing and Grinding Practices, has been devised to help concrete polishing and grinding contractors create a detailed plan for performing their work in a more environmentally friendly manner. It provides guidelines and recommendations for companies to employ on the job site, in the office or in the shop.

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## Concrete Decor announces new hire in magazine sales force

*Concrete Decor* has hired a new representative to its magazine sales force to replace outgoing rep Donna Flood, who has accepted a position elsewhere.

Covering the South is Todd Rylands, (407) 467-2758, from Windermere, Fla.

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## 2013 EPIC event was a transcendent networking experience

by Jeremy French, director of business development, BLUEconcrete and Buddy Rhodes Concrete Products

**W**HAT happens when 40 concrete artisans are assembled in one place with the task of creating 10 world-class concrete cornhole platforms? The good folks at BLUEconcrete decided to answer this age-old question once and for all. In October of 2013, artisans from all over the planet gathered at the facilities of BLUE in Covington, Ga., for the third annual EPIC networking event.

This year's event was anchored by 10 of the most respected artisans in the trade, each of whom was tasked with designing a cornhole platform to be cast at the three-day event. EPIC ended with a cornhole competition, taking place on the new platforms, between the 10 fearless leaders' well-trained teams of cornhole experts. (If you are wondering just exactly what I mean by "cornhole," think "bean bag toss.")

Those attending were able to participate in the casting of these platforms, 10 different 3-D objects cast using 10 different processes and mix designs. There were demonstrations of products and techniques. There was hands-on sealer training. There was plenty of food and spirits, including two very happy pigs roasted to perfection over the whole of Saturday. There were competitions, and there were champions. The times that enjoyed the greatest fanfare were round-table discussions held on Thursday and Friday night discussing issues pertinent to artisan concrete. All of this was accompanied by an appropriate amount of debate, debauchery and laughter.

The event surpassed the sum of the experiences within it, so much



Dusty Baker (second from left) and his team show off the award-winning wheeled cornhole board they made at BLUEconcrete's 2013 EPIC event.

so that description is confoundingly difficult. Just as the experience of working with concrete is often transcendent for the artisan, so too is the experience of working with concrete alongside such a talented group of artisans.

Was it training? Kind of. Was it a competition? Yes. Dusty Baker (Stone-Crete Artistry, Burns, Tenn.) won all of the various competitions for the event. The guy was on fire.

Was it a social event? Yes. Was it an opportunity to see the latest and greatest in concrete materials and techniques? Absolutely. But it was also more than that. At the end of the day, it was EPIC.

See it as it went down by searching #blueepic on Instagram.

## GranQuartz opens Seattle location

GranQuartz recently opened a new store in Seattle. The location offers 11,000 square feet of warehouse and showroom space, and it will offer one-day shipping to the state of Washington, northern Idaho, and parts of Oregon.

The new store is located at Northwest Corporate Park, Building B, 6001 Sixth Ave. South, Seattle. It is one of 12 GranQuartz stores located across the country.

☎ (800) 458-6222

🌐 [www.granquartz.com](http://www.granquartz.com)

## WerkMaster moves to larger facility

WerkMaster has moved to a much larger facility in Burnaby, British Columbia. The new location will provide expanded production capacity to meet growing global demand for WerkMaster's floor care equipment and maintenance products.

The new street address for WerkMaster Grinders & Sanders Inc. is 6932 Greenwood St., Burnaby.

☎ (800) 373-9375

🌐 [www.werkmaster.com](http://www.werkmaster.com)

## WarmlyYours sales grow

WarmlyYours Radiant expects a strong fourth quarter after posting a record 25 percent increase in overall sales for the quarter ending Sept. 30, 2013, as compared to the third quarter of 2012. Sales for the month of September were up 39 percent over the previous year. These results are especially significant considering that the summer months are typically the slowest for the radiant heat industry. With such dramatic growth so early in the season, WarmlyYours predicts extremely strong sales going into 2014.

WarmlyYours Radiant showed substantial sales gains in the United States across its major product lines: floor heating, snow melting systems and towel warmers.

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## NEW faces

**Jeff Bishop**, precast division manager, Nox-Crete Products Group

**Brian Farnsworth**, general manager of operations, Cement Colors Inc., a division of ChemSystems Inc.

**John Forewell**, territory sales manager, Laticrete Supercap

**Nick Fox**, sales representative, Ermator USA

**Donnie Milz**, surface preparation specialist for the Southeast, Husqvarna Construction Equipment

**Todd Rylands**, South sales representative, Concrete Decor

**Ryan Yonkers**, district sales manager for Ohio, Husqvarna Construction Equipment





## Pool supply wholesaler commits to decorative concrete

At the annual conference of pool supply leader Poolcorp, recently held in Dallas, Texas, company executives announced that Poolcorp has made it a priority to become the largest and best supplier of decorative concrete supplies in North America through its network of strategically placed locations.

The announcement was received by more than 1,100 field and store managers who had met for education, strategic planning and networking with peers. According to its website, Poolcorp is the world's largest wholesale distributor of swimming pool supplies, equipment and related leisure products. Poolcorp sales centers have been selling decorative concrete supplies for almost a decade, but the announcement reflects a new emphasis on the industry.

Poolcorp networks that will be carrying decorative concrete materials include National Pool Tile, a leading wholesale distributor of pool tile and component pool finishes, SCP Distributors, and Superior Pool Products LLC. While not all 300-plus Poolcorp sales centers will be offering these products immediately, some 80 sales centers are now making room for more stock. Also, NPT Design Centers will now highlight decorative concrete options.

The increasing availability of these building materials is key evidence of the decorative concrete industry's progress. Availability in the marketplace enables decorative concrete contractors to become increasingly competitive and levels the playing field with other trades. 

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## PRODUCT NEWS

## COATINGS

**An epoxy moisture mitigation system**

Dependable LLC has introduced an epoxy moisture mitigation system.

Vaporseal-HM is a new, 100-percent solid epoxy moisture mitigation system for concrete slabs. Vaporseal-HM is a high-performance product treating areas where the relative humidity is up to 100 percent

and has a perm rating of 0.06. Vaporseal-HM comes as a two-part kit including a lid with a spout for easy pouring and mixing. The kit can cover up to 700 square-feet of surface.

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**Versatile improves 5073 Polyurea**

Versatile Building Products has improved its 5073 Polyurea. The high-solids, fast-setting polyurea is now thinner, dries faster, and has a longer pot life. Viscosity levels have also been reduced.

Versatile's 5073 should only be used in well-ventilated areas. It can be used as a topcoat over decorative concrete projects such as stained concrete, microtoppings or stamped concrete.

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**New vapor-resistant epoxy primer from Concrete Solutions & Supply**

Concrete Solutions & Supply has announced CRP-8515, a two-component, 89 percent solids, low-viscosity, moisture-accepting epoxy primer.

CRP-8515 has excellent adhesion to concrete and largely reduces moisture vapor transmissions emitted from a concrete substrate. It can be used to prime concrete, wood or metal with corrosion inhibitors added.

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## COUNTERTOPS &amp; CAST CONCRETE

**Smooth-On's "no vacuum" rubber**

Smooth-On has introduced its Mold Max 14NV, a "no vacuum" tin-cured silicone rubber.

Most high-tear tin-cure silicones require vacuuming the material to minimize air bubbles, a process that can be cost-prohibitive. Smooth-On's Mold Max 14NV is a high-tear strength tin-catalyzed silicone rubber that does not require vacuum degassing. It is measured 100A:10B by weight.

Mold Max 14NV offers a pot life of 45 minutes, and cure time is just four hours at room temperature.

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## GRINDERS

### A high-power cordless grinder

Milwaukee Tool is now offering the M18 Fuel Grinder, a high-powered cordless grinder that promises longer motor life, more run time, and better grinding, cutting and surface prep capabilities.

The M18 Fuel will be sold in a side-switch, lock-on model, as well as a paddle-switch, no-lock option. Both accommodate 4 1/2-inch and 5-inch wheels.

M18 Fuel Grinders effectively grind, cut and prepare surfaces. Each model offers speeds of up to 8,500 rpm and weighs just 5.8 pounds.

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### Angle grinder kit part of new tool line

Bostitch has announced the national launch of its new line of professional power tools, including corded and 18-volt cordless tools specifically engineered for today's contractors and the constant demands of the job site.

Part of the new line is a 7-amp, 4 1/2-inch angle grinder kit, which features a 7-amp motor and produces up to 11,000 rpm for aggressive cutting, removal and finishing of materials. A cast-metal gear housing dissipates heat during extended use.

For optimal control, this compact Angle Grinder is outfitted with a three-position side handle for a variety of cutting and grinding applications. The nonlocking paddle switch automatically shuts off the tool if the Angle Grinder is accidentally dropped during use. Additional features include a spindle lock and tool-free guard for quick and easy wheel and accessory changes and adjustments. The kit includes the small angle grinder, grinding guard, grinding wheel, cutting guard, cutting wheel, side handle, wrench and kit box.

This line also includes an 18-volt cordless drill/driver, 18-volt cordless impact driver, 1/2-inch hammer drill, 7 1/4-inch circular saw, orbital jigsaw, reciprocating saw and 3/8-inch corded drill.

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## LASERS



### Rugged rotating laser from Hilti

The new Hilti PR 2-HS Rotating Laser was built to withstand harsh job-site conditions while providing best-in-class leveling time. With this new tool, transferring heights, setting slopes or simple leveling are made easy with clearly defined function buttons.

With integrated Hilti Pulse Power technology, users will see readings with an accuracy of plus or minus 0.02 inch at 32.8 feet even under bright light conditions. The operating range for the new PR 2-HS is a 6-foot to 2,000-foot diameter with the included laser receiver.

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## OVERLAYS

### Self-leveling topping for restoring industrial and commercial floors

Dependable LLC's Wearflow is a self-leveler for restoration projects. A product suited for restoring degraded industrial or commercial concrete floor surfaces, Wearflow is cement-based with a wear-resistant top. It is high-strength and can be opened to high-traffic areas in as soon as 24 hours.

Wearflow is available in 50-pound bags and be poured as thin as 1/4 inch or as thick as 2 inches.

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## VACUUMS



### Ermator's propane-powered vacuum

Ermator has introduced the T8600, a new propane vacuum. The T8600 Propane has an 18-horsepower Kawasaki motor, made by American Onyx, with a direct-driven turbine. It achieves 410 cubic feet of air per minute and 115 inches of water lift.

All Ermator dust extractors include standard features that protect workers from hazardous dust and keep the environment clean, such as individually tested and certified HEPA filters. The T8600 Propane is built on the same model as the T8600 Dust Extractor, one of the best-selling vacuums for concrete grinding in the world. 🛠️

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# Taking Great Project Photos with Your Phone Camera

by Steven Ochs

**P**HONEOGRAPHY — or “i4neography” — is a term that has been around for a few years, and as you may have guessed, it pertains to photography via iPhones. As a professor of digital photography, I get annoyed when students ask if they can use their smartphones instead of a real camera. Still, I wonder if I should be teaching a course specifically for camera phones.

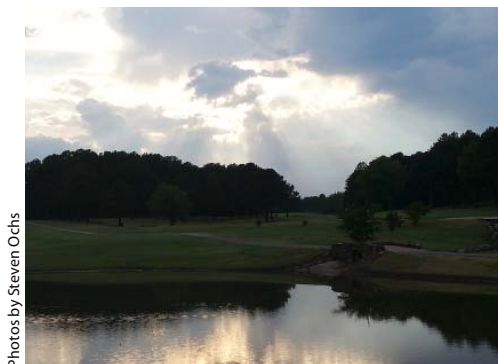
From film to digital to camera phones: In some ways, nothing has changed. If you understand how a camera works and you are observant of light, you can make almost any camera work for you. It's more important that the one behind the camera strives to capture what they believe is important so they can share that experience accurately with others. It's a balance between what you perceive and being proficient with the tools that record it.

Today, some phone designers have catered to the general public and dumbed down photography to the point where the only options you have are in the editing process. With other phones, if you don't know the mechanics of photography, you will never be able to take advantage of all the incredible control features available.

What does the rise of the camera phone mean for the readers of *Concrete Decor*? Have we reached a point where we no longer need cameras? The most difficult aspects of taking photos on a construction site are the brutal environment and how stopping to take photos distracts us from our work. Good cameras hate dust, water and extreme temperatures. They are expensive and using them well takes training and practice. Yet, you can say the same thing about cellphones and most of us still risk having them near us at all times.

Can smartphone cameras take photos that match the quality of digital SLR cameras with exchangeable lenses? No, not even close, but they are quickly improving. The new ones capture images that range from 8 to 13 megapixels (MP) in size, and they have virtually replaced the point-and-shoot camera. In any case, every photographer knows that your best camera is the one you have available.

In my opinion, the effort that goes into quality documentation of your finished



Photos by Steven Ochs



The photos provided were taken with a Samsung Galaxy S3 smartphone, then uploaded to Dropbox. Absolutely no edits or enhancements were made, so you can see the differences in photos taken with different settings.

**Top left:** Photo taken with “auto” setting. **Top right:** Exposure increased. **Bottom:** HDR mode.

work is just as important as the quality of the materials, tools and craftsmanship used to create it. The photos that you take away from a job will continue to promote future projects for several years to come.

What's more, we typically think of documenting only finished work, but even before you begin, a visual record of the entire site, the landscape and the nearby existing structures can be crucial to documenting the process of designing site-specific themes.

On some jobs, I have digitally superimposed suggested designs onto location photos so clients can better visualize the concept and how finished space will function. This is especially necessary for public art proposals that are reviewed by committees without your presence.

Regardless of what camera or smartphone you are using, here are some tips that you may find helpful in the documentation of your work.



## Lighting

While you are working on a job, try to notice what time of the day yields the most even lighting. In a 10-hour day, you may only have a 30-minute window to photograph. Avoid the worst-case scenario — hard or direct light and cast shadows intersecting the work. Soft lighting is generally the best.

If you want to accentuate the texture, photograph while the light source is low and from the side. Indoors, open the windows and doors to increase the ambient light. This will help reduce digital noise (the grainy effect) and blur from camera movement.

## Flash

Turn off your “on-camera” flash. Although the flash may travel 10-15 feet, the subject nearest you will be washed out in brightness and the background will “fall off” into shadows. If you are using a real camera with a “hot shoe,” you can attach an external flash that will enable you to direct the light into the ceiling or walls and bounce it evenly onto the floor.

## Depth of field

With regular cameras that have manual controls, you would want to decrease the size of the aperture to create the greatest depth of field in order to put as much in focus as you can. If your phone doesn't give you this option, a landscape setting (if available) can achieve the same effect.

## Reducing blur

Blur is caused by shutter speed that is too slow or by camera movement. The ISO setting is a light sensitivity rating — the lower the setting, the better the image quality — and a higher ISO will give you a faster shutter speed but may create digital noise. The antishake mode is also a very helpful feature that will help reduce blur in low-light shooting.

## File size

Set the resolution of your images as high as possible, at superfine quality. The large file is not necessary if you only want to post your images to Facebook, website, or email, but if these are images that you need to print or send off for possible publication in a magazine such as *Concrete Decor*, the larger the better.

## White balance

When possible, avoid multiple light sources. Each source of light has its own color. Shooting in shade or on a cloudy day will give you even, diffused light, but unless the WB is adjusted, the image will have a bluish tint.

## Two great shooting modes

For the most part, just single-shot/ auto mode with some adjustments to the exposure is all you need. But there are two other modes that are very useful. The first is HDR, or “High Dynamic Range.” The simple explanation is that when you take a photo of a subject that has a wide range of lights and darks, you usually have to choose which part is most important and adjust your exposure accordingly. With HDR, multiple shots are created simultaneously, then merged into one perfect image where every part of the subject and its background are correctly exposed. This technology is consistent with the way our eyes really see, and it used to be a manual process that required expensive photoediting software. It is so easy with smartphones.

Another shooting mode, which I find very helpful in better understanding a job

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site and its surroundings, is “Panoramic.” This mode has been around for a long time, but new software assists you with alignment grids as you accurately reposition each subsequent photo. On the Samsung Galaxy phone, once the image is perfectly lined up to the previous photo, the camera automatically takes the next picture. On the iPhone, the mode is similar to taking a slow continuous video. This used to require multiple photos, painstaking alignment on a leveled tripod, and considerable photoediting to “stitch” everything together.

### Choosing a brand

What are the better camera phones on the market? If you are already competent with a digital SLR camera, you will appreciate all the options and manual adjustments of the Samsung Galaxy S4 and S3. If you would rather take the shot and edit it later using a variety of apps, you may prefer others. In fact, some don’t even have settings — you must simply keep your hand steady and make sure there is enough light.

The HTC One, due to its large aperture and BSI (also known as back-illuminated) sensor, can handle low-light situations with

very little digital noise. It also has “extended depth of field,” which means everything in the photo will be in sharp focus. The iPhone 5, on the other hand, has one of the best HDR modes on the market.

### Attachments

Until recently, camera phones could only offer “digital zoom.” Without getting technical, “optical zoom” is what really counts. The way this is accomplished is through attachments. Here are a few options: the Olloclip 3-in-1 attachment for the iPhone enables wide-angle, fish-eye (180 degrees of imagery), and 10x macro. Others include the Photojojo Phone Lens Series and the Schneider Optics iPro Lens System for iPhone 5.

### Apps

Honestly, there are too many apps to mention, but I recommend that you look for an app that is the highest-rated one for the brand and model of your specific phone. The same app varies greatly from brand to brand. Personally, because accurate documentation is my goal, I stay away from all the gimmick filters and special effects.

Simple adjustments to color correction, light and dark, and crop are all I need. When editing is necessary, I forward the files from my phone to my email and open them up in Photoshop.

### Transferring your images

With regards to transferring photos from the cellphone to the computer, if you only need images for digital display, sending it to your computer as an email is fine. But if you need a full-size file (typically 8-13 megapixels), you will need to connect the smartphone via USB cable directly to the computer. The problem with emailing it to yourself is that most emailing apps will compress the file (throwing away pixels) to send it faster. The reason you would want to plug it in is to preserve full-size files suitable for quality prints or publication.

Some of you may want to upload photos that you have taken with a quality camera to your smartphone or tablet so you can easily share your portfolio with clients. That can be done by connecting your computer to your phone and syncing it with iTunes. Select the photo, then sync. Even easier, just store them in a remote online storage service such as Dropbox or Flickr so you can access them anywhere on any device. 📱

*Steven Ochs is a professor of art and chair of the art and design department at Southern Arkansas University, in Magnolia, Ark. He is also a public artist that creates decorative concrete murals and has been the events photographer for the Concrete Decor Show. Contact him at seochs@saumag.edu.*



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### Five Books that Will Help You Improve Your Camera Skills

“The Art of iPhoneography: A Guide to Mobile Creativity,” by Stephanie Calabrese Roberts

“The Camera Phone Book: How to Shoot Like a Pro, Print, Store, Display, Send Images, Make a Short Film,” by Aimee Baldrige, published by National Geographic

“Create Great iPhone Photos: Apps, Tips, Tricks, and Effects,” by Allan Hoffman

“iPhone Artistry,” by Dan Burkholder

“Sixty Tips for Creative iPhone Photography,” by Martina Holmberg





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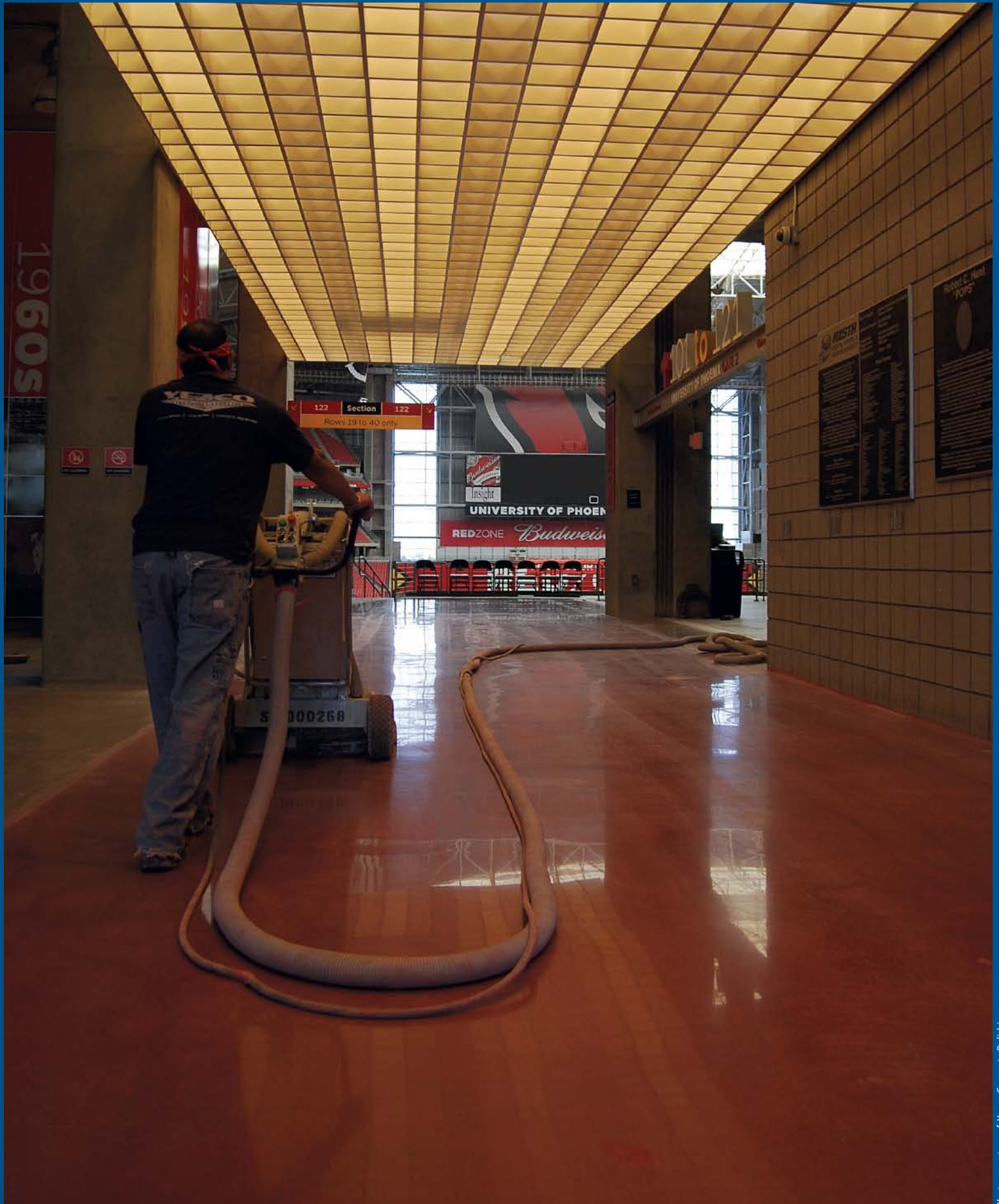
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Photos courtesy of Yezco Concrete Polishing



# ARTISAN IN CONCRETE

## Joe and Robert Yezzi, Yezco Concrete Polishing Phoenix, Ariz.

By Gail Elber

**A**T 31, Joe Yezzi was a construction guy trapped in the body of a cellular-phone tycoon.

After he finished high school, Yezzi started a pager company that grew into a chain of 23 stores selling wireless phones and services from all the major brands. “I had a street-smart education,” he says.

But the bigger his enterprise got, the unhappier he was.

“Being in retail, I was a prisoner in my own company,” Yezzi confides. “I had to be there from nine o’clock in the morning to six o’clock at night, Monday through Friday. There’s no life there. You’re stuck there unless you have employees who don’t steal.”

Liberating himself, he started Yezco — a company that, in just a decade, has grown into Arizona’s biggest concrete polishing contractor.

With Phoenix’s housing market booming 10 years ago, Yezzi looked around for a way to get into the construction industry, where his father had spent his career. He decided to enter construction through the garage door, doing floor coatings.

“My hobby was building Harleys and trucks,” he says. “I’ve always been interested to see what was in people’s garages.”

“There weren’t too many companies doing garage floor coatings, and it was a gratifying feeling when you were done. You were laying something down that you could be proud of.”

He spent the first year doing residential garage floors, working solo. “I was working out of my house, it was the perfect mobile business, there was no inventory to do, and nobody could steal anything from me,” he says.

“Then in ’06 or ’07, my cousin Robert came on, and he allowed me to work on my business instead of in it,” Yezzi says. “From that point on, we were able to blow up, really expand.”

Robert Yezzi does the estimates and manages the job sites, leaving Joe to handle the administrative aspects. “I stay on the computer, do the marketing, pay the bills and oversee it,” Joe Yezzi says.

Around that time, the Yezzis perceived that polished concrete was poised to replace the epoxy coatings that they’d been doing. “We invested heavily, purchased almost half a million dollars in equipment, and never looked back.”

They learned polishing by attending World of Concrete and learning from suppliers and “people we knew,” Yezzi says. As jobs came their way, they bought larger equipment.

“We learned quickly we didn’t want to be in residential,” he says. “I’d rather chase one check a month than 25. It was an accounting nightmare, going around collecting checks and signing contracts. Once you get a taste of one big job a month, you want to stay there.”

Yezco started winning bigger and bigger

projects. Now, what Yezzi calls “the biggest of the big jobs” — military facilities, stadiums, schools and municipal facilities — are its bread and butter.

Yezco currently employs nine people. To fill out a crew, which may number as many as 30 on a big job, the company hires temporary staff.

Yezzi takes pride in his crews’ image. “They call us ‘NASCAR’ when we pull up,” he says. “We’ve got the 35-foot trailer all wrapped (in graphics). Everybody’s got the same shirts on, tucked in, real clean.

“You get a system going. They want you back. The relationships we have with these people are incredible.”

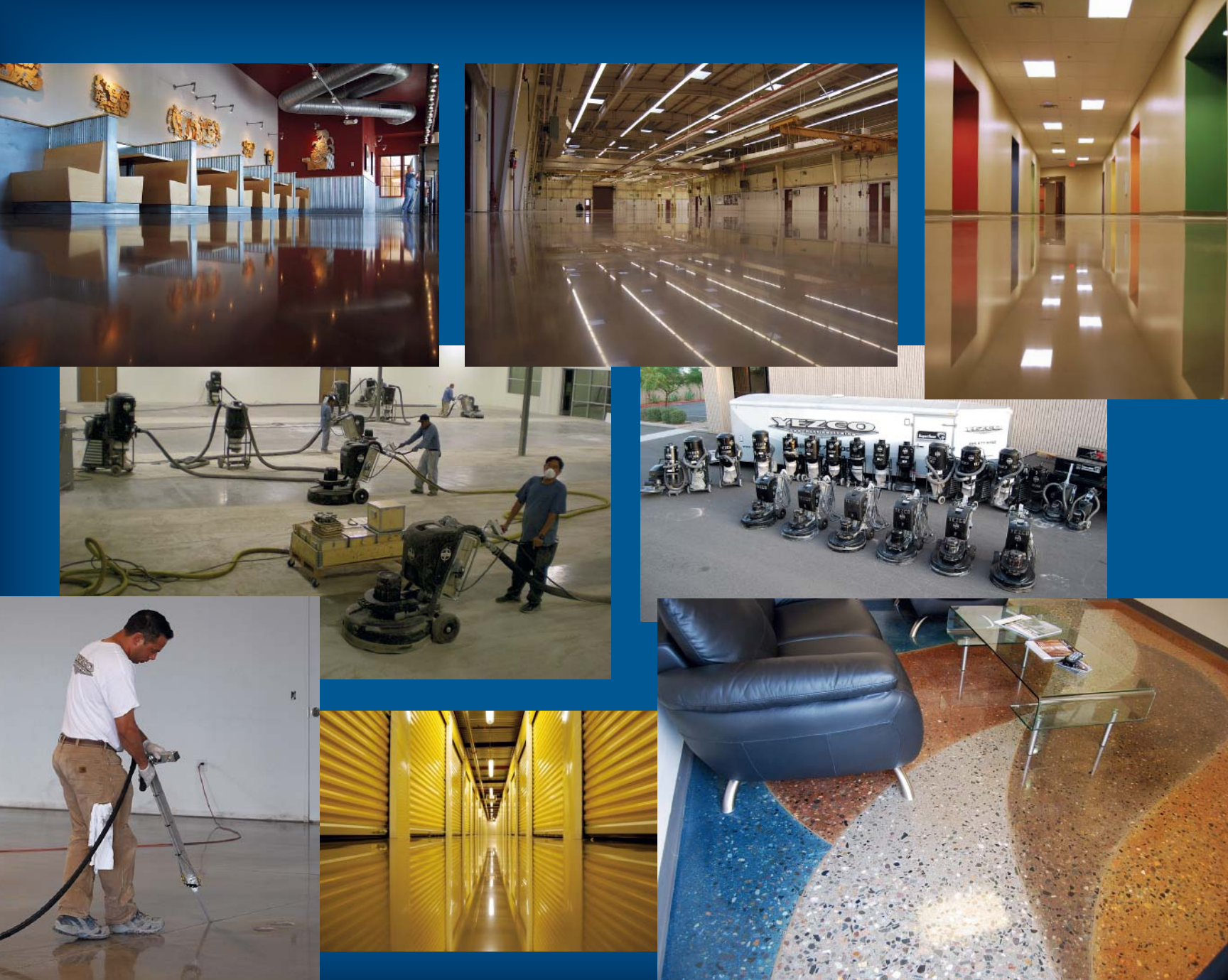
### Super Bowl and super planes

One place Yezco will be coming back to for a long time is the University of Phoenix stadium in Phoenix, where Yezco is polishing a million square feet of concrete.

Seven years after construction, the stadium’s floor coatings had failed, unable to withstand the attacks of beer, jalapeño juice, harsh cleaners, and crowds of more than 63,000 at Arizona Cardinals games.

“They hired us to recoat it,” Yezzi says. “We did a sample with AmeriPolish and said, ‘This is a much better system for what you’re doing.’”

University officials agreed and hired Yezco to polish the whole facility with the goal of having it done by the time the



stadium hosts the Super Bowl in 2015. Yezco's crew leaves its equipment in the stadium and works on the floors between events. Section by section, they grind off the epoxy coating, polish the floor and dye. "We've been in and out of there for the past three years," Yezzi says. "We have one year left."

Another vast project Yezco is working on is a series of 30,000-square-foot hangars at Luke Air Force Base that will eventually accommodate 144 F-35 jets slated to replace the base's contingent of F-16s.

"Years ago, we did all the F-16 hangars. But to put the F-35 in there they have to retrofit the hangar, because it's a bigger plane and it's maintained differently. So we literally have to redo everything we

did three years ago, and they're building a bunch of new hangars."

Part of the project includes stenciling outlines of each plane on the floor to help maintenance staff position them. "We're dyeing it with AmeriPolish, and it's difficult to get the measurements laid out perfectly."

Working in the hangars can be stressful. "We're right off the runway where these things are taking off all day," Yezzi says. "You're smelling jet fuel, you've got earplugs in." Employees need a security clearance and can't use cell phones in the hangar.

Another project Yezzi is especially proud of is the rental car center at Sky Harbor Airport in Phoenix. "It was a 40,000-square-foot area of concrete under awning that was

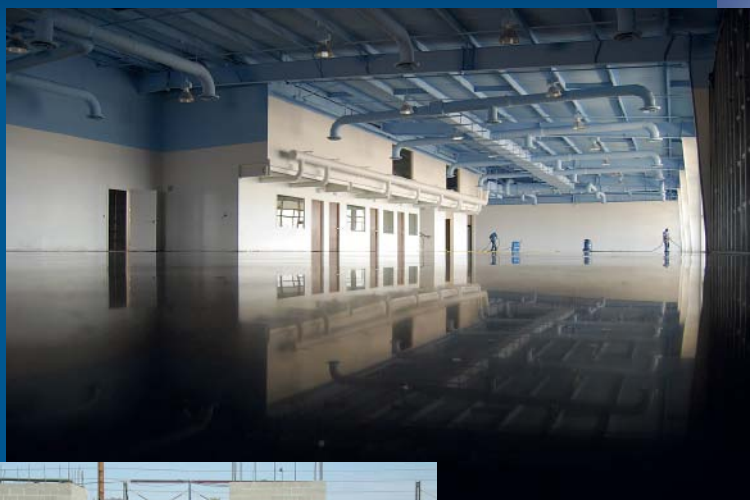
just literally falling apart," he says. "It was carbonated really bad on top, the aggregate was starting to come through, and the top was so soft it was like chalk. They were considering ripping it out and replacing it." That would have cost more than a million dollars, Yezzi recalls.

"We said we could fix that. We ground it down, took all that carbonation off, exposed the aggregate, densified it like six times with lithium silicate, hardened the surface, and brought it up to 400 grit. Now it looks like dull terrazzo. We saved them a bunch of money, and they were super-happy."

### Capping growth

To keep its operations manageable,





Yezco turns down work outside Arizona. "One of my friends told me, 'Stay within a certain range that you can get to in an hour or two, and don't get greedy,'" Yezzi says. "That proved true when we tried to go out of state. It was a disaster. Snow, ice, broken-down trucks — it wasn't worth it."

Franchising the business was another idea that didn't pan out. "At one point, we were going to franchise out the coatings business, right before the housing market fell apart," Yezzi says. "We were ready to go, and we had a bunch of clients who were interested in franchising it all across the country, and even in Dubai. Right before we pulled the trigger, I said, 'It looks like the market is tanking, and if we get stuck

with a bunch of franchisees, it's going to be hard to satisfy them.' We didn't want to put franchisees in a bad market. So we canned the idea."

Since the company turned its focus from coatings to polishing, it has benefited from an alliance with a Phoenix coating systems company called ZonaCo. "They do all the coatings and self-leveling products, and we do all the removal for them," Yezzi says. "All our coating business goes to them. They are the only coating company we have confidence will do the same quality of work we do."

Yezco now includes maintenance in its services. "We maintain the work we do," Yezzi says. "Janitorial companies come in and

don't understand how to maintain a polished concrete floor. They put down an acidic compound and etch the floor and ruin it. So we prefer to go in there and get contracts to maintain these floors for less than what the janitorial companies are doing it for so we can keep our name looking good."

When he envisions the future, Yezzi says he'll be happy if the company just keeps doing what it's doing. "We're blessed," he says. "We don't go out looking for the work — it pretty much comes to us now."

"Things really get easy in your 10th year," he says. "Two years, you make it. Five years, it's always a hump. But once you're in your 10th year, there's a huge difference."

[www.yezco.com](http://www.yezco.com)

# CONTRACTORS WARM UP TO RADIANT HEATING SYSTEMS



Michael Frost of Vermont Eco-Floors, of Charlotte, Vt., created the polished exposed aggregate finish on this heated floor. The contractor was BauHeim Builders, based in Colchester, Vt.

Photo courtesy of Vermont Eco-Floors

by Gail Elber

**I**n wintry areas of North America, heated walkways and driveways that melt snow have been a prized feature of upscale homes and businesses for decades. Indoors, radiant-heated floors have long been an amenity in high-end homes, and new technology makes them a worthwhile investment in starter homes, too, since they can reduce the cost of heating the house.

Alliances between decorative concrete contractors and heating contractors can add value to both businesses. Why not offer customers floors and hardscapes with all the

benefits of decorative concrete and hydronic heating?

A hydronic systems designer and three decorative contractors talked with *Concrete Decor* about how those partnerships work for them.

## What's the difference?

Hydronic radiant heat systems circulate a heated solution of glycol and water through loops of cross-linked polyethylene (PEX) tubing under a floor. The water is usually heated in a dedicated boiler, which may be





Hydronic tubes solve the problem of removing snow on steep driveways, such as the driveway at this Salt Lake City house.

Photos courtesy of Harris-Dudley Co.

gas, electric or solar, depending on the climate. Other radiant heat systems heat the slab with electric wires instead of liquid.

A plumber or electrician must design the system and make the connections, but some regulatory jurisdictions allow the concrete contractor to lay out the tubing or wires.

Once the concrete has been poured over the tubing, the slab is finished just as any other indoor or outdoor floor. The buried tubing will not change the processes of troweling, stamping, coloring, sawing or polishing.

## Benefits in snowy climates

Bob Dudley, of radiant heating contractor Harris-Dudley Co., Salt Lake City, has been designing snowmelt systems for about 25 years. "It's definitely a high-end item," he says. "We see more residential, but there is a strong commercial component."

His company specifies hydronic systems from Uponor North America. The systems are controlled by temperature and moisture sensors and are designed to melt the snow as it falls.

"The radiant and snowmelt industry believes that concrete lasts longer in driveways when you have a snowmelt system because you eliminate the freeze-thaw cycles," he says. Also, "There are no blades and no scraping."

What about when the customer wants a decorative finish too? "We often recommend a concrete contractor, and then he gives the homeowner options on borders, colors and patterns. There are times when a homeowner will independently call the contractor, but we'll often get involved in a

little package deal."

Dudley prefers that concrete contractors not lay out the tubing, but he suggests that decorative contractors form relationships with the mechanical contractors or plumbers who design radiant heating systems. "Oftentimes, I will give a concrete contractor leads, and he will give me leads, and it works for both of us."

## Laying their own tubes

Architectural Concrete and Design, a Bomanite licensee in Draper, Utah, does hydronically heated concrete floors,

walkways and driveways in Park City, a ski resort community where many homes are 8,000 feet above sea level and can get as much as 300 inches of snow a year.

"We added it to our repertoire 20 years ago," says Devin Johnson, vice president of the 40-year-old company. "We get a lot of calls for heated driveways, and we wanted to be able to provide that. It eliminates the middleman."

Johnson's company usually gets the work via a general contractor who has contracted out a hydronic or electric heat system. He works with Warmzone LLC, a radiant



Sensors control the temperature of the walkway at this Park City, Utah, house so that snow melts as soon as it hits. Eliminating freeze-thaw cycles and reducing damage from shovels helps concrete slabs last longer in cold climates.

Photo courtesy of Architectural Concrete and Design





Before Reuben Keim's Ohio-based crew poured a 25,000-square-foot slab for a commercial building in October, a plumber laid out this hydronic tubing on Crete-Heat, a foam board with knobs that hold the tubing in place. Reinforcing mesh is laid over the tubing.

heating company based in Draper. Johnson prefers to have his employees place the tubes or wires themselves, subcontracting a certified plumber or electrician to make the connections.

"We terminate the wires or tubes to a certain area, and the electrician or plumber will take them from there to a junction area, where they will run them to the control panels. The boilers and panels are generally in the garage.

"The heat system is always attached to some kind of welded wire mesh or rebar grid to hold it in place and give it strength. We lay an insulating membrane below the subgrade to enhance the heat. Then we lay down our rebar grid and welded wire mesh on top of that. The heat tubes are tied to that system, and the rebar grid and tubing is chaired up on adobes to get it up into the middle of the slab."

Johnson uses a boom pump to place the concrete without dislodging the tubes. For indoor applications, 2 inches of lightweight gypcrete are poured over a wooden subfloor, and the gypcrete is then covered with floor coverings or a decorative concrete overlay. Exterior slabs with heat systems are poured at least 4 inches thick with a standard concrete mix.

### Who's buying?

Reuben Keim, owner of Keim Concrete in Wooster, Ohio, finds that his hydronic work is about half remodels and half new construction. "On a lot of our jobs, the house might be two or three years old, and they are adding a feature to it, like a patio," he says.

Generally, he gets his radiant work from homeowners. "It's not something that I really push that much," he says.

"Until the past two years, 80 percent of our stuff was interior floors, but we're seeing it shifting to outdoors," he says. He's done heated patios, so homeowners can let their dogs out in the winter, and heated walkways that give easy access to a hot tub.

Although Keim doesn't sell or design

hydronic heating systems, he does lay his own tubing, using a different method from Johnson's. He starts with two layers of 1-inch blue Dow foam insulation placed perpendicular to one another. Then Keim lays out the hydronic tubing, staples it down to the foam insulation, and lays #6 wire mesh on top of the tubing. "If you tie your tubes to your wire, then the wire is down flat on the bottom of the concrete and that's not good," he says. "When we cut our concrete, we're comfortable knowing that the tubes are lying flat on the Styrofoam."

Recently, Keim's crew tried something new: They poured a slab after a plumber had laid out tubing on a substrate of Crete-Heat, a foam panel covered with knobs that hold the PEX tubing in place. "I was very impressed with the way it worked," he says.

### Coming in from the cold

Decorative contractors can also find opportunities when radiant heating is installed indoors. Michael Frost, of Vermont Eco-Floors, Charlotte, Vt., has made a specialty of polishing hydronically heated residential concrete floors designed with different combinations of aggregates and sand.

Radiant heat under wood floors has long been popular in Vermont, but it's more efficient to heat a concrete floor. "This allows us to use lower water temperatures, which increases the efficiency of the heating system," Frost says. "When efficiency is increased, the size of the alternative energy system is decreased, reducing costs. The money is then available to increase



A WarmlyYours radiant heat system in the floors of this addition in Lake Bluff, Ill., offsets heat loss from windows. Work by Crossroads/Blue Sky, Lake Forest, Ill.





Photos courtesy of Davinci Pavement Design LLC

Michele Pondi-Salik, of Davinci Pavement Design LLC, Stratford, Conn., installed a Warmzone radiant heating system in this interior.

insulation, better windows and so on to maximize energy efficiency.

"On a cloudy day in January the new solar panels set for winter heating performance will make 75-degree water," Frost says. "In a well-insulated house, this lower water temperature is adequate to provide the required heat. Any leftover heat can be used to boost the domestic hot water."

Vermont Eco-Floors has been working with Vermont builders who are installing solar-heated radiant systems in starter homes. "While you may not be reducing the cost of building the house, you can reduce

the future heating bills for the homeowner or tenant," Frost says. The new generation of solar hot water systems are even more efficient than the old, with only a small amount of the glycol heating loop exposed to the cold weather.

A plumber or heating contractor installs the hydronic tubing and a concrete contractor pours the slab. Vermont Eco-Floors comes in afterward to do saw cuts and polish the floor. "We market through our website — and by meeting with architects and builders — ways to make these floors decorative using local

materials," he says. "The architect gets involved, and we give them the components to build their own floor."

Frost also has finished hydronic floors in basements, where they help heat the whole house, and in warehouses. In high-ceilinged industrial spaces, radiant floor heat keeps temperatures comfortable on the floor without wasting heat at the ceiling.

Frost praises the efficiency of these new heating methods. "The world is getting better every day. We are helping to reduce our carbon footprint, house by house," he says. 🚚

## [cov•er-up (n) *concealment or attempted concealment of a mistake or event, sometimes illegal*]



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## PROJECT PROFILE

# Metallics Glitter at Contemporary Show House

## The Manhattan, Eagle, Idaho

by Joe Maty

**T**HE unabashedly modernist home in the River's End community, in Eagle, Idaho, near Boise, is called a "stunning glass jewel box" in an Idaho builders association's 2013 Parade of Homes description.

The dark-hued, glistening floors could certainly be described as gemlike. Hitting pay dirt with this flooring creation was Silverline Systems, a Boise decorative concrete company with specialties that include coatings, overlays and stain-and-seals. The company used a metallic epoxy flooring system — Liquid Dazzle, from Westcoat Specialty Coating Systems — to deliver stunning visuals throughout the custom-built home.

The home, called the "The Manhattan," was designed with concrete floors and radiant heating on both levels, and the epoxy metallic flooring was installed on all 5,200 square feet — great room, bedrooms, kitchen, bathrooms, even the stairs and closets.

The homebuilder, Tradewinds General Contracting Inc., initially planned polished concrete floors, the preference indicated by the homeowners. But after looking at samples, the project team — Tradewinds, Silverline Systems and interior designer Mardie Reed-Engelhardt — agreed polished



Photos courtesy of Silverline Systems

wasn't the right fit for the home's striking contemporary design.

"We wanted more depth, movement," says Tyler Hess, president and CEO of Silverline Systems. "Polishing would be more uniform in appearance." And it would produce an earth-tone color, rather than a glamorous shade more suited to this contemporary abode.

Hess was hit with a sudden bolt of inspiration: He had recently seen a decorative epoxy flooring material that could well be an ideal match for the design theme of the Eagle home.

Early this year, Hess attended a demonstration event at a distributor company that offers products made by Westcoat Specialty Coating Systems. The



### Project at a Glance

**Client:** Private homeowner

**Decorative concrete contractor:** Silverline Systems, Boise, Idaho

**General contractor:** Tradewinds General Contracting Inc., Boise, Idaho

**Architect/designer:** Trey Hoff Architecture, Boise, Idaho

**Interior designer:** Mardie Reed-Engelhardt, Architectural Interiors LLC, Eagle, Idaho

**Mix design for concrete floors:** Sunroc Corp., St. George, Utah

**Project description:** Installation of high-build epoxy metallic decorative flooring system on concrete floors throughout home

**Materials used:** Westcoat Specialty Coating Systems' EC-12 epoxy primer in Stone Gray, EC-38 Liquid Dazzle epoxy in Graphite, and EC-95 clear polyurethane sealer

**Equipment used:** HTC 500 grinder

**Challenges:** Effective execution of application methods, including use of spikes on shoes, loop rolling, porcupine rolling and acetone spray.



demo event featured Westcoat's Liquid Dazzle, a metallic floor system billed as the company's premier decorative epoxy, engineered with proprietary metallic additives.

Silverline Systems prepared a small-scale version of the Liquid Dazzle floor — about 200 square feet — at its Boise showroom, Hess says. "As soon as I saw it, I knew it was the floor they had imagined," he says, referring to the owners and interior designer Reed-Engelhardt.

Sure enough, "as soon as they saw it, they said, 'That's it.'"

Designer Reed-Engelhardt calls the result spectacular. "The floor sets off the house in the most amazing way."

In a write-up for the Building Contractors Association of Southwestern Idaho, the home is described as having a "modern, moody and exceptionally chic" design of a type that might be encountered in New York City rather than Boise. Located near the South Channel of the Boise River, the home "blurs the lines between indoors and outdoors." It features white lacquer cabinetry, stainless steel architectural elements, sundecks, and terraces that "take

full advantage of pool, river and mountain views."

Tradewinds owner Steve Martinez says getting the homeowners association in

the River's End community to approve the home's modernist design presented a real challenge for the architects and builder. "For this area, you would have a better chance of

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seeing a UFO than getting this approved,” he says, adding that a conditional use permit was required. Homes in the area are generally a more typical prairie or ranch style, he says.

“You could put it (the home) in Malibu all day long, but for Idaho it’s out there,” Martinez says.

The home may push the design envelope in Boise, but the Building Contractors Association liked what it saw — the house earned a spot on the association’s Spring 2013 Parade of Homes, a showcase of new dwellings recognized for top-notch floor plans, designs and attention to detail.

The concrete floors feature radiant heating. Martinez says the builder and subcontractor trades must ensure they are in sync when radiant heating systems are part of the package. “You have to be dead-on with anything you’re doing on the concrete,” he says, as any damage to the system’s

water lines or wire mesh would present major repair headaches. “Everything has to be precise, and you can’t move a wall or add a plumbing line,” Martinez says.

He adds that Tradewinds takes photos of the construction process as part of a process to carefully record installation of the radiant-heat system. The photos can act as a guide to where subsequent saw cuts can be made or other issues may arise where cutting into the floor is needed.

### Application art and science

Silverline Systems employed a combination of etching with muriatic acid and spot grinding to prep the concrete surface for application of the Liquid Dazzle floor. The crew used an HTC 500 grinder with 40-grit diamonds in areas where the surface was not opened up adequately for optimal adhesion. Hess says the crew looked



for spots where the cream coat on the concrete surface remained visible, and they ground the surface to increase the exposure of aggregate as a salt-and-pepper look.

Caution was required in grinding, however, in recognition of the presence of the radiant-heating system. “You want to be careful because some of those coils could be near the surface,” Hess says. “You need to take it slow, and examine the surface ahead of time.”

A good deal of masking was required, as the selection and installation of the liquid flooring system occurred late in the construction process and other finishes were in place, including paint.

Installation of the flooring system began with roller application of a basecoat, using Westcoat’s EC-12 epoxy primer, tinted in Stone Gray to work with the finish coat. Following a 24-hour dry, the Liquid Dazzle was trowel-applied at a high-build thickness of approximately 3/8 inch. A notched trowel is used to spread the epoxy, and a loop roller is employed immediately after trowel application to enhance the visual effects of the finish. Backrolling in this fashion with the loop roller works to enhance distribution of the metallic content and “helps create that movement,” Hess says.

A final step with the epoxy system is rolling with a porcupine roller to remove





any bubbles that may develop. Silverline Systems also added its own twist with a light spray of acetone, which Hess says amps up the dynamics of the metallic finish. “We tried this with our own showroom floor and really liked it,” he says.

Silverline Systems also applied a sealer — Westcoat’s EC-95 clear polyurethane — to floor areas subject to sun exposure, Hess says.

In addition to the floors on both the first and second levels, Silverline Systems installed the epoxy metallic system to the home’s concrete stairs, a process Hess called ‘tricky.’ The steps were suspended on a metal structural framework — without risers — and constructed with cast-in-place concrete. The crew used duct tape to create a lip on the edges of the steps to facilitate application of the high-build epoxy.

### Color and effect

Mardie Reed-Engelhardt, the interior designer, calls Liquid Dazzle “a great fit for the project.” Reed, initially skeptical about the dark color and perceived slipperiness of the high-gloss surface, was quickly won over after seeing the installation get underway.

“It was amazing to watch,” she says. “It had a life to it. It moved.”

And concerns about slip proved to be unfounded, she found out.

“We walked on it, and found that it gets enough grit from use to where you don’t slip.”

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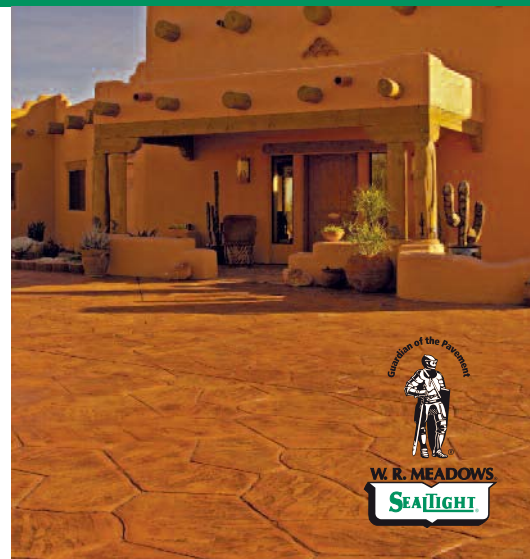
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# Why Strength Matters in Concrete Countertops

by Mark Celebuski

**H**ow strong do concrete countertops have to be? I hear that question from fabricators all the time. The answer is not a simple one. It depends upon how you define strength, what your intended use is and your sealer choice.

Let's first consider how you define strength. Standard wet-cast concrete's flexural strength is roughly 10 percent of its compressive strength. Compressive strength is strength when being crushed, and flexural strength is strength when being bent.

We ordinarily only hear about the compressive strengths of concrete. Compressive strength indicates the amount of force in pounds per square inch (psi) it takes to cause a sample to fail when being compressed. Flexural strength is strength in bending and is tested by making and breaking concrete beams. It's also measured in psi.

The first time I heard about flexural strength was when we were paving airport runways. I'm sure compressive strength was part of the equation but flexural strength was the important factor. You simply cannot gain a lot of flexural strength by making superstrong concrete. The difference in flexural strength between compressive strengths of 5,000 psi and 10,000 psi is only about 500 psi.

We have been able to raise standard wet-cast concrete's flexural strength to 20 percent of its compressive strength through the use of specialized additives, but this is the exception rather than the rule. Fortunately for us, someone has thought of other ways to increase flexural strength without resorting to compressive strengths of 100,000 psi. Internal reinforcement was developed. A low-grade steel bar yields about 30,000 psi (grade 30 rebar), while a high-yield prestressing strand will yield about 270,000 psi. Perfect glass fibers have strength of about 500,000 psi while glass windows have strength of about 7,000 psi, so as you can see there is quite a variation even among similar materials. To gain flexural strength, concrete countertop makers generally use a combination of fiber and steel in wet-cast concrete or glass fiber in GFRP concrete.

Why does your concrete need to achieve greater concrete strength?

## 1 For easier handling in the shop

You need to be able to strip and process your tops without breaking them. With either wet-cast concrete or GFRP, strengths of 3,000 psi are adequate for handling in the shop if you are careful.

## 2 To avoid warpage or curling

Curling occurs for a couple of reasons. One is faster moisture loss from one side of the piece than the other. The solution to this is simple: Hydrate more of the cement before you strip the piece. By the time you cross a strength threshold of 4,000 to 5,000 psi, enough of the cement has been hydrated to reduce the porosity of the concrete to the point where exiting water will not cause appreciable shrinkage. Remember density is directly proportional to strength.

Another cause of shrinkage is low-strength concrete being exposed to moisture, such as during polishing. Here, the porosity of the concrete is not low enough to prevent water from entering the pores and causing one side of the slab to lengthen.

The solution in both cases is simple: get the concrete stronger (and denser) before you strip it. How you accomplish this is up to you. I prefer to use heat while it's retaining moisture, to speed up the process and get things stripped sooner.

## 3 When polishing

When you are polishing concrete (to any depth) you need to be able to cut the sand grains rather than pull them out of the matrix. Dislodged sand grains get under the polishing pad, turning a 200-grit pad into a 10-grit pad. Your concrete will never take a polish if it's not strong enough. There are ways around this, such as densifying the surface prior to polishing. Another solution is to make stronger concrete, since the strength is also needed to solve other problems.

Concrete with standard aggregate needs to be about 5,000 psi to take a very high



This table was cast using a hybrid wet-cast mix containing steel and glass fiber for reinforcement.

Photo courtesy of Mark Celebuski

polish. Concrete with glass aggregate needs to be about 5,500 psi to take a decent polish.

## 4 For sealers

The majority of topical concrete sealers need a bit of penetration and a mechanical bond with the concrete in order to not delaminate. They will bond fine to 3,000-psi concrete polished to 200 grit. However, most will not bond to 15,000-psi concrete polished to 200 grit. Problems occur when fabricators using topicals decide to up the strength of their mix without regard to unintended consequences.

Concrete porosity is directly proportional to strength. Even if the surface of 15,000-psi concrete is honed to 200 grit, the lack of any penetration by most topical sealers may prevent good adhesion. I would not want to be the one telling a customer they can use topical sealer on 15,000-psi concrete polished to 3,000 grit. You've created a glasslike surface and now you're trying to paint it. (True penetrating sealers will work on just about any concrete.)

The introduction of nanotechnology



has solved a lot of the adhesion issues while creating others. There are sealers with nano-sized particles that actually require dense, high-performance concrete to perform. At Trinic, we make a sealer composed of particles measuring less than 1 nanometer (the definition of a nanoparticle). You could pour a gallon of this sealer on a sidewalk block and it would disappear, eventually wetting out the bottom of the slab. The concrete has to be very dense for this sealer to perform. It does not perform well on 5,000-psi concrete, but it actually works well on glass.

Hybrid sealers bridge the gap between topicals and penetrating sealers. The particles are engineered to penetrate mid-range concrete (6,000 psi to 12,000 psi).

### Considering flexural strength

Once you have enough compressive strength to polish and seal, we need to switch our focus from compressive strength to flexural strength.

GFRC is the king of flexural strength in all directions. GFRC has compressive strength in the area of 10,000 psi

(depending on mix design) and flexural strength in the area of 3,000 psi (depending on fiber and fiber load).

GFRC shines when it comes to making complex 3-D structures. There are no worries about how to reinforce GFRC (except for long spans), as the reinforcement is part of the product. However, traditionally GFRC lacks the range of surface looks available with wet-cast concrete.

The flexural strength of wet-cast concrete is roughly 10 percent of its compressive strength unless special additives are used. In most cases this is not high enough to withstand the loads placed on a piece during delivery and installation. Wet-cast concrete requires the strategic placement of reinforcement to resist flexural strains.

Ladder wire may be all that's required in some cases, but ribs or beams reinforced with rebar may be needed for long spans.

### Hybrid mixes

Concrete countertop makers tend to be opportunists and innovators not bound by convention. Traditionalists would condemn any GFRC mix that fell outside of a strict

definition of GFRC. However, countertop makers sometimes put glass fiber in wet-cast mixes and aggregate in GFRC mixes. In many cases these hybrid mixes give the creators the look they want with the compressive and flexural strength they need.

I believe with a little knowledge and implementation, concrete countertop makers can stop making excuses for cracks and other flaws and start delivering a quality product with an endless array of choices.

When your concrete hits certain strength thresholds, it's vital to understand what it's doing and why. You can gain clues without testing. Ask: Does it warp? Does it take a polish? Is the sealer acting the way it should?

Even better, do some simple testing. A simple way to test is to cast wet-cast (with larger aggregate) into cylinders or sand mixes into cubes. Find a local lab and get some breaks. It beats walking around in the dark. 🚧

*Mark Celebuski is a partner at Trinic LLC, a company that offers protective solutions for concrete, stone and tile. He can be reached at mark@trinic.us.*

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# Pouring Concrete with Acid Staining in Mind

by Nick Dancer

**W**HEN preparing a brand new concrete surface to be acid-stained, don't take anything for granted. Every step of the new concrete pour contains elements that might affect the quality of your acid stain job.

Acid stain, as you may know, works by reacting with the composition of the concrete to create permanent and variegated color. The quality and character of the surface plays a major role in the outcome of a reactive stain project. Proper preparation of the concrete surface is a must for successful acid staining.

A specific situation that requires extra surface-preparation planning is newly poured concrete floors that you plan to acid stain. We encounter this situation more and more as the construction industry takes a turn from remodeling work to new construction. As more opportunities for

working on new construction projects present themselves, we try to impress the general contractors with the importance of planning how the surface is poured, placed and finished so that we have a clean canvas to work on.

Not only have we learned how to work with contractors to make sure the concrete is poured correctly to help with our preparation, but we have also learned some new principles along the way for completing our work.

Let's break down the pouring and finishing process into segments and take a look at how each can be better handled for successful completion.

## The mix

To help control moisture migration and vapor emission problems on interior concrete floors, a vapor barrier should be placed under slab before the concrete is poured.

Rich portland cement content is essential for good stain reaction. Five or six bags of cement per yard of concrete are ideal. This is enough cement for thorough reaction and produces a floor that will be about 4,000 psi. Typically, hardness will increase with a higher cement load.

When you're pouring in colder weather or needing a fast-setting mix, you should use an accelerator other than calcium chloride, which can affect the stain's color.

Pozzolans or cement replacements may also affect your ability to acid stain the concrete. Keep your pozzolan load to less than 10 percent of total cement content.

## Pouring and placement

Concrete is to be placed, floated and smoothed per ACI guidelines.

Keep the water-to-cement ratio low. Overwatered concrete, especially in colder environments, tends to "pop" its surface in winter.

If the concrete pour will take multiple days, the client should know and understand that the stain may look slightly different from pour to pour.

## Finishing and curing

When you are finishing new interior concrete, the surface should be power-troweled smooth until no ridges are left on the surface. The surface should not be burned or slick-finished, as this can close up the surface and decrease the ability of the acid stain to work.

An exterior concrete surface should be prepared according to specifications. Outdoor surfaces are usually left rougher or with some type of broomed or textured finish so the surface will provide traction when wet. If outdoor surfaces in cold weather climates are power-troweled the surface tends to pop or flake.

Curing compounds should not be used on the concrete, as they will not allow the stain to penetrate. A wet-cure method will allow the concrete to gain the required strength and allow for proper staining.

## Protection during construction

The concrete needs to fully hydrate and reach its required strength before acid staining. New concrete can typically be acid-stained three or four weeks after initial concrete placement.

If the new floor is to be used during the curing period, some extra precautions must be taken. This may include installation of a protective barrier or otherwise warning other trades to maintain the condition of the new floor. One way to let other trades know about the planned staining and the condition issue is to hang signs around the job site informing everyone that the concrete will be the finished floor and asking them to treat the surface accordingly. 🚧

*Nick Dancer has been active in the concrete construction business since 2005 and started his own company, CounterCrete, in 2007. That company grew into Dancer Concrete, which is based in Fort Wayne, Ind. Contact him at [nick.dancer2@gmail.com](mailto:nick.dancer2@gmail.com).*

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## PROJECT PROFILE

# Fast Install in Old Building Pushes Contractor to the Limit

## Weight Watchers International Corporate Offices, Manhattan, N.Y.

by Joe Maty

**C**ONCRETE Concepts of NJ Inc. collectively burned some major calories when installing new flooring at the Weight Watchers International corporate offices in New York City.

The company's crew flat-out hustled, and then some, to get the job done on time.

"We were three weeks late starting out," says Concrete Concepts owner Amedeo Cilli. That's because the company had taken over for a nonunion contractor that initially contracted to do the job.

Another two weeks elapsed before Concrete Concepts started work, as the company negotiated a contract for the project.

"By the time we hit the job, it was six weeks behind, and they had to open in three weeks. We're talking 20,000 square feet. I thought, 'This is a joke,'" Cilli says.

"We began working the most insane

### Project at a Glance

**Client:** Weight Watchers International Inc.

**Decorative concrete contractor:** Concrete Concepts of NJ Inc., Amedeo Cilli, president

**General contractor:** Tri-Star Construction Corp., New York City

**Architect:** HLW International LLC, New York City

**Project description:** Installation of cementitious flooring and microtoppings on three floors of a century-old office building in Manhattan's Flatiron District

**Duraamen products used:** Param Super styrene-acrylic concrete primer, Param 5500 premium grade self-leveling concrete topping, Sgraffino microtopping, Perdure A03 clear acrylic sealer, Perdure E32 water-based epoxy primer/sealer, Perdure U45 water-based aliphatic polyurethane topcoat, Cp1000 acrylic copolymer/primer

**Other materials used:** Ardex Feather Finish

**Equipment used:** Prep/Master STI-3030 grinding machine from Substrate Technology Inc., HTC 80 iD vacuum system

**Challenges:** Accelerated timetable for completion of installation of complex cementitious flooring system, installation of flooring system on existing plywood base, logistical complications due to presence of other construction trades during project



Photos courtesy of Concrete Concepts of NJ Inc.

hours we have ever worked,” he says. “Most of the guys were doing 16-hour double shifts. The biggest pour was on Easter Sunday, to try to meet the deadline.” The move-in date for the owner was ironclad, with no wiggle room.

The job called for installation of cementitious overlays on three floors of the building — the fourth, fifth and sixth floors of a building at 675 Avenue of the Americas in Manhattan. The structure, considered postmodern in architectural style, dates to 1901.

“It’s a very old building with wood floors, and they wanted concrete,” Cilli says. “There were maybe 10 layers of other tenants’ stuff on (the floors)” — adhesive and VCT tile, primarily. Underneath was a plywood floor, over the top of the original wood plank flooring.

To remove the tile and other remnants of previous floor coverings, Concrete Concepts used hand-scraping tools and a Prep/Master STI-3030 grinding machine from Substrate Technology Inc. with a carbide bit, an effective approach for softer materials such as vinyl tile, Cilli says. Hand-grinding tools were used around edges.

The crews also had to wade through dirt and debris left by other trades, such as drywall installers, at work on the renovation of the office space. Here, Concrete Concepts put to use a recently purchased HTC 80 iD vacuum system, equipped with a high-performance, integrated “preseparator” that is reported to remove up to 95 percent of

dust and debris, increasing filter life.

The scenario differed on the sixth floor, where the crew found that the subfloor was covered with an existing gypsum-based material. Here, it was decided that the best approach was to leave the “gypcrete” in place and use a high-performance primer to install the new cement-based flooring system.

Installation of the flooring system began with attachment of wire lath to the plywood flooring.

The flooring was put down in common areas of the three floors — lobbies, food courts and hallways.

### Getting things rolling

Following extensive masking of adjacent walls, Concrete Concepts got things rolling with application of a primer coating — Duraamen Engineered Products Inc.’s Param Premium Primer, a styrene-acrylic formula specifically designed for use on self-leveling concrete flooring. After adequate dry, diamond metal mesh was installed. Here, Cilli says the size of the job necessitated the purchase of pneumatic nail guns, as it was immediately evident that nailing by hand wouldn’t cut it with the



project’s aggressive timetable.

Another coat of the same primer was spray-applied after lath installation. Then came 3/8 inch of Duraamen’s Param 5500 self-leveling concrete, a CSA-based material that can be applied at thicknesses of 1/4 to 1 1/2 inch.

The following day, a 120-grit sanding screen was employed, using a floor-buffing machine, to address residual surface byproducts of the cement hydration process. Duraamen general manager Victor Pachade says this step is standard practice with installation of the self-leveling concrete.

Two coats of another primer product — Duraamen’s Cp1000 premium-grade acrylic copolymer — were then applied to the self-leveling concrete. The high-solids, crosslinking acrylic emulsion offers a high degree of adhesion to various substrates, and it is also used as an additive in the company’s microtoppings.

The multistep installation process then moved to the microtopping phase, with three coats of Duraamen’s cement-based Sgraffino, using a custom color blend, a type of beige. The microtopping colors are produced on the job site by mixing the microtopping cement and color pigments.

Cilli says the microtoppings varied in composition, with larger-grit sand in the first layer, a medium grit in the second and the “superfine” grade for the top layer. Cilli says the superfine grade of the microtopping is the only material of its type he knows of that can be applied using a spray gun. Application in this way produces the glass-smooth surface specified for the flooring — zero trowel marks.

For the color, Concrete Concepts’ objective was a match of the color chosen by





the design team and the original flooring contractor on the job. The contractor had provided a sample of the color, which Cilli referred to as “Cork.” But the exact formula was not available. Experimenting with different blends, Cilli says the crew needed five tries to get it right. “We hit it dead on, eventually.”

Also added to the microtopping formula was the Cp1000 acrylic copolymer. The additive is reported to function as an accelerator in this type of use, boosting cement hydration and bonding to the substrate, says Duraamen’s Pachade.

The flooring system was completed with spray application of a sealer — Duraamen’s Perdure A03 clear acrylic — followed by roller application of the company’s Perdure E32 water-based epoxy primer/sealer, and finally with a spray application of Duraamen’s Perdure U45 water-based aliphatic polyurethane topcoat in a matte finish.

The system used on the sixth floor varied from the approach used on the fourth and fifth floors, as Concrete Concepts applied a different primer on the existing gypcrete surface. Here, the primer used was Ardex Feather Finish, a cement-based underlayment described as a blend of portland cement and other hydraulic cements.

Cilli says the relatively soft gypsum-based surface presents a difficult substrate for adhesion of cementitious flooring materials. Seeking the optimal solution, Concrete Concepts ran a series of tests on a section of the floor, using six different combinations of primers and microtopping. The Ardex product was found to offer the strongest bond, he says. “It sticks to everything, and everything sticks to it.”

From that starting point, the system components were identical to the approach used on the lower floors.

### Logistical high-wire act

For Concrete Concepts, the job started out on days, but shifted to nights and weekends as flooring installation was wedged in around other aspects of the renovation.

“All the other trades were taking the space, and we saw it was going to be impossible to get them off the floor again, although the GC (general contractor) was trying,” Cilli says.

In working to coordinate the flooring installation with other contractors, Concrete Concepts and the GC came

up with a plan to pour the self-leveling cement one floor at a time, make way for the other trades, then return some time later to finish with the microtopping layers. The project team decided that the most viable approach would be to set aside three separate weekends to finish the flooring installation — one weekend for each floor.

By the time Concrete Concepts crew returned to the scene, the cement surface installed earlier had been subjected to traffic from the other trades, and the first order of business was extensive cleanup.

“We would start with one crew on Friday night at 6 p.m. It would take two to three hours to clean the floor, to get back to where you were when we poured it,” Cilli says. Then, a new primer coat was applied using the Duraamen Cp1000, followed by a first microtopping early the next morning. With several hours of dry time between coats, the microtoppings were completed by Saturday night.

The first two microtopping layers were poured and troweled, while the third layer was sprayed out of a paint gun. “This is done when the customer wants a look that is not troweled,” Cilli says.

By Sunday, the flooring was in place, and the crew applied the topcoats and sealers over a period of several hours.

Concrete Concepts pulled out all the stops to get the job done, Cilli says, as his crews worked nearly nonstop over the three weekends to meet the timetable, with each crew of about five working 12-hour shifts or more.

But pace was only part of the story, as Concrete Concepts had also devised and executed a complex, multiphase flooring installation program to essentially create a shimmering, decorate-concrete floor on a base of plywood and gypsum substrates.

“It was out of the ordinary in that we were trying to turn a plywood floor into a concrete floor,” Cilli says. He contrasted this multicomponent job with another recent project, a decorative microtopping on a newly placed concrete floor in the Empire State Building. “We only used one coat of the superfine (microtopping), because there was a perfect new concrete floor in place,” he says.

“The first challenge was, we were starting behind the eight ball,” he says of the Avenue of the Americas project’s accelerated timetable. Then there was the matter of creating the decorative concrete floor on plywood, “one of the hardest of jobs to do,” he says. But the ultimate challenge, he says, was the logistical gymnastics required to make it all work. 🛠️

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# Q&A: Jim Ward, Ward Scott Architecture

## A veteran Alabama architect embraces polished concrete in schools

by John Strieder

**A**LL over the country, architects who design primary and secondary schools are warming to polished concrete. Jim Ward, of Ward Scott Architecture, Tuscaloosa, Ala., is one of them. His firm's most recent project, Big Sandy Elementary School, part of the Tuscaloosa County School System, opened this school year.

The new school is the first one the veteran firm has designed with polished floors throughout. And it showcases a wealth of decorative effects, highlighted by a "Discover Earth" theme in which each wing displays animals and plants from a different continent on its walls, floors and ceilings. Polishing contractor Jeffco Concrete Contractors, Tuscaloosa, used vinyl stencils and 20 dye shades from L. M. Scofield Co., Consolideck and AmeriPolish to lay down the artwork.



The all-polished concept isn't a fluke. Ward says the success of Big Sandy has inspired that school district to declare that all its future schools will be polished going forward. And the project turned heads at the neighboring Tuscaloosa City Schools district, which has commissioned Ward Scott to design a new all-polished school for them as well.

*Concrete Decor* spoke with lead architect Jim Ward on his path toward polished concrete, what he likes about the medium, and some of the growing pains his teams have experienced embracing it.

### When you're designing a school, how do you decide what kind of polished concrete to put in?

Decorative is what I was interested in, more than just solid colors of concrete floor. I wanted there to be some patterns, some decoration in the floor, because that's traditionally what we've been doing,



These penguins, located in the Antarctica corridor at Big Sandy, were colored with Black and Gold dyes from AmeriPolish. The white bodies of the penguins are actually bare, uncolored concrete.



Photos by Barry Fikes

In order to get the exact shades the designer was looking for at Big Sandy Elementary, Jeffco Concrete Contractors used 20 different dye colors from three manufacturers: AmeriPolish, Prosoco and L. M. Scofield Co. Colors from all three manufacturers were used to create this world map in the lobby of the school.

albeit with vinyl tile. We've had a lot of success creating some very interesting floor patterns with vinyl tile working with my interior designer — tiles cut with a water jet so patterns come in a box ready to be put down. We wanted to try to accomplish that as much as we could with polished concrete.

I think more and more, we are realizing the real cost benefits of polished concrete to the school system down the road, and we think that's where we need to go. So we're trying our best to embrace that product and yet still provide some decoration that we're used to doing in schools.

### What first led you to consider polished concrete — the decorative aspect or the cost benefits?

I think it was the cost benefits to start with. We started hearing about it and were interested. Three or four years ago, we



traveled around central Alabama with a previous school superintendent looking at polished concrete projects that had been done. Some we liked a lot, some we didn't like so much. Some were done at a high-quality level, some not so well. But we saw the benefits of it, and we liked it, and we wanted to try it some more to see if it works for us.

**When you say you saw projects that were low-quality, what do you mean by low quality?**

It appeared that the polishing was not wall-to-wall, and that there were some areas close to the wall that maybe did not receive the right kind of equipment in order to match the field.

**You started with the cost benefits. How did you learn about the decorative opportunities?**

That was part of what we went to see when we toured the schools. We and the superintendent were always fond of the decorative aspects of flooring in schools. And in fact, the school I mentioned that had kind of a low-quality installation really had kind of a low-quality color layout too. The whole school was really pretty dull. And we didn't want it like that! We wanted to do more.

What I'm hearing and learning, and I may be on the back end of the learning curve, is that we have more opportunities to introduce color in the last couple of years than we did previously.

Going forward I'm going to consider what else we can do with concrete to brighten up those colors a little more. But we've had great success with patterns at Big Sandy, and it's interesting it turned out as well as it did.

**When you were looking around, do you remember who first told you, 'Look, it can look better than this. There are some color options that you can look into?'**

I've known Jeff McCool (president of Jeffco) for 25 years and we've worked on many different decorative concrete projects other than polished concrete, and he really worked hard to bring polished concrete to our attention.

I've always been around his treatment of concrete — staining and Bomanite and those things. Stained concrete had to have a sealer put on it, which then became something that had to be resealed down the road. It never seemed to take off. It was more of a



This swimming hippopotamus at Big Sandy Elementary was colored using Black and Grey shades from AmeriPolish and Rose Quartz from Prosoco's Consolideck GemTone line.

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hassle to take care of than what the school maintenance personnel were used to dealing with. So we were never sold that it was the best solution.

### You did a polishing test in a cafeteria at another school before you did Big Sandy.

We decided to polish the cafeteria at Duncanville Middle School (a Tuscaloosa County school) four or five years ago, probably before we decided to visit other schools in the state. We have some large swaths of dyed color in there. One corner of the room would be one color and another corner of the room would be another color, and there would be a big circle in the middle. Not a whole lot of an attempt at intricate patterns.

And we've heard only good things from the principal since then, so that's encouraged us to try to use that some more. We've used it in places like activity buildings, indoor play areas, cafeterias. But Big Sandy is the first school where we just used it throughout.

### Now we're up to the Big Sandy project. Whose idea was the continent motif?

I think the motif of all the patterns came from the interior designer. It's a world theme, and different parts of the school cover different continents. The designer, Deborah Roy, came up with images of these continents and created templates and plans that showed the contractor what to do and where to put it. That was coupled with paintings on the walls that worked with that motif. It's not just the floors, but also the walls and the floors.

Throughout the time I was learning about polished concrete, Deborah was learning about it at the same time. We liked the idea of the product, wanted bright



colors, and I think we're beginning to see that we can get there with it. At first I didn't think we could.

The maintenance aspect has made us look more closely at it, and I think that we're now seeing that we can get where we want to be from a decorative point of view.

### You mentioned cost benefits, maintenance and growing decorative capabilities — what are the other benefits of polished concrete in the school that you can see?

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### Is polished concrete cheaper than tile?

No, I think the upfront cost is more but it pays for itself in a short period of time.

### Now you're moving on to a newer project that is also going to involve polished concrete with decorative aspects. Is that true?

Yes, that's true. In a different school system, we have a project that will be built next year. It's a new K-8 school in the Tuscaloosa City system. It's a replacement for an elementary school we did that was destroyed by the tornado in 2011. It will be a performing arts school too, and we're going to utilize the polished concrete again through the building. I think everybody's really kind of settled on that being the best permanent, durable floor for schools going forward.

### Is there anything you've learned from the Big Sandy job that you plan to incorporate into plans for the new school that will improve the job?

I think we're paying more attention to what we need to do to the concrete for controlling cracking. We're putting in an admixture (Eclipse 4500 shrinkage-reducing admixture, from W.R. Grace and Co.) to help reduce the cracking during the initial 28-day period as the concrete cures, and we're hoping that's going to make a difference. We had some — concrete's going to crack, no matter what. We try to control it and it's still going to crack in some places that you wish it hadn't. We just want to reduce the number of those if we can.

### Have you found that there are spaces in schools where it's better to not have polished concrete?

Certainly the media center needs to be a quieter place, and so we're putting carpet in the media center for that reason. In an elementary school, kids spend a lot of time on the floor, and a concrete floor may not be as comfortable, but elementary school teachers always use, and we expect they will use going forward, throw rugs in areas where the kids are going to be on their knees on the floor.

We are putting a real gymnasium in (the K-8 school), so we are putting a little bit of a more resilient floor in there just to provide a little bit more protection for kids as they fall. It's going to be a soft rubber material, only about 3/8-inch thick, that sits on top of

the concrete. Just a finished concrete floor in a gymnasium can potentially cause more injuries.

### In the cafeteria there's going to be a lot of food spills. Do you do any special treatments in cafeterias to guard against food stains?

I haven't, and I haven't had any problems with that in the cafeteria, eating and dining area. We do have problems with that in the kitchen and I put in porcelain tile to provide a nonporous surface. But in the dining area

we have not done anything extra and have not had any problems.

### Going back a little bit, when you talked about how the interior designer had designs on the walls and floor, it sounds like from an architectural standpoint there was an attempt to create a complete environment in which concrete plays a part.

Yes, and really kind of a permanent motif. Which is done in talking with the school system and particularly the school principal about goals for the school. It



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needs to be something as basic as world geography, things that never change, in order to do something as permanent as putting it in the concrete floor. That which is painted on the wall can be painted over in time, but to start out with, we give them a total design that encompasses everything.

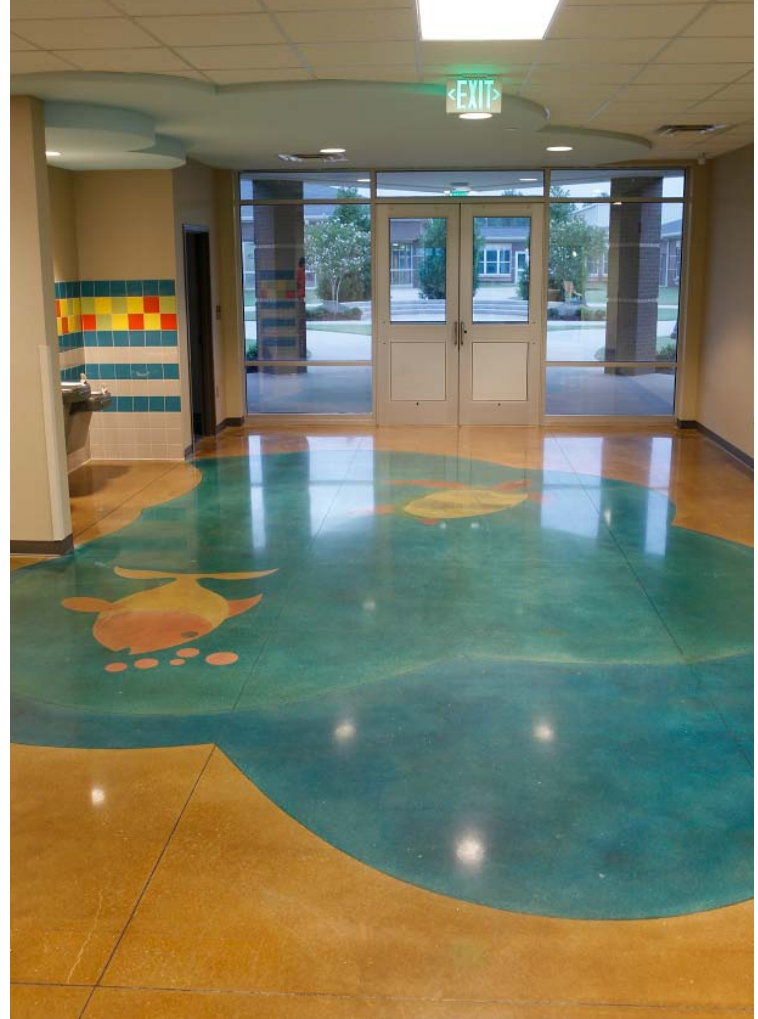
**From a conceptual standpoint, what advantages are there for students and teachers to have that kind of environment?**

I think it enriches the environment and piques the interest in the educational part of what they do. That's our job, is to create a good educational environment for children, and I think those kinds of decorations create interest and questions and discussions that augment the whole educational process.

**The triangular relationship between your firm, Deborah Roy, the people placing the concrete — how does that work?**

The interior designer is working for me, so we're a team, all one design team, and we work together as we have on many other projects. On this one we got together and talked about what we were going to do. I listened to her ideas, we modified those and moved forward.

But particularly as we learning more and more about polished concrete, we did that in concert with Jeff McCool, gaining from his experience as well, as to what our options are and how we handle what we'd like to do. There was a discussion through all of this about how polished concrete works and how we can integrate designs into it, particularly on this project. Because this is the first time we've done it in polished concrete as opposed to jet-cut vinyl tile.



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**You were working with Jeff as a consultant before he won the bid, then.**

Yes, and the fact is he still had to be low bidder on the project. It's still up to him to get the project. It's not like we were using proprietary materials that gave him a benefit in that regard. I know there are other contractors who can do exactly what we specify.

**How did that relationship start? Did you turn to him and say, "We're thinking about doing this throughout the whole school, what are your thoughts?"**

Yes, we did talk to him about that. And of course he's got a product that he wants to see put in schools. He's walked in the door several times and talked to us about it and brought us pictures. When we toured other schools, he went along with us. Some of them he did, some he didn't do, but he looked at them and commented on them.

The fact that he's a local contractor and is someone we've known for a long, long time makes it easier for us to talk to him about it as a resource. He's really kind of pushed the product and we've listened and we've resisted and we've learned. He's been a big factor in us getting to know the product.

**The Tuscaloosa City school is in a different school district from Big Sandy, which is in the Tuscaloosa County district. Was their interest piqued by the Big Sandy project? Did they come to you?**

We brought it up to them but they're seeing it in more schools around the state just like we are. It's not new news. Their knowledge of the system to start with and our encouragement and enthusiasm about it made it an easy sell. Although it's a slightly higher cost to start with in this area, the final long-term cost makes it an easy decision.

**And the Tuscaloosa County school district is now committed to doing polished concrete in all of its future schools?**

Yes, moving forward that's pretty much what we're going to do, because everybody

like the fact that you're not having to strip and wax all the time. I think that's a huge deal.

What we're going to do is try our best to push the limits of what we can do with polished concrete from a decorative point of view and learn how we can do it better. I already mentioned reducing cracking. I'd like to look into ways to brighten the colors some and I know there are ways to do that. We're just learning as we move forward.

**When you wrote the Big Sandy spec, what polishing-related things did you address?**

We really did not change our spec much. That's part of what we're learning from. As we see what's happening, we're trying to learn about what we can do to improve it. We're still learning.

We're doing a better job with this spec this time around, including the admixture we just discussed.

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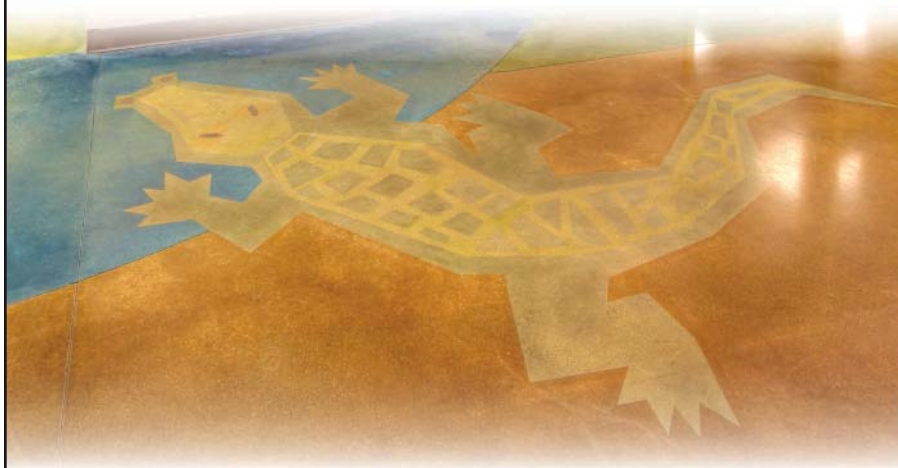
**What other things are you including in the new spec?**

We talked about and have decided not to include, from a cost point of view, a reinforcing mesh. We thought the cost had come down to the point where we could consider it. And we're talking about not just fiberglass, but something that's more

of a high-end product, that's more metallic. The cost is something that we cannot deal with yet.

And then I'm going to take a look at color improvement in the concrete as well. 🛠️

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# Look Out! Light Sources Will Affect the Color of Your Dye

by Peter Wagner

**W**HEN you are asked how well you understand dyes, are you confident? Maybe you shouldn't be. Unless you or your customers have art or design backgrounds, or you have been burned on a project, you are probably naïve.

I was burned by dyes back in the '80s on my very first sales call, when I was selling commercial carpet tiles. My employer specialized in custom designs through the use of injection dyeing. I was asked to provide a custom sample, and I set everything up as I'd been taught and submitted the sample request. The sample showed up, and both the designer and I were very impressed as we viewed it in her office.

We were impressed, that is, until we took the sample to the project site. What we ordered as purple, and had looked purple in her office, came off as a horrific-looking brown at the project site. The culprit?

Neither of us knew enough to first confirm the light source where the installation would occur.

Dyes look different in our eyes depending on the wavelength of the light source, or sometimes combination of sources, that is illuminating them.

Floyd Davis, a professor of chemistry and chemical biology at Cornell University, addressed this topic on the University's website: "Highly colored molecules that absorb at certain wavelengths, known as dyes and pigments, have been used for thousands of years to add colors to materials," he wrote. What we and our customers need to understand is that the absorption of colors is the work of the dye, but what is then reflected or transmitted back to our eyes is determined by the light source.

Light is measured in Kelvins, a unit of

measurement for temperature, and color temperature is a characteristic of the light that we see. Color temperatures of more than 5,000 K are described as cool (bluish white), while colors in the range of 2,700 K to 3,200 K are considered warm colors (yellowish white to red).

Whenever you are involved in a concrete project that will be polished, the first question that you need to ask is whether or not color will be a part of the specification. If the answer is yes, then the next question is how the color will be imparted to the floor.

If the answer is integral color, you need to be aware of the effect of your light source on how your color is perceived. And you very definitely want to be aware of this if you are applying a topical dye or micronized pigment.

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Light boxes set up at a paint store. Not only do the three identical samples look different under different light, the room renderings do too.

## Determine the base color first

Before you worry about your light source in regard to the perceived color of your dyes, you must recognize the true color of your undyed concrete mix, including cement, aggregate and fines. Not only does every region of the country have varying hardnesses of concrete, but they also have varying colors dependent on the colors of the cement, fines and aggregate. Just because two batches contain quartz sands does not mean they are the same color.

So it is important for a customer to evaluate both the possibility and the cost of replicating a look between regions. Remember that dyes are translucent in nature, so they will be directly affected by the color of the concrete they are applied to.

When you are asked to provide color in the form of a dye, it is imperative that you identify the color of the mix and the predominant light source. And once this has been done, make sure that you produce samples for approval — and that they are only approved under the specified type of lighting.

## Mock up the lighting

In addition, when producing your mock-up, it is necessary to again ensure that the

light source at the mock-up is similar to what will be found at the project site.

Looking at examples, you can see what happens to the perceived color based on a shade variation in the mix. As you might expect, the lighter, more translucent colors, such as mango (an orange-yellow), will show more variation than a darker, more opaque color like black or blue. If you have questions about how colors may appear, one option is to make up some small samples, then visit a local paint store or lighting store and ask to use the light boxes that many have in place for their customers.

## Using digital cameras

A related thought concerning the application of dye to concrete: Be aware of the limitations of digital cameras when “reading” the colors in the same manner that film cameras could in the past.

Instead of film, digital cameras depend on their CMOS chips to discern and store your photographs. Some cameras excel better than others in the ability of their “auto” modes to capture photographs in which the color matches the sample.

In addition to evaluating your camera’s ability in auto mode, you also want to have the ability to change your camera’s white

balance to reflect the project’s light source.

Most digital cameras provide you with the ability to take images with processed “lighting” that mimics daylight, shade, incandescent bulbs and varying fluorescents.

If you want to ensure that red is red and black is black, always read the instructions, verify site conditions with your customer, and know your concrete color and lighting. Do these steps on every project, and you will develop a strong reputation as a color expert. 📷

*Peter Wagner is the owner of Concrete Flooring Solutions LLC, Portland, Ore. He works with installers, manufacturers and specifiers to provide industry-specific and system-based solutions. A former polished concrete contractor, he has provided marketing, training and consulting services throughout the industry for the past 13 years. He may be reached at [pbwagner@concreteflooringsolutions.net](mailto:pbwagner@concreteflooringsolutions.net).*

# Tips for Grinding and Polishing Seeded Glass in Overlays

by Heidi Hudnall and Dan Knuth

**D**ECORATIVE concrete is especially helpful for company branding purposes or to make a bright and impactful statement in an indoor or outdoor space.

In this light, it's easy to see why glass adds a unique dimension. It's different and it catches the eye, which is something appealing for businesses.

Another reason for the trend towards glass is the recycled element and the desire for LEED points, says Dustin Thornley, sales manager at American Specialty Glass. Much New York City-funded construction is now required to meet LEED Silver certification standards, for example, and using recycled glass can meet this requirement while also providing a way to add color and design.

Finally, glass in concrete overlay is cost-effective. While terrazzo boasts many benefits, glass-infused overlay is more affordable, and it still accomplishes a finished look. It mimics the design and overall effect of terrazzo at a lower cost.

Incorporating glass into a concrete overlay is one of the main ways to achieve a colorful and dynamic polished look. There are two recommended methods with which to accomplish this — either by mixing integrally or by broadcasting. (We suggest using CTS Rapid Set's TRU Self Leveling overlay, and the techniques in this article were developed with that product in mind.)

## Mixing integrally

When adding integral glass, it is recommended you mix the overlay first. If



Glass aggregate was mixed integrally into this demo slab for a booth at the 2013 World of Concrete.

Photo courtesy of Runyon Surface Prep Rental and Supply

you are using AmeriPolish's integral color, mix the water and dye, then add the overlay material. Next, screen the product with a 1/8-inch classifier to remove any unmixed material or clumps. Lastly, mix the glass into the overlay. This technique is ideal for a 50 percent load using size 0 or size 1 glass. You want to use smaller glass because it has a better chance of staying close to the surface when placing the mix on the floor.

In terms of the finishing technique, you can generally gauge the rake depth at 3/8 inch depending on the load. Be sure to not

use a spike roller — it would only succeed in pushing the glass around. Rather, for mixing integrally, the preferred finishing method is with a smoother.

## Broadcasting glass

Broadcasting is a much more delicate process than mixing integrally. This option really depends on the set time of the overlay. If you throw the glass too early, it will all sink to the bottom, meaning it isn't visible. Conversely, if you wait too long, the glass will sit on the surface, not penetrating, and could be pulled out of the overlay during the initial grind.

The size of the glass influences when you broadcast, since the weight of the glass is relational to the size. In previous tests we've used up to a size 2, but generally we use size 1. If the glass is larger, thus heavier, you should wait longer. If the glass is smaller and lighter, broadcast sooner. Again, keep in mind that this is a delicate process, so time it as accurately as possible.

When you do the initial grind, be sure to grind the surface enough to where there is not a void between the glass and the overlay — you want the two to bond or

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else the polish will be diminished. Also, be aware that when you broadcast, it is difficult not to have pullouts. We use a grout coat to fill pits left behind when the glass is removed.

For the broadcast finishing process, here are the steps:

- Place the product
- Gauge rake to set depth
- Purge any air pockets with a spike roller
- Soon after the spike roller is used, broadcast the glass


When you get to the third step, consider using a new porcupine roller. The spikes are stainless steel and are 1 1/4 inches in length. The advantage of this new roller is that it doesn't leave spike marks like plastic spike rollers do. This new metal roller has pinlike spikes, meaning they aren't as thick.

Once the four-step process is complete and the initial set of the overlay occurs, do not use a trowel or any other tool to press down glass that did not fully penetrate the overlay. Doing so will leave an impression that could be difficult to get out.

## The hybrid approach

While not common, it is possible to combine the above two techniques into a hybrid approach. Meaning, you would first mix the glass integrally, and then you would broadcast after the product is placed.

## The final step: grinding and polishing

After the overlay is set, the final step to ensure a finished look and preservation of the floor is to grind and polish. These processes are documented and readily available to you. However, note that since each manufacturer carries different products, the steps will vary due to product-specific characteristics. 

*Heidi Hudnall is marketing coordinator at Runyon Surface Prep Rental and Supply, an Indianapolis-based distributor of flooring products for prep, polishing and removal. Reach her at [heidi@runyoncompanies.com](mailto:heidi@runyoncompanies.com).*

*Dan Knuth is a flooring equipment expert at Runyon Surface Prep Rental and Supply. He can be contacted at [dank@runyonsurfaceprep.com](mailto:dank@runyonsurfaceprep.com).*



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## CARLTON'S CORNER

## Three Tips for Superior Acid Stain Finishes

**T**HE acid-stained pizzeria floor looked worse than horrible.

Actually, it became the unintentional focal point of an otherwise attractive restaurant newly opened and ready for business. I felt bad for the owner because

I knew this gentleman had invested plenty



by Doug Carlton

of time and money expanding into a second location. There was no turning back — the auburn-colored mess was there to stay in all its ugly glory.

A bad stain job is an unnecessary part of life. The aforementioned project could just as easily been attractive, leaving every diner with a favorable introduction to stained concrete. This, unfortunately, was not the case.

A quality stain job is no accident. The combination of colored acid and concrete is an amazing medium, but only in the hands of someone prepared to make the proper effort of artistry.

Acid staining confuses too many so they shy themselves into a more expensive concrete staining process. The fact is, few products or procedures provide the colorful penetrating reaction of acid staining. Also, our industry offers few other products that provide the translucent colorful effect of acid staining.

There are only a few vital steps and procedures involved in every successful stain job. Each step layers over the previous step, compounding effort and skill into something extraordinary. There is little need to spend time and space on the importance of cleaning the concrete surface or providing on-site samples. Most readers realize this as necessary and assumed. The three steps and procedures I want to focus on go beyond such stained concrete basics.

### Use appropriate dilution ratios

It is imperative to realize that all acid stain is sold condensed. It almost always requires dilution with water to create a more workable stain consistency. The darker the stain color, the more dilution required. Too much water and the chemical reaction will become compromised. Too little water and your project will look similar to the one in the pizzeria.

The necessary blend of water and stain is

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subjective. It could be a 1:1 blend or it could be three parts water for every one part stain. Remember, each concrete canvas is different, so the ratio of water to stain will be too.

The first stain application should favor a more diluted ratio, while the second application can be more condensed.

On-site stain samples offer the perfect opportunity to test multiple ratios of the same stain color. The more water, the lighter the stain color — nothing complex here. These samples provide the decision-maker with coloring options, but they also tell you, the installer, exactly how the concrete will react to each mixture of stain. The time for adjusting water-to-stain ratios is during the sample phase.

### Back-spray

The most common distasteful effect found on acid-stained concrete is visible brush stroking. The thicker the stain consistency, the greater the likelihood of brush stroking. In return, lighter acid-stain colors decrease the likelihood of visible brush strokes. Water dilution reduces the likelihood of brush strokes too.

The risk of brush stroking is reduced, and sometimes completely eliminated, by back-spraying behind the brushing process with a light spray of acid stain. In other words, first spray your stain over a controlled area, then brush the stain into the concrete's surface, and then lightly back-spray the area just brushed. This process allows the stain to disperse across the concrete surface without leaving patterns or stroking.

### Use specially made sprayers

Fact: Not all plastic sprayers are conducive for acid staining, and far too many stain artists find this out the hard way. It is worth the money to buy a plastic sprayer made to spray acid stain. Sure, these sprayers cost more but they are designed specifically for applying acid to concrete. I personally use the Chapin Industrial 2-gallon Acid Staining sprayer. No doubt there are other good ones available, but this is my favorite. The large, 4-inch opening allows for quick, easy and spill-free filling every time. I paid just less than \$70 for my Chapin acid sprayer and it's worth twice the money, in my opinion.

Remember, a bad stain job is an accumulation of subpar steps and techniques. Investing in the proper sprayer eliminates one way to risk a less-than-stellar outcome. Considering all three issues just mentioned will put you and your decorative business miles ahead of the local competition. 🚗

*Doug Carlton is working on his third decade in the decorative concrete industry. He's the owner of Carlton Construction, located at the base of the Big Horn Mountains in northeastern Wyoming. Doug can be reached at [carltondoug@sbcglobal.net](mailto:carltondoug@sbcglobal.net).*

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## CONCRETE QUESTIONS

## How Do I Fix Flaws in Poorly Stamped Concrete?

**Question:** We recently had a 600-square-foot concrete patio installed at our home. The concrete was colored and our contractor used what he called a "seamless stone texture mat"



by Chris Sullivan

to stamp the concrete. It has been finished for a few days and our concern is that we can see many of the edges of the stamping tools and the concrete surface looks like a checkerboard. We also are concerned about many areas where the surface has no texture and we can see trowel marks. Also, do you think that the saw cut lines I'll be adding will attract the eye to these spots if I cut right on them?

**T**HIS question reminds me of a quote that is painted in large letters on the lobby wall at the headquarters of Groninger Concrete, in Colorado Springs, Colo. It is a variation of a famous quote that has been used in aviation since the early 1930s. It has stuck with me since I first saw it some 13 years ago: "Concrete construction in itself is not inherently dangerous, but to an even greater degree than the other trades, it is terribly unforgiving of any carelessness, incapacity or neglect." (The quote is attributed to Doug Groninger Sr.)

Concrete is unforgiving. Surface defects and poor workmanship issues on stamped and textured concrete are difficult to repair, and in many cases there are no viable repair options.

In this scenario, the installers attempted to stamp 600 square feet of concrete with small 4-by-4 texture skins. They also did not overlap their edges to feather out the

seams created by the tools. These two factors created a checkerboard pattern, with many edges lacking texture.

Lastly, the installer did not provide any control joints, leaving the homeowner to research the issue online and hire a third party to come in and make saw cuts to help break up the patio, draw attention away from the checkerboard pattern and provide the control joints that were missing.

The saw cuts did help. In addition, color highlighting and antiquing methods (stains, tints, color washes, and tinted sealers) will provide additional camouflage to hide some of the poorly finished areas. Another method I have seen successfully used in these situations is to grout or caulk the saw cuts a contrasting color to further draw your eyes away from the imperfections.

In extreme cases a thin microtopping layer can be applied and textured to cover areas where the original texture is missing

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or poor finishing has left surface blemishes. However, using the microtopping option to spot-treat areas can prove challenging when trying to make the topping blend in with the surrounding areas or assure proper adhesion for a long-term repair. I always recommend sampling and testing any repair methods before attempting the entire project.

Short of these repair methods, doing nothing or removal and replacement are the other options.

The issues described above are unfortunately only a small part of a much bigger issue. Surprisingly, after so many years, I still receive what I consider to be far too many of these types of complaints. While I am not naïve in thinking stamped concrete can be completely problem-free, I can and do expect that those promoting themselves as professional stamped concrete installers (anyone installing stamped concrete for hire) has the training and expertise to avoid what I consider to be unacceptable mistakes.

The types of surface issues and blemishes addressed in the email above from a homeowner are 100 percent avoidable and

no one's fault other than that of the installer. Problems with color, cracking, curing and sealing often occur because of conditions or variables that are either not known or are out of the control of the installer. Issues such as poor stamping technique, on the other hand, are nothing more than poorly trained installers damaging more than their reputation.

What most installers don't ever get a chance to see is how one small poorly installed patio sets off a chain of events that negatively affects the industry as a whole. Those of us who make our living by marketing and promoting decorative concrete products and services on a national level have seen firsthand what this has done to the industry. A poor job, such as the one described above, changes the perception of stamped concrete in the minds of these homeowners. They paid a premium for colored and stamped concrete, were obviously looking forward to a value-added textured patio, and instead were disappointed enough to research the problem, find me, and write me an email.

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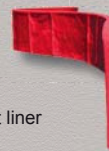
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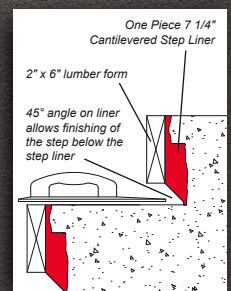
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**Above:** On this project, installers attempted to stamp 600 square feet of concrete using only small 4-by-4 texture skins. They also did not overlap their edges to feather out the seams created by the tools. These two factors led to the appearance of a checkerboard pattern, with many edges lacking texture. On top of all that, the installer did not provide any control joints. **Below:** A third-party contractor came in to install saw cuts and camouflage some of the poorly finished areas with color highlighting and antiquing methods.



Photos courtesy of Rick Gilmore

They ended up paying extra for control joints (which should have been part of the original scope of work) and overall are disappointed with what they received. I can almost guarantee you that the homeowners who wrote the email above have moved from being pro-stamped concrete to anti- or at best on the fence about stamped concrete.

When we get good service and quality we expect it and tend to make little mention of it. When we get bad service we make it our business to let as many people as we can know about how we have been wronged and how bad it was. Instead of future conversations by our homeowners being about their amazing stamped concrete patio, I imagine conversations revolving around how the homeowners saved their stamped patio by paying a third party to come in and make saw cuts that, along with strategically placed patio furniture, hide the imperfections created by their less-than-competent installer. All of those people who hear this will now think twice, if at all, about using stamped concrete on their next hardscapes or concrete project.

What I often hear as a response is, "So what's the big deal Chris? This is only one job." Sure, but for an industry that still relies heavily on neighbor-to-neighbor referrals for work, bad word of mouth is everything!

And the truth is that if it really were just one job here and there it would not matter, but it's not. It's hundreds of these types of jobs installed every year in your town or city that are slowly eroding confidence in the product. Add in the number of people who hear or see only the negative side, multiply that by the last 10 years, and you start to get the picture. I know of entire communities that will no longer use stamped concrete because of poorly installed work completed by one company over a three-year period in the early 1990s. It's 2013 and there is still very little if any stamped concrete installed in that area.


The saddest part of this story is that this scenario is totally avoidable. The process of stamping concrete is well-documented and there are dozens of product manufacturers and independent consulting companies that offer training and education on the basics. In today's world there is no reason these types of workmanship and finishing issues should be occurring. I strongly believe in diversification, and today's turbulent economy demands most concrete flatwork



installers offer multiple concrete options to survive, but being a diversified company does not mean producing substandard work.

Stamped concrete no longer seems to carry the high-end specialty tag it once did, and most residential flatwork installers offer stamped work as part of their portfolio. However, the importance of quality installation, properly trained staff, and just plain knowing what you are doing hasn't gone away. The next time you see a poor stamped concrete job, take a second and think about how that job impacts the market as a whole. 🛠️

*Chris Sullivan is vice president of sales and marketing with ChemSystems Inc. He has led seminars and product demonstrations throughout North America. Reach him at [questions@concretedecor.net](mailto:questions@concretedecor.net).*



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