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Dear Professionals,

Here's an indisputable fact for any business owner: Your employees are critical to the success of your company. Why? Because good employees do good work which in turn helps bolster your company's reputation — and its bottom line. Given that, you should have a process to increase your employees' skills, just as you have (or should have) a process to increase your company's success and profitability. Such processes are critical elements of sound business planning.

In reality, those companies who invest in their employees when times are good are the companies most likely to retain employees — and maintain profitability — when times are lean. If your company consistently excels because your employees have a full set of dependable skills, it's likely that it will be your company that clients contact even when the pool of potential clients shrinks.

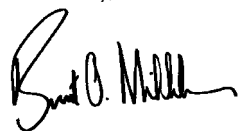
Right now you may be busier than ever before and that's great. It means your company — and your employees skills — are in demand. But what happens when the situation isn't quite so bright? Are you prepared to weather stormier business conditions? Better still, are your employees prepared to tackle new challenges that could deliver more business? If you have a plan for reinvesting in both your business and in your employees' skills, it's likely that your answer to these questions is "yes."

But unfortunately, many in our ranks are wary of teaching employees too much. Why? Because, as some contractors would be quick to point out, the employees you educate today may well be your competition tomorrow. I would like to encourage you to think differently. When they're challenged by learning new processes and techniques, and supported by a professional environment that encourages and invests in skills' improvement, employees quickly realize how much they're valued by their employers. And when employees feel valued, they're likely to be more productive — and more loyal.

This is where I would like to suggest that you consider a subscription to *Concrete Decor* magazine and seek out the educational resources our on-line services (www.concretedecor.com/cd_events.html) identify for both you and your employees. As the publisher of this journal and a former contractor with my own employees, my goal is to present information that educates, informs, and supports. If your employees read through the pages of *Concrete Decor*, they're certain to come away with new technical and industry knowledge — and will likely be challenged and interested in learning more.

If you're committed to building a stronger, more stable business, your subscription to *Concrete Decor* is an excellent — and cost effective — starting point. In fact, I encourage you to consider *Concrete Decor* as an educational resource for your employees. As always, your comments and questions are encouraged.

Sincerely,



Bent Mikkelsen, Publisher

ON THE COVER: This month's cover of *Concrete Decor* features Ken Bennett of Final Touch Decorative Concrete Specialists, Eugene Oregon. Thanks Ken. The texture inside the word "Concrete" is the Brickform FM650 — European Fan.



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Decorative Concrete Tips

Decorative Concrete Tips is a forum for readers to exchange information about methods, tools, and tricks they've devised. We'll pay for any we publish. Send details to CD Tips, Concrete Decor, P.O. Box 25210, Eugene, OR 97402. We look forward to hearing from you!

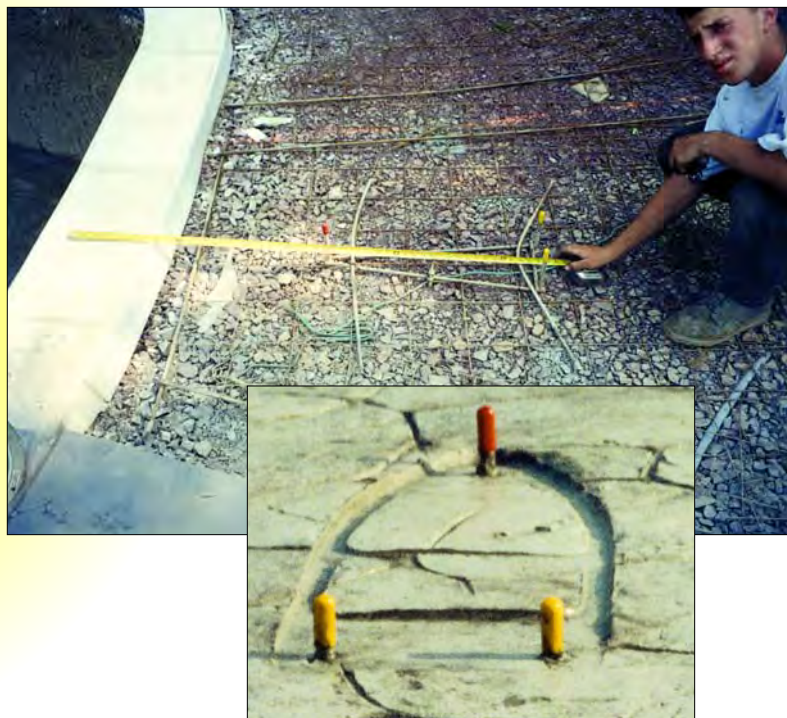
Diving Board Mount

Did you ever have to install a pool deck with an aggressive pattern and then worry about cracking or breaking the fiberglass diving board mount because you were unable to set the mount on a smooth and level surface?

Solve this potential problem before the damage occurs by first following the diving board manufacturer recommended instructions for the diving board mount set back from the pool's coping. Once located, tie wire the mount jig to the rebar reinforcements in the deck.

Proceed with the pour as planned. When stamping the concrete at the diving board mount run your pattern past the mount jig. Once you have pattern-stamped past the mount area, stamp the fiberglass diving board mount into the concrete as well. This allows you to set and level the mount base and have a perfect fit to bolt down into later. This approach allows you to keep the pitch of the deck for water run-off and still have a level diving board base.

— Bart Sacco
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WARNING: Colors May Change Without Notice

Many comments, instructions, warnings, and confused looks surround the numerous ways acid stain colors can fluctuate from one concrete slab to another. Even under the tightest quality controls, concrete reacts with chemical stains differently every time. However, the sometimes-unpredictable reactions are exactly what produce the interesting and beautiful results one can achieve from acid stains.

On this particular project, Marvin Dodson used his Rare Earth Labs concentrated concrete stains to color the two concrete foundation slabs placed side by side at a hotel complex. These slabs support two two-story complexes, and even though they may have been placed within a weeks time of each other, by the same contractor, with concrete from the same ready-mix plant, the pictures illustrate how stain colors can and will change from slab to slab as easily as a sunset's color each evening. Because these floors do not intersect with each other nor are they visible by the same person at any given place, they were gladly pre-approved by the customer and designer, having been pre-warned about the

sometime erratic nature of acid stain. They were even flexible enough to change the wall color to complement the stained floors.

The key to achieving the look

you want and eliminate surprises is to test, test, test. Rare Earth has developed a test kit that includes a generous supply of each color for just that purpose. Marvin highly recommends this to each of his customers and also emphasizes the importance of educating the customer about the nature of acid stains before they are used on a job. Remember, much of the beauty and appreciation in stained

concrete is the so-called unknown, natural variegated look that the stains produce in contrast to other floor coverings. This can be easily achieved with a little testing, practice, imagination and the willingness to be a little flexible regarding the outcome.

—Marvin Dodson, Rare Earth Labs
El Dorado, AR

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Master Builders and Scofield Form Alliance to Expand Colored Concrete Market

Master Builders, Inc. and L.M. Scofield Company have formed a sales and marketing alliance designed to expand the demand for, and use of, colored architectural concrete throughout North America. In joining forces, the two companies emerge as the only full-service supplier of concrete admixtures able to provide improved products, comprehensive service and technical expertise in colored concrete technologies, and move colored architectural concrete from a niche to a mainstream market.

In the United States, demand for colored concrete is estimated at four to six million cubic yards per year, approximately 1 to 1.5% of total production, but that figure is expected to double within the next four to five years. "This is an important market that offers ready mix and precast concrete producers an avenue to expand their operations, and increase the value of concrete as an attractive and functional design and construction option," stated Mike Shydrowski, President and CEO of Master Builders. "With high quality colored architectural concrete, we are providing architects and designers with cost-effective and durable alternatives to conventional wood, stone and brick building products."

Both companies will manufacture and market CHROMIX® Admixtures, the Scofield brand name that is respected throughout the world and the industry. The original formulation of powdered CHROMIX® Admixtures will continue to be available from Scofield. A new line of liquid integral coloring admixtures, CHROMIX® L, will be introduced early this year and will be offered to ready mix and precast concrete producers through Master Builders.

Together, Master Builders and Scofield will provide extensive training and support to contractors and producers to ensure successful and expanded use of colored concrete. Scofield will continue to work with the design, engineering and contractor audiences to generate specifications and promote quality placement of colored architectural concrete. Master Builders will work with

ready mix and precast producers to accelerate the acceptance and understanding of quality colored concrete production as a value-added product that can increase the overall demand for concrete in the marketplace.

"The extensive experience and depth of technical service and support offered through this alliance provides competitive advantages to concrete producers," remarked Phil Arnold, President and CEO of Scofield. "Moreover, the expanded and unique color range, functionality and performance of architectural concrete produced using CHROMIX® Admixtures for Color-Conditioned Concrete™ offers new design and business opportunities for the concrete industry."

"The new liquid coloring admixtures exhibit superior performance characteristics and eliminate many of the concerns that ready mix and precast producers have with liquid systems," explained Mr. Shydrowski. "The new system of measuring equipment and product advancements provide color stability, reliability and permanence, as well as production accuracy and efficiencies unequaled by any liquid color measuring approach currently available."

We hope that the combination of these new technologies and the Master Builders and Scofield alliance will help to move colored concrete from a niche to a mainstream market opportunity."

For additional information, visit the company websites at www.masterbuilders.com or www.scofield.com.

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CIRCLE #74 ON READER SERVICE CARD

Industry Spotlight

Concrete Furniture Market Expanding Rapidly

By now the booming market for concrete countertops is well known. Architects and designers are well versed in concrete's ability to contribute to the cool, natural look that is in such demand. What is not as well known is the growing popularity of concrete furniture pieces some of North America's most creative craftsmen are creating.

"People want to have something they can show off, not something that mimics what their friends or neighbors have," according to Terry Stogner, owner and founder of Concrete Interiors in Alamo, California. In addition, concrete can be designed in options, straight, curved, or freeform; a variety of edge treatments are possible; surface treatments such as textures and inlays can be used; and the concrete can be tailored to compliment glass, metal, or wood. "And if you break outside the standard mold with concrete, the cost does not go up dramatically," he said.

Beau Hibdon of Elements of Time in Redmond, Oregon, got his start in furniture when customers he was building a patio for asked him to build the furniture to go with it. "I started using different materials over boards and pieces of



plywood. I'd use stains and stamps. When I started showing what I could do, people didn't believe it."

Today, the gallery he owns with partner Dave Anderson boasts beautiful

furniture that lures customer after customer. Hibdon says requests for furniture are common these days. In fact, three "high-end" stores are interested in their work.

Cheng Design in Berkeley, California, is known internationally for its innovative design work in kitchens, bathrooms, and custom homes. The use of concrete is abundant. "I have an art background and I was always trying to be inventive," said Futung Cheng, whose mother was a color artist at the Walt Disney Studios. Three of his brothers are professional artists. Cheng was immediately drawn to the virtues of concrete. "It is easily



sculpted, it takes any guise, and it mimics whatever ask it to be," he said.

Cheng design has introduced a new Geocrete Pangea Series Workstation, a module that plugs into a new or existing kitchen.



The Workstations are designed around specific functions like pastry making, brass or stainless trivets to be designed near a cook top, fitted cutting boards or chopping blocks and integral fruit bowls.

As each day passes more and more owners, designers, and builders realize the possibilities of concrete for custom furniture pieces — this market is poised to continue growing and become more creative.



About The Concrete Network (www.concretenetwork.com): Founded in 1999, The Concrete Network serves architects, builders, designers, consumers, and remodelers with over 1,500 pages of concrete information and local service providers for concrete countertops, stamped concrete, acid-etch staining, concrete resurfacing, and 43 other types of concrete work. Jim Peterson is Founder and President.



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CIRCLE #32 ON READER SERVICE CARD

The Secrets of Concrete Countertops

By Susan Brimo-Cox



Cast in place concrete countertop
installation by Dave Pettigrew,
Diamond D Company.
Kitchen Design by Marty Fiorovich



Handcrafted and distinctly unique, concrete countertops are finding their way into more and more homes and commercial venues. The versatility of the medium, as well as its unpredictability, is part of the attraction. It's a growing trend and proving to be a boon to concrete artists.

Jeffrey Girard, owner of FormWorks L.L.C. in Cary, North Carolina, says, "The number one feature of concrete countertops is that they are completely customizable — any shape, size, thickness, embedded items. If a client wants cobalt blue, I can give it to them. If they want something that looks like a beach with seashells and beach glass, I can do it."

"Concrete can give a real 'Old World' feel," observes Tom Ralston, owner of Tom Ralston Concrete in Santa Cruz, California. "It's one of the most unique surfaces in that no one else will have exactly the same thing." Ralston has embedded seashells, exposed the aggregate, hand troweled a finish, polished the surface, and sand- and glass-blasted the surface, all to achieve different effects.

Stuart Zumpfe, president of Concrete Effects Inc. in Langhorne, Pennsylvania, has impressed real ivy leaves, used traditional stamping skins, and embedded coins and custom tiles into countertop surfaces for distinct results. On one job, he reports, he sprinkled titanium dioxide on the surface before sealing to achieve a gold-flecked look.

Various contractors also use integral color, acid stains, color hardeners and micro-toppings. There is virtually no limit to what you can create.

Want to know a secret?

Mix designs, construction techniques and surface treatments vary from one concrete countertop fabricator to another, and many closely guard their proprietary methods as trade secrets. But for those curious to learn more about crafting concrete countertops, there are some basics. For example, concrete countertops are either cast-in-place or pre-cast and installed after

Manufacturing time for pre-cast countertops can run six to seven weeks, but is generally five weeks, according to Smith. Forming and templating time takes about a week. Curing takes four weeks.

curing. Advocates for each method cite various benefits.

Dave Pettigrew, owner of Diamond D Company in Watsonville, California, pours concrete countertops in place. "I like to pour-in-place because I can form the countertop to anyone's particular needs — radius edges, curved corners." Because he pours the countertops in-place, Pettigrew says he doesn't pour with joints. "We put plastic over the cabinets, we pour one-and-a-half inch thick, and we tell the customer we have to have control of it for 10 days." Having control for proper curing is important.

"Sometimes form-setting on finished cabinetry is challenging," reports Ralston, who also pours in-place. He also says "working within the framework of people's schedules — scheduling with the cabinet installer, plumber, electrician, and dry-wall installer — especially on a remodeling project, can be tricky."

Zumpfe pours in-place and borrows a trick from pool installers for nice rounded edges, he uses coping profile form liners.

If you want control, however, pre-cast is probably the way to go. When you pre-cast "you can control everything about the structure — the environment, temperature, curing time and how it cures," explains Karen Smith, sales and marketing director for

Countercast Designs Inc. outside of Vancouver, British Columbia. Another upside to pre-casting is that you can incorporate integral sinks into the countertop. "You can't do that when you pour-in-place," she says, "because [when you pre-cast] everything can be accessed from all sides."

Manufacturing time for pre-cast countertops can run six to seven weeks, but is generally five weeks, according to Smith. Forming and templating time takes about a week. Curing takes four weeks. Seams in pre-cast countertops can become part of the design. Generally, a silicon or latex caulk is used.

Girard, who is also a professional civil engineer, says the quality of the final product depends on how well the concrete is mixed, poured and cured. He advises, "Most concrete is used for structural applications. Countertops are structural and need to be approached that way."

Another advantage to pre-cast is the ability to ship product to faraway locations, though shipping costs can be a limiting factor.

As Pettigrew points out, quantity may be the deciding factor for many contractors. "We do maybe three or four concrete countertops a month, so we pour-in-place. If I did 25 a month, I might pre-cast."

Mum's the word

Concrete countertop manufacturers — pour-in-place and pre-cast alike — obtain their materials from standard sources, such as concrete suppliers, ready-mix producers and stucco suppliers. Exactly what goes into the individual mixes, however, is not shared information.

For most contractors there was a good deal of painstaking experimentation before the "ideal" concrete countertop mix design was achieved. With such an intense learning curve, one can easily forgive the hesitancy to share. "You don't get to practice much," says Pettigrew. "Once we got the basics down, then we began refining it." Pettigrew generally has a ready mix

plant prepare his concrete according to his specifications, but, if the job is a small one, he'll mix the batch himself right on the site. His topping mud is also a secret. "It's my 'secret sauce,'" he says.

Additives might include polymers and plasticizers. Ralston sticks with half-inch angular rock aggregate and pours as stiff a mix as he can.

For reinforcement, more than one material is often used. Zumpfe says he

uses fiberglass in his mix for strength and to reduce shrinkage. In the form he often uses vinyl-coated wire shelving, which he places upside-down, or welded wire. Ralston uses stealth fiber mesh (like little strings) and fibrillated fiber mesh (like netting). Sometimes, around sinks for drainage or next to stovetops as hot pot rests, contractors will partially embed metal bars — stainless steel, brass or bronze.

This example of a precast concrete countertop by James Humber is simple in design. However, it shows off a dramatic granite look simply by adding the right stuff to your mix.

Photograph Courtesy James Humber, Indesigns Decorative Concrete

You could say every concrete countertop is made from custom-made concrete and you wouldn't be wrong. Smith observes, "Everyone uses different things and most [contractors/manufacturers] keep their method under wraps."

My lips are sealed

No less important than any other step is the sealer. "The sealer sustains the countertop, makes it still great looking in five to 10 years. That's what separates the men from the boys," admonishes Smith, who's firm uses a water-based, USDA-approved sealer that is absorbed into the pores of the concrete. "It doesn't leave a [visible] coating, so the surface looks and feels like stone," she explains.

Ralston says different sealers give you different looks. "Acrylic waxes have a matted appearance. Silicon-impregnated sealers look natural. Polyurethane epoxies have a high gloss." Which sealer he uses depends on what the client wants.

In kitchen situations, a sealer that is compatible with food use is desirable. Tim Sherry, northeast regional sales manager for Increte Systems, says Increte's Counter Kote is an FDA-approved epoxy, designed to go on thick. He says Increte's Dura-gloss, also FDA-approved and originally designed for use on floors, is a thinner water-based epoxy that also works well on countertops. Bomanite's Florthane is an FDA-approved, highly chemical-resistant urethane sealer. Chris Stewart, Bomanite's director of technical services, says Florthane is available in water-borne and solvent-borne formulas. Seal Hard, by L&M Construction Chemicals in Omaha, Nebraska, is a USDA-approved hardener/densifier. Stu Wood, chemist at L&M, explains that Seal Hard penetrates the surface of the concrete and, through a chemical ion-exchange, bonds with the concrete, plugging up pores and crevices.

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and commercial businesses. While the materials are inexpensive, concrete countertops are cost-competitive with high-end solid surface products and some natural stone products, such as granite, because of all the skill and labor that goes into creating them — figure \$65 to \$125 per square foot.

“For someone who wanted to get into making them, experimentation is the first step, but you have to know what you’re doing,” cautions Girard. “It’s too easy to make a concrete countertop — it’s difficult to make a good one. Durability depends on who makes them. The more experienced the fabricator, the better.”

The well-known durability of concrete notwithstanding, concrete countertops can crack and be damaged. Dropping a cast iron pot may cause chipping or break an edge. However such an event is likely to damage other countertop materials, as well. Heat, abrasives, sharp knives, the strong colors and acid or base properties of foods are all a concern, but more for the sealer than the concrete itself.

As Smith observes, with repairs “you’ll never completely match 101 percent, it may be slightly different, but you’re not dealing with something that needs to be computer-matched.” Variations in coloration and embedded objects help hide stains. Zumpfe points out if you use a high-build epoxy resin sealer, scratches and wear marks can be sanded and recoated. Or, as with other classic materials — good leather, wood or natural stone — imperfections add character.

“One of the most challenging things about working on a concrete countertop is that it’s like working on a piece of furniture,” Ralston reflects. “Everything is brought up to your focal point and it’s constantly under scrutiny. You almost need an artisan to do this work.” Indeed. That appears to be the biggest secret of all.



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CIRCLE #52 ON READER SERVICE CARD

Robert J. Harris II: A hard-working man with a soft side

By Stacey Enesey Klemenc

After serving his obligatory stint in the military in the mid-'50s, Robert J. Harris studied engineering at Stockton College for two years. Pursuing a degree and supporting a developing family didn't quite mesh, so he switched career paths — a move he has never regretted — and went on to complete a three-year apprenticeship in Oakland, becoming a bona fide union cement mason in the San Francisco Bay Area in 1960.

From there, the journeyman worked his way up to foreman for various companies and then superintendent. By 1972, he had formed his own company, Harris and Harris, which



From left: Robert Harris III, sister Lori Harris, and their father Robert Harris II.

largely focused on public works projects involving bridges, dams and freeways throughout the state of California. The Class A general engineering contractor also has been involved in myriad private endeavors, everything from skateboard parks and underground cemetery vaults to tilt-up concrete and entire commercial complexes.

Harris, who now lives in Northern California's Brentwood, says his construction career goes way back. When he was 5 or 6 years old, his dad, Robert J. Harris Sr. — "who was a damn dam builder" — began to teach him how to operate heavy equipment. "Just like a farmer is out there with his kids on a tractor, when their legs are long enough to reach the pedals, he was teaching me what that lever was for, what this one did," Harris recalls about his first outing to the Mojave Desert. "I became familiar with the jargon and technology at a very early age."

When he was 13 years old, he joined the labor union and helped his father with a road project in Montana. "I was an independent child," he says. "I loved running through the forest and going down rivers and exploring on my own. I wasn't a loner — I had friends and all — I just liked doing things by myself. And I still enjoy my own company today," as well as the company of his family. He and his wife, Mary Lou, have three children: Nancy, Lori and Bob.

When Harris' son, Robert P., got old enough, he accompanied him on side jobs that he'd do on weekends. Harris says young Bob — who now is director of product training for the Scofield Institute, the educational arm of L.M. Scofield Co., in Douglasville, Georgia — used to carry stakes and lumber and help him build patios, backyard retaining walls and such whenever he could. From the time his son was a teenager into his young adult years, they often worked together on various projects.

The one thing the younger Harris says sticks out in his mind during these formative years was how hard it was being the boss' son. "It was 10 times more difficult than what it was for the

average employee," he says. His dad expected (and still expects) perfection and always pushed him to do his best. Although he concedes it took him years to appreciate his father's drive ("I just thought he was kind of cantankerous at the time"), he's thankful his dad taught him to take pride in his work and to be proud of his trade and the industry as a whole.

All three Robert Harris have been marked by this "driven" trait. "Bob would probably agree my father [Robert Sr., who passed away years ago] was an extremely hard taskmaster. He demanded an honest day's work out of anybody that worked for him and I do the same. I think that's a good work ethic. I've made a few enemies in my life but I've made many more friends and associates," the elder Harris says. "The same ethics that were instilled in me, I've instilled in my son. And that's really paid off for him. Bob is probably one of the premier stainers and decorative floor finishers in the world."

Bob attributes much of his success to his father's influence. He remembers some sage advice he gave him a long time ago: "If you get to the upper echelon you can take your skill and go anywhere you want. And that's what I've done," says the younger Harris, who has conducted seminars everywhere from South Africa to Spain and beyond. "His words of wisdom are now reality."

The elder Harris also believes that staying on schedule is probably the most crucial aspect of any job. "I've built a lot of things in the last 35-40 years. And I've built them all on time and on schedule," he says. To be successful time and time again, "Put your work schedule on a graph and follow it to a T." As for judging the quality of workmanship, Harris believes it's a learning process not an inherent trait. It will come in time.

As a whole, concrete masonry has been a rewarding career, says Harris. He says he's living comfortably and continues to work because he wants to, not because he has to. In addition to small jobs for local cities and counties, he's also dabbling in the decorative

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Robert Harris II with his grandson. Could Robby become the fourth generation concrete finisher?

concrete arena, staining and stamping friends' and neighbors' garage floors, patios and the like — something his son taught *him* to do.

"I love the out of doors and I like making things and I don't mind getting

dirty when I do," Harris says, noting: "When the concrete trucks pull up, it's like the start of the football game. I get like an adrenaline rush."

As far as young people starting out, he says cement masonry is a pretty

good career choice. "Many young people have started with my company and have branched off on their own," says Harris. "It keeps you healthy because it's extremely hard work. And if I had it to do all over again, I'd do the same thing. Only I would have profited more if I knew then what I know now," he adds with a laugh.

According to his son, Harris has always been willing to help people who needed a break in life. He'd offer them a chance to have a career and an opportunity to better themselves. "My father has always been and will always be a workaholic," the younger Harris says. "He's a very driven man who stays extremely focused. He sets goals and does whatever it takes to achieve those goals. All of us [Robert Harris] are workaholics. I don't know if that's a good thing or a bad thing. We like our work. No, like is an understatement. We love what we do."



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Determining the best mix design for decorative concrete is like creating a recipe for a gourmet treat — it should take advantage of the best qualities of the various ingredients in it to produce the specific product for your needs. When it comes right down to it, according to Kelly Idiart, vice president customer service, Central Concrete, San Jose, California, good quality concrete is the same for both decor and nondecor applications. Much is dependent on job site conditions, with their specific moisture levels, subgrades, finishes and cure practices.

More specifically, mix design for decor will vary depending on the region of the country, the site, and the type of finish the project will receive, says Ward Malisch, Senior Managing Director, Technical Operations, the American Concrete Institute (ACI), Farmington Hills, Michigan. On general principles, he says, there is no one-size-fits-all mix design. He suggests that a good mix take into account three elements:

- 1) the properties of the concrete in its plastic state as it comes out of the truck,
- 2) the finished concrete's strength to withstand loads and durability to withstand freeze and thaw cycles, and
- 3) economics — how expensive it is. If it is possible, he says, reduce the amount of raw materials used as much as possible while retaining strength and durability.

It all begins with proportion, says Malisch, getting the right ratios of each ingredient. Concrete is made of cement and water to form a binding agent, and then sand and aggregate that provide its substance. Admixtures are used to provide special qualities, and these can include either water reducers of varying capabilities or set modifiers. Finally, air entrainment products and fibers add strength and durability, while color gives a special aesthetic. Each one plays



Recipe for Success

by Cindy Grawl

a role in making the concrete both beautiful and long-lasting. Here's how:

Cement

The first ingredient in concrete is portland cement, which is typically 10% to 15% of the mix by volume. ASTM C150 lists eight types of cement that offer a variety of performance benefits to concrete. Three of the most common types are Type I, for normal concrete, Type II, offering moderate sulfate resistance, and Type III, for fast setting and high early strength applications. Portland cements now come in blends that can meet more than one ASTM specification.

Fly ash, one of the mineral admixtures, can replace from 18% to 20% of the cement in the mix, resulting in a slower set. Fly ash also tends to decrease early age compressive strength, but it typically increases late age strength. One main advantage of fly ash is that it lowers concrete cost because it is cheaper than cement. According to Don

Skundrick, Liniger's Tru Mix, head of operations, Medford, Oregon, fly ash in decor mixes reacts with lime to hold down leaching, which can result in unsightly deposits. It is important to note that not all fly ash is suitable for concrete. Improper usage can even cause surface flaking on color hardened concrete applications.

Water

Water is the catalyst that hydrates the cement and makes the mixture workable. For complete cement hydration, a water-to-cement ratio of 0.19 to 0.22 is needed. However, to make the concrete workable, the w/c ratio ranges from 0.40 to 0.60. Concrete consistency, as it relates to its fluidity or mobility, is determined by its slump. Slump is not a measure of the workability of concrete. Rather, the higher the slump value, the more mobile the mixture. The method for determining slump is described in ASTM C143. Slump should be maintained throughout the pour, and admixtures can be used to do this.

When determining the mix proportions for a cubic yard of concrete, the w/c ratio (which is related to the durability compressive strength) and the maximum size of the aggregate first need to be determined. In the absence of historical performance with a given set of materials, ACI 211 provides relational tables and additional information for proportioning a concrete mixture.

"Keeping the water-to-cement ratio right is the number one rule for mix design," says Skundrick. "Use as little water as possible, as this affects the quality of the concrete." The excess of water will cause excessive bleed water as the concrete begins to cure, he says, and thus the substance will shrink. Using too much water also risks the surface color. Superplasticizers and other admixtures can be used in place of water to reduce the amount used.

Aggregates

In decor uses, the size and the shape of aggregates used in the mix design are important, says Malisch. Each contractor has an opinion about particle size, and many say it depends on what kind of finish will be used.

Here is the conundrum. In decor, texture and pattern are vital, and they are affected by the size aggregate used. The deeper the stamped impression is to be, the smaller the stone needed, but the smaller the stone, the more cement is needed, and thus the more water required.

According to Tom Ralston, president of Ralston Concrete, Santa Cruz, California, using a smaller pea gravel means you have to make up for the reduced solid mass with sand, increasing the need for water and thus reducing structural integrity. While the $\frac{3}{8}$ " inch aggregate promotes clean edges when stamping with rubber or aluminum stamps, he says, the use of a larger angular rock improves strength and the rocks have a better tendency to interlock, reducing cracking. He says the only time a larger aggregate is difficult for stamping is when the aluminum or rubber stamps are used. He suggests using $\frac{3}{4}$ " angular aggregate with all polyurethane texture mat stamps to help overcome some of the shrinkage problems.

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Skundrick believes that with stamped applications, a smaller rock, a $\frac{3}{8}$ ", should be used, compensating with a higher cement content and a 45% aggregate to 55% sand ratio, just the opposite from a normal mix. He advises using plenty of matrix to get the detail needed on stamped applications.

Idiart also suggests a smaller-sized aggregate be used to help enhance the stamping impression, but mixing it with a larger size to enhance durability and quality.

Round or water tumbled rock is seen only in some areas of the country, and it is considered best in exposed designs.

Admixtures

Admixtures are used to customize just the right mix for a specific job, climate, and site, to control the set and to add durability. Common admixture types are classified in ASTM C494 and include water reducers, accelerators, and retarders.

Water reducers act as the name suggests: they either lower water demand while maintaining slump or they can be used to increase the slump without the need for additional water. Some provide set control in addition to water reduction and act as either accelerators or retarders. Different types of water reducers impart different amounts of water reduction, typically from about 3% to 10%. High-Range water reducing admixtures or superplasticizers offer the highest level of water reducing capability, typically ranging from 12% to about 25%. Ralston notes that superplasticizers increase slump without adding water.

Accelerators as defined by ASTM C494 as "an admixture that accelerates the setting and early strength development of concrete." They may or may not provide water reduction as well. They primarily allow concrete to maintain an even set when there is a temperature differentiation.

Using these admixtures in combination must be done carefully, as they can offset each other, even from the same manufacturer, so get advice before getting carried away. Says Ralston, "If you use admixtures indiscriminately, using too much retardant for example, it can wreak havoc, delay your setup and create a spongy effect."

Giving the mix the opposite effect are the retarders. These admixtures slow the rate of setting and are sometimes used to offset the accelerating effect of hot weather or to delay the set, allowing for special finishing processes, which may often times increase strength. Admixtures are usually dosed in fluid ounces for every 100 pounds of cement per cubic yard of concrete.

Air Entrainment

The design must result in a durable concrete that can stand up to freeze-thaw cycles in wintry climates. This is accomplished through the use of air entrainment, either from using air-entraining cement or from air-entraining admixtures, described in ASTM C260. The microscopic voids provided by air entrainment allow space for frozen water to expand so it won't fracture the concrete. The need for air entrainment, says Malisch, varies from region to region, running from 3% to 7% of the volume of the concrete.

Skundrick notes that air entrainment additives can make a finish sticky, but the solutions to this lie with the finishing process, not with a change in mix design.

Ralston suggests that contractors look into the use of such materials as acrylic polymers, which help increase a mix's adherence to old concrete and improve concrete's flexibility. Such polymers, says Ralston, mean a lower water-to-cement ratio and help reduce shrinkage as the plastic fills these interstitial voids. "As the industry develops," he says, "modified acrylics and latex additives will become more important in mix designs as we strive for sophisticated applications. Tinkering with these admixtures will mean we will begin to see some awesome things."

Fiber

For inhibiting plastic shrinkage and plastic settlement cracking, there are two common types of synthetic fiber, a monofilament nylon fiber and a monofilament fiber or fibrillated tape polypropylene, can be used to provide a three-dimensional secondary reinforcement to decorative concrete. These products are available in pre-weighed degradable bags and are introduced into the ready mix at the rate of from 1.0 to 1.5 pounds per cubic yard.

The advantages of using synthetic fibers are directly related to concrete durability, according to Bob Zellers, PE, vice

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president of technology and engineering at NyCon, Westerly, Rhode Island. Synthetic fibers control plastic shrinkage cracking, increase toughness and impact resistance, and reduce water migration. None of these benefits could earlier be obtained from the older approach with wire mesh, a secondary reinforcement.

Zellers says that synthetic fibers keep shrinkage at bay and improve durability by helping the finish stand up to surface abrasion. "Every contractor has a preference for nylon or polypropylene," he says. "It's like Fords vs. Chevys." One thing is certain however, the shorter micron-fiber is most suitable for decorative concrete. Longer fibers will generally stick up on the surface of the finished concrete but can be easily burned off with a torch to maintain the aesthetic appearance with colorful textured or stamped concrete finishes.

Color

In addition to texture, it is color that sets the hallmark for decor applications. "With color, concrete becomes a piece of art," says Ralston. "But it is the trickiest, most difficult part of the mix." Clients, he says, expect the finish to look like painted substrate, and they must be taught that it will have a natural, variegated effect caused by the many elements in the mix.

There are two methods for adding color to concrete. One method of coloration is through the use of integral color or iron oxide pigments added to concrete, never more than 10% by weight. The second method uses color only on the top

layer, adding some labor cost but generally decreasing the cost of color throughout.

Frank Piccolo, of the Decorative Concrete Council and Natchitoches, Louisiana's Artcrete, Inc., says that different concrete contractors prefer different kinds of coloration. "Opinions are like belly buttons," he says. "Everybody has one." Some contractors use only integral color, and others prefer a dry shake, thinking it gives a richer color without fading out. Still others will even use a combination of both integral and topical coloring applications.

Malisch says that integral color is expensive and liable to vary from pour to pour, but Skundrick suggests that the cost is higher only for reds, greens, blues and darker colors, that integral earth tones are generally a better value.

"Integral colors were the hardest to use," says Ralston, but many companies have now gone to liquid systems over the dry powders, added by computer rather than an individual driver, so consistency is now greatly enhanced.

Adds Idiart, the new liquid systems are "the wave of the future," offering ease of application as well as consistency.

Strength

The industry standard for comprehensive strength of concrete is measurement performed at 28 days. Some 3,500-4,000 psi is considered acceptable for decor uses.

According to Piccolo, top applied color hardeners, which include wetting agents, were developed to allow a higher speci-

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cation for PSI in industrial uses, creating abrasion resistance at lower cost as they can strengthen concrete surfaces two to three times higher than the standard compressive strength. However, he says, nowadays color hardeners are used in the decorative concrete to enhance aesthetics.

"PSI is not as important in decor," adds Skundrick. "You strive to get a high quality surface, and color hardeners simply give concrete that unique natural stone appearance. Because of color hardeners strengthening qualities however, it does make the top of the concrete very resilient to foot or wheel traffic and repairing damage to color hardened concrete is quicker and easier to blend with the existing surface."

Decor

What it all comes down to is that each contractor must construct his own basic recipe for a mix design to meet his climate, site and aesthetic needs. Frank Rusk, a Las Vegas-based contractor turned consultant, says that he came up with his own mix design, adapting it with the help of a ready-mix supplier. He starts with a Type V cement as it is resistant to the attack from minerals in soil and water, and does not use fly ash, as it causes splotching.

For stamping applications, he advises a 5.5 to 6.5 bag per cubic yard ratio, with a 50/50 sand and aggregate ratio, and a 3/4-inch aggregate. In exposed aggregate applications, he advises a 70/30 or 60/40 sand-to-aggregate ratio, with a 3/8-inch rounded aggregate used. He uses integral color, sprayed with a nationally

recognized surface etching product. And because sun and shade will cause the concrete to cure irregularly, colors can also develop differently. Therefore, he suggests covering the surface with a 6-mil black plastic overnight then returning the next morning and pressure washing the surface several times. For stamping applications that require a more production oriented environment he suggests running lights and adding color hardeners at night to achieve a more consistent color.

Decorative concrete contractors can work with ready mix producers by describing what they want to happen with the mix and then working together to find the best way to achieve it. Ultimately, Malisch advises doing a preliminary mix and then tweaking it to come up with the right proportions for that site application.

Piccolo adds that help is available on-line, The American Society of Concrete Contractors, he says, which the Decorative Concrete Council is part of, has a hotline for members that will answer technical questions about mix design. Contractors can also get help from such resources as at the Scofield Institute, ACI, Portland Cement Association and the National Ready Mix Concrete Association.

In short, mix design, though it is based on scientific properties, is as much a matter of art as of science. Like a great chef, each contractor will bring his own expertise and insight into the recipe.



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Havalia Concrete Tools Inc. New Magnesium Beveling Hand Tool

On display for the first time at this year's World of Concrete show. The new magnesium "beveling" hand tool is designed to slope the concrete edge under overhead garage doors keeping water from flowing into the building.

Traditionally, finishers would have to devise some type of jig or lower the front form and use a straight edge of some type. This timely and cumbersome task and often results with an inconsistent and straight bevel under the door. The beveling hand tool is designed to take the guess work out of this application and allows less experienced workers to quickly and easily form straight beveled edges while maintaining a consistent elevation.

The tool is designed for standard 2" x 4" framing with the bevel line starting 1" behind the overhead door. It provides an 8" bevel from slab grade to 3/4" depth. The tool is designed with a small that allows it to slide smoothly along the form. Header forms are easily positioned differently for use of the tool with heavier framing on jobs so the bevel line starts at the proper location.

The new Magnesium beveling hand tool is currently available at Havalia Concrete Tools, Inc. Please call 1-800-835-0191.



convenient for outdoor applications. The removable handle collapses to 44" for tight spaces or extends to 66" for a further reach onto the fresh overlayment. The 34" trowel can quickly be reduced to 25" by changing the guard and blades. The two sizes of blades are available in a number of different materials for specific applications.

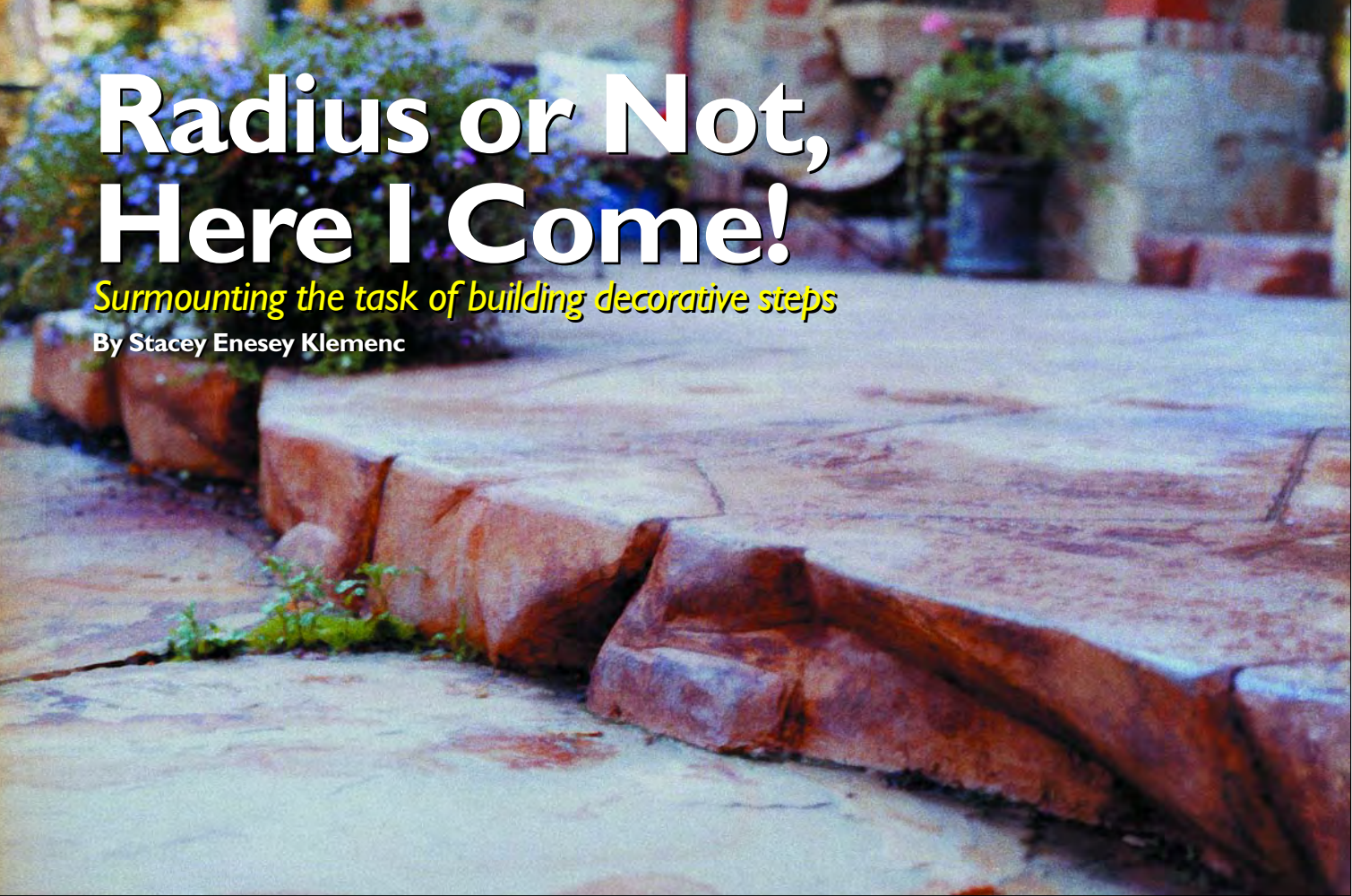
For information on the Hover Trowel please visit www.hovertrowel.com or call (610) 856-1961. The HoverTrowel is distributed by Wagman Metal Products. Visit www.wagman-metal.com/epoxy or call (800) 233-9461 for Wagman's 2002 Polymer Flooring Equipment and Supply Catalog.

Radius or Not, Here I Come!

Surmounting the task of building decorative steps

By Stacey Enesey Klemenc

Photograph Courtesy of Devin Johnson, Pool Specialties



Ask most contractors and they'll tell you that they'd rather pour thousands of feet of concrete than build one 20-by-4-foot staircase — let alone a radius one. The day of the pour, many will readily admit that there's a knot in their stomach and that they wish the day had already come and gone... and left behind a perfect set of stairs.

Whereas a time machine doesn't exist, there are a few products on the market today designed to make the hard task of building decorative stairways a little easier.

Fancy stepping

Contractors may be familiar with one such product — namely Step Liners — made by Stegmeier L.L.C., headquartered in Arlington, Texas. The company also has a manufacturing plant in Henderson, Nevada, right outside of Las Vegas.

"These are foam forms that adhere to the inside of formwork to create architectural profiles that match

cantilevered edges of swimming pools," says Bud Stegmeier, western division manager and son of the founder of the company. Basically, they're used to mold a fancy edge on one step or a whole staircase. They're not only easier to use, he contends, but they're also quicker.

"When you form steps out of wood, that wood is dense material. Water doesn't penetrate it and it takes longer for the steps to set up," he explains. "Step Liners are made of a porous material that will accept bleed water. This allows them to be stripped much, much earlier than conventional wood or steel step forms."

And because the liners are porous, they don't create suction. Unlike wooden forms that often pull little patches of concrete along with them, the foam forms let loose and will strip with very little finishing to be done.

"I was a contractor for a long time," states Stegmeier. "And sometimes — if the customer didn't want to spend the extra money — I'd use these Step Liners anyway and not charge them.

Why? Because the steps stripped so much cleaner and the process saved me so much more labor."

Step Liners are available in six profiles, with the one called "Safety Tread" worth its weight in gold, Stegmeier claims. If an architect specifies radius steps that have angled risers, which some counties and cities require on commercial buildings, "It can be a nightmare to build," he notes. But a contractor can shape the forms into the desired radius and nail them to "straight up and down, plumb" formwork.

Stegmeier says these forms can be used for virtually any radius. Fiberglass reinforced strapping tape is applied on the side opposite the direction of the intended bend. The bending tape prevents the form from breaking on one side while allowing a radius to be compressed into the other side, he explains.

These one-time-use, expanded polystyrene forms are available in 4- and 8-foot lengths. Each form comes with its own disposable foam tool.

"Since the forms can be stripped away so early, finishing usually involves misting the surface with a spray bottle and going over it with these tools," says Stegmeier. "The foam profile tool doesn't leave chatter marks like some metal tools do. It has a soft edge and it gives a clean finish."

It's all in the form

According to Tim Wilson, general manager of Pacific Concrete Images in Laguna Hills, California, one of his company's newest products "will bend into a 2-foot radius with no problem. Other forms are limited to the radius you can cut."

Pacific Formliners, reuseable polyethylene forms designed to help contractors create stairs, have been on the market for about two years. "Our formliners are easy to flex, easy to cut, thus making them very versatile and easy to handle on the job," Wilson maintains.

On average, he says, you'll get eight to 10 uses out of each Pacific Formliner, which typically sells for \$3.50 a foot.



Photograph Courtesy of Polystone

Versaliner, a step form liner from Polystone Products that's touted to take the guesswork out of texturizing vertical concrete surfaces, eliminates the strip and texture method associated with building textured concrete stairs.

They're available in seven standard profiles, each with matching finishing tools made out of stainless steel. The forms come 9-feet long, 2-inches thick and either 6- or 7-inches tall. Custom forms up to 24-inches tall also are available as a special order.

Most contractors like the product because it's reusable, Wilson says. "And if you're doing radius steps, it's definitely easier to form the radius with a

Formliner. You don't have to cut anything; you just have to bend it."

Usually, Wilson explains, contractors nail the Formliner to the inside of the wooden formwork. No release agent is necessary except you should spray the form with water before you pour the concrete. "Some people use a spray vegetable oil instead of water," he says. "This makes it easier to strip the form away." You can start at one end and



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work it off a little at a time, he adds, instead of pulling off the form all at once. It leaves a smooth, easy-to-finish surface, he says.

Look! Wood be gone

Plastiforms, another innovative product that can make building stairs easier, are plastic boards designed to replace their wooden formwork counterparts. Made out of lightweight high-density polyethylene with UV inhibitors, the boards feature end connectors that allow them to be attached together with just a snap. No nails are needed.

Contractors like them, says Mike Lane, president of The Plastiform Co., because they're so easy to use and because they last so long. "We've got a 10-year club going," he says with a laugh. And that's about how long they've been around.

"They're very quick to set up because of the camlock clamp that we use," he explains. "There's a dovetail shape slot that runs the length of the board which allows the clamp to be installed

There's a Pattern Here

Concrete steps can be the centerpiece of a house's façade and a showpiece of the decorative concrete craft.

Doug Bannister of The Stamp Store in Oklahoma City offers a couple of suggestions for patterning stairs. First, a landing or walk patterned to simulate small tiles or blocks should be separated from the stairway by a pattern of larger stones or tiles. This creates a visual and texture boundary that alerts people to the coming change in elevation so they won't trip. Such a border also adds realism to the texture because in real stonework, edges and curbs are made of larger stones or blocks that aren't dislodged as easily as small blocks.

For the same reason, Bannister also suggests using skins to make the treads look like one or two big slabs of slate or sandstone rather than tooling them to look like blocks. Not only does this offer a level surface to walkers, but it also reflects how a stonemason would actually construct stairs.

Mark Foreman of Bomanite in Roseville, California, agrees that steps should be highlighted in a contrasting color from the walkway for safety. Instead of integral color or acid stain, Foreman prefers to make a slurry of color hardener and apply it as a plaster while the underlying concrete is still curing. The earlier the slurry is applied, the stronger the bond it forms with the concrete, although Foreman says he's never had a delamination problem.

This method offers several advantages over integral color or acid staining. The slurry is comparable in hardness to a 7.2-sack concrete mix, so it holds up well under pedestrian traffic. The color comes out even, with a minimum of dusting or mottling. It's easy to texture the material. And if the underlying concrete needs to be cut to repair a pipe or something, it's easy to patch it with more color hardener and match the surrounding material.

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Photographs Courtesy of Stegmeier LLC



Step Liners from Stegmeier may be stripped much earlier than conventional forms because they are made from a porous material that will accept bleed water, allowing the concrete to set up much faster.

anywhere by twisting it 90 degrees. For elevation changes, you just loosen the clamp and move the form up or down. It takes just a second."

Contractors also have noted that the forms are time-savers. "I like the forms because I can strip them after four hours instead of going back the next day," says Ron Clausen of CCC Construction in Carroll, Iowa.

The Plastiform boards are great for free-forming curved and radius work, Lane adds. The 2-by-4s will accommodate a 3-foot bend radius, while the 2-by-6s can be bent into a 4-foot radius. The boards can be stacked for radius work.

Currently, the boards are available in three widths — 3½, 4 and 6 inches — and 12- and 15-foot lengths. In April, the company also plans to offer forms that are 8-, 10- and 12-inches wide.

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(Continued on page 41)

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The Pentagon

by Christianna McCausland

September 11 changed the way we perceive ourselves as a nation. En masse, we watched, horrified, as the very structures of our freedom were shaken to the ground leaving fear and insecurity hanging in the air like dust motes. Even when the dust began to settle, the sense of horror was replaced by something equal as disturbing but more intangible — the feeling of helplessness.

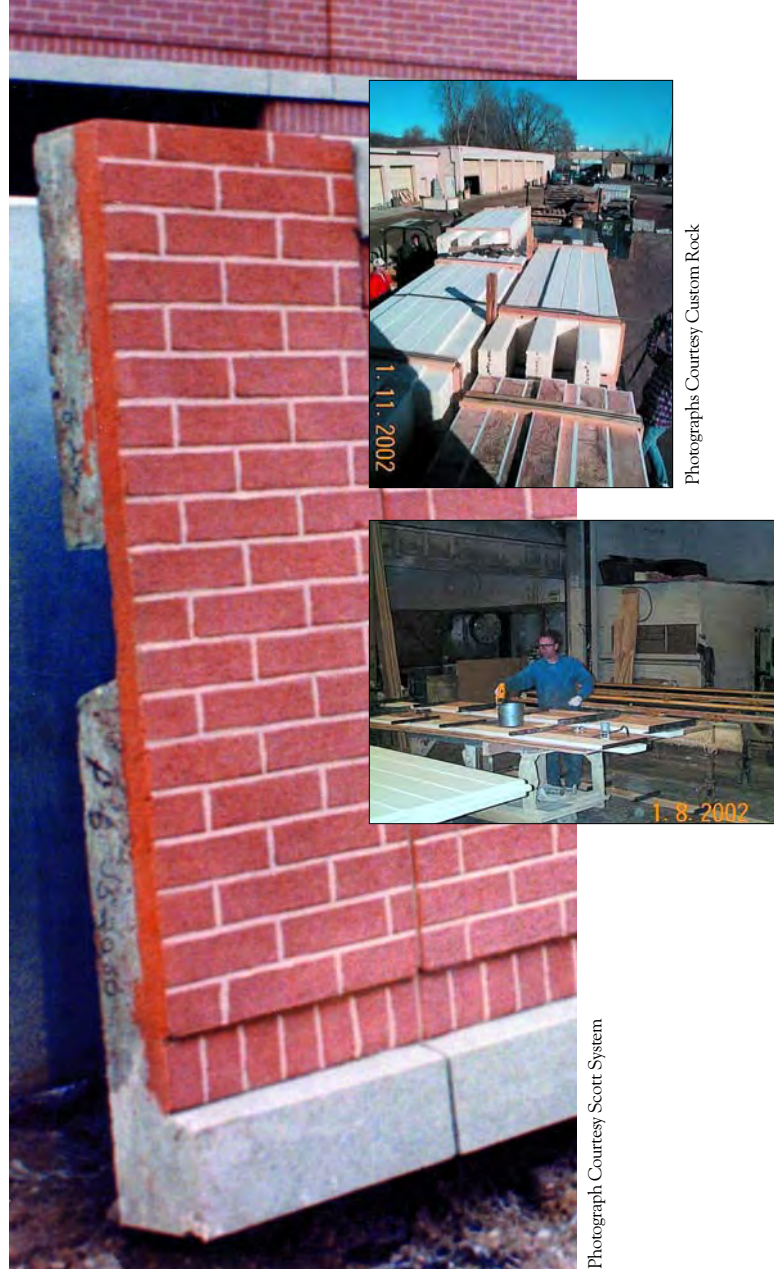
As the nation came to terms with their grief and outrage, others stepped into the debris and began to clear a path for rebirth in hopes that by rebuilding the physical structures that had been destroyed, some part of the American psyche may be patched as well. For those who contributed to this labor, and continue to do so, the work was a way to stymie the tide of helplessness with a wealth of unprecedented effort.

If putting the country back together after September 11 is a jigsaw puzzle, members of the decorative concrete business are a small but integral piece. Without their efficient efforts, the larger-scale effort would not be same. When Isaac Sparks of Hunt Valley Contractors (HVC) in Owings Mills, Maryland received a phone call on October 2 from Nick MacIntosh, assistant project manager for the sub-contractor working on the rebuilding of the Pentagon, he leapt at the opportunity to help with the project. HVC is a specialty concrete subcontractor and a distributor of form liners. The company provides services for colored, imprinted and textured concrete finishes. It is also the exclusive mid-Atlantic distributor for Custom Rock International form liners.

At just 26-years old, Sparks, an estimator, artisan and part owner of HVC, had wrestled with his own sense of helplessness after 9/11. He even considered military service. To work on the Pentagon would give him and his company a chance to put their hardworking hands into action.

MacIntosh's company, Facchina Construction Co., Inc. had worked with Hunt Valley Contractors on a recent road project. After evaluating the needs of the Pentagon site, he knew to call Hunt Valley Contractors to do the job. The government wanted to recreate the wood textured walls on the interior courtyard walls of rings C, D, and E of the Pentagon and also needed a brick finish that would reach from the foundation to the first floor in the courtyard of ring C.

The government wanted the repair work to exactly match the appearance of the original building. When the Pentagon was built 60 years ago, the walls were formed with 2x4's that left a wood grain on the walls. HVC needed to obtain a form liner that perfectly matched the 7' wood plank pattern and another to replicate the weathered brick. There was of course, a catch. Because the government intends to have the Pentagon reopened by September 11 of this year, the deadline for the project was tight and non-negotiable. The construction at the Pentagon was assigned the second highest priority rating



available in government, the highest being a direct edict from the president. HVC was ordered, in writing, by the Department of Defense to make the project a priority.

Normally, the turnaround time on a form liner is 3-6 weeks; HVC was turning around product in as little as one week. "We were ordered by the government to do this in a timely fashion," says Sparks. "Everything else we were working on was to be put on hold until we completed what we needed to for the Pentagon. They needed everything two days ago." According to Sparks, it was not a difficult sacrifice to make: "My pride as an American wouldn't have pulled me away. You get to a point where you want to do something to help your country and then this job rolled around and this was my way to do something to help."

Difficult deadlines were the most challenging aspect of the project, but there were other unusual circumstances to overcome. "We were starting from scratch, with nothing," says Sparks. "In order to produce anything, I needed time and I wasn't given time." That pressure was passed on to

Custom Rock International in St. Paul, Minnesota and Scott System of Denver, Colorado, the two form liner manufacturers that HVC contacted to produce the form liners. Custom Rock was responsible for the wood grain and Scott System handled the brick.

Custom Rock maintains many standard pattern form liners, but the company takes pride in the quality and volume of custom concrete it creates. "One thing we pride ourselves on is being craftsmen," says Scott Lombard, business manager at Custom Rock. "It's almost an artistic talent. They really needed to put the details into it to get this exactly how they [the government] wanted it."

Normally, Custom Rock allows 6-8 weeks to create a custom form liner. They would receive a sample of a finish, recreate it and send the sample to the client for review. With the Pentagon project, they had to work only from photographs. Using the pictures, the manufacturer was able to create samples, send them to Sparks whom, in turn, showed them to the contractor. Through the contractor, the samples were shown to the Department of Defense and the Historical Society before being approved for production. The approved sample was manufactured into 6,000 square-feet of form liner. The entire process was completed in 16 days.

"In this particular situation, the government wanted it done right away," recalls Lombard. "We were working long hours each day here, literally working Saturdays, Sundays and as many hours in the day we could. When the Department of Defense says 'jump' you kind of go 'okay!'" The project's efficiency is credited to Jim Bohrer, Sales Director for Form liner, and Jim Kluck, Director of Manufacturing. Jim Kluck took responsibility for meeting the project's tough deadline.

Custom Rock has received some local press for its efforts on the Pentagon project and Lombard says it has been a real boost to members of its manufacturing team. "That makes everyone feel really good, to know that they are a part of this. It gives everyone a sense of patriotism that the company you work for helped with the reconstruction after something so tragic. We're very proud of the fact that we were able to participate in this."

Buck Scott, owner of Scott System, has been in the custom liner business for 35 years. But he never thought he would see the day that Isaac Sparks would fax him a letter from the Department of Defense ordering him to assist in the rebuilding of the Pentagon. Scott still has the letter; he keeps it framed on his office wall as a reminder of his team's all-out effort. "I was really proud that we flat-out got it done," he says now. "Guys volunteered to stay late, the truckers all said they were ready to take the load anytime. Everyone just got patriotic and it was fun to do and fun to think that even without that order, we would have thrown our two bits in."

Sparks went to Scott System for a form liner that would replicate, in concrete, a sixty year-old brick wall. Using email to transmit examples of Scott System's standard patterns, HVC selected a rough brick (number #176) standard pattern

form liner. Scott System produced approximately 1,600 square-feet. Their normal production time is 6-8 weeks. This form liner was ready in three full days.

"We have really good people, guys who have been with me for years and I trust them," says Scott. "I just say 'hey men, we have this to do.'" Everyone pitched in with ideas and offered to come in at night. It was a team effort by my company. They were marvelous." Scott also points out that the situation was unusual in that he was working side-by-side with a competitor: Custom Rock International. "When Isaac called and said he needed help and it was on the Pentagon, we put that competitiveness aside," says Scott.

There aren't many photographs of the concrete work this team created — security at the Pentagon does not look kindly on too much photography. The representatives of these companies may never set foot into the courtyard of the Pentagon to see the results of their labors. And when the pentagon reopens for business, it is unlikely that anyone will stop and admire the well-apportioned concrete work. But just knowing they could be a small part of this project is a reward in itself.

"I don't think I'll ever be able to think about this project without thinking about September 11th. None of us here ever want to get a job like this again," says Sparks. "It's great to be part of it, it makes me proud to be a part of it, but when you realize the way the job came about — I hope it never happens again."



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CIRCLE #16 ON READER SERVICE CARD

Round and Round She Goes

A project profile on a radius staircase

By Bart Sacco

Photographs Courtesy Bart Sacco





The photos seen here illustrate a job I did a couple of years back involving a massive radius staircase connected to a 3,000-square-foot veranda which sprawled from a 21,000-square-foot home in northeastern Pennsylvania (see photo 1).

The bluestone-ashlar veranda (see photo 2) features stamped concrete using Brickform TM-100 texture mats from Rafco Products' Creative Images line. The job also included using SS-100 Sierra Seamless texture skins — which allow texture to be imprinted over large areas without bond lines — for the borders and integrating them to wrap in with the steps. The color hardener is CH-825 Slate Green and the release agent is RA-600 Light Gray, both from Rafco Products. The sealer used on this job is Glaze 'N Seals' "Wet Look" lacquer, a crystal-clear, high-solids acrylic coating designed to protect concrete surfaces.

As for the massive stairs, the tread is 18-inches deep and the rise is 4-inches high. The top step is 53 feet in radius and the bottom step is 76 feet in radius. Each individual tread was produced from a continuous pour.

The general contractor had already provided the below grade work and the associated block work (see photo 3) to ensure there would be no movement with the freeze-thaw weather conditions in the region. The staircase started out well below the frost line with solid footings and piers.

A block sub-frame of the steps (see photo 4) was built to a smaller dimension of the shape of the final staircase to allow enough room for an adequate amount of concrete on top and in front of the block work. Then the blocks were filled solid with concrete. This gave us a solid surface to which we could mount our concrete formwork and enabled us to hit our desired grade with accuracy and keep the perfect radius. This method also allowed us to build the final product from the top step down, instead of from the bottom step up. Building from the top down permitted us to produce a very clean-looking vertical riser with a perfect 90-degree angle at the rear of the tread and the bottom of the riser.

The formwork was custom made to suit the job (see photo 4). We used $\frac{3}{8}$ -inch flat stock cut into $2\frac{1}{2}$ - by 18-inch strips for the brackets. The metal was bent on a metal break to leave a 10-inch flange for the bottom and an 8-inch flange for the upright. We offset a #3 rebar and welded it to one side of the bracket for support. (I think the flat stock alone would have been strong enough, but I wanted to make sure there was no deflection once the concrete was placed.)

The rebar was offset on the brackets to allow enough room for our drills to get in, drill the pilot holes and set the masonry fasteners. The face of the formwork was standard grade $\frac{3}{8}$ -inch flat stock metal,





cut 8-inches wide and 20 feet long for the faceplate or the bulkheads. We would have used longer lengths if we could have to minimize our splices, but 20 feet was the longest available.

We vice gripped the 20-foot lengths of the formwork to each other and to the brackets during setup. The concrete was placed at a 2- to 3-inch slump. (I don't like concrete that's lazy or material that promotes bleed water. A higher slump may have been easier to work with but we would have a loss of strength in the concrete and the job

would have suffered in the long run.) The concrete had to be shoveled down the chute of a mixer truck due to the slump at placement. (See photo 5)

When the perfect height and radius was achieved, the brackets were then fastened to the block work below and the faceplate was drilled as needed and bolted to the brackets with ½-inch round-head machine bolts. We added more length to the faceplate with each pour as the step length increased. The machine head bolts were kept finger tight for easy removal once the

concrete was set enough to pull the forms and texture the face.

The concrete thickness over and in front of the block sub-frame is a solid 6- to 10-inch, 4,000-pound mix reinforced with #4 rebar. Each decorative step is drilled and pinned to the preceding step.

We used Poli-Void, a flexible expansion joint material from Stegmeier that is placed prior to pouring the concrete, at the back of each stair tread so we could easily remove the top ¼ inch of foam to make room for the caulking crew to do their job once our work had been completed. The Poli-Void also gave me a good reference point for the placement height of the concrete.

Each step was poured and allowed to set, then it was stripped, finished and saw-cut the same day (see photo 6). Using a step groover, we grooved in control joints at 18- to 20-foot intervals to allow for shrinkage upon drying. This was done in case the set time of the concrete was accelerated due to the

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weather conditions. (It was summertime and the temperature was warm, plus the site was wide open — see photo 7 — and winds could have caused the concrete to dry rapidly.) Every crack-control joint was cut in approximately 10 to 12 hours after placement with a 14-inch high-speed cut-off saw fitted with a diamond blade designed for cutting green concrete.

(Note: We always make a small test slab with each pour to check for timing on the early saw-cuts. If the test slab cuts clean without spalling, there is a

good chance the main piece will cut clean as well. Test slabs also are handy to have if you are trying different sealers or using acid stains to see what your outcome will be before executing the work on the main piece.)

The one dilemma we encountered during construction was when we installed the bottom step and had nothing to mount our form brackets to. We may not have achieved as perfect a radius as with the other steps if we only used pins to hold the formwork. To make our forms fit the work, we simply

poured a temporary footing to attach our brackets to and discarded it after use (see photo 8).



All decorative concrete work in photos seen here was produced by Bart Sacco of Concrete Texturing Tool and Supply, a training center and supply house for decorative concrete tools, supplies and products based in Throop, Pennsylvania. Concrete Texturing Tool and Supply mainly does business via its on-line store at www.concrete-texturing.com.

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SECRETS OF BETTER

To enhance newly-poured concrete or to rejuvenate existing concrete, stenciling is a decorative application worth considering. It may seem like a simple process, but a few fine points separate nice-looking, profitable stencil jobs from the rest. We've asked some experienced stencilers for tips to elevate your stenciling jobs from so-so to spectacular.

Planning the job

First, when you're planning your pours, consider where your crew will walk and stand during the job. If you're doing an indoor floor with walls all around, you'll need to break it up into two pours, first doing a strip all around the edge so that you'll have someplace to stand when you do the center. For an outside patio that abuts a fence or wall, perhaps the client will agree to strategic placement of a flower bed. Or you may be able to erect a scaffold to stand on.

As with all decorative work, you and the client must agree on the final effect. Sample boards let you fine-tune which shades of color hardener to use and show the client exactly how deep the grout joints will be and what the texture will be like, avoiding unpleasant surprises. But, "don't make your mock-ups look better than what you'll be able to do out on the job," warns Frank Piccolo of the stencil manufacturer Art Crete. "When you're doing a little 4-by-4 board, you can always do detail work that's difficult to do when you're out there doing hundreds of thousands of square feet of the stuff."

Stenciling new concrete

Stenciling newly poured concrete takes a little finesse. Once the slab is poured, finish the concrete with a bull float and edge it. Then lay the stencil on the wet concrete, unrolling it from the top of the roll so that it will lie flat.



CONCRETE STENCILING

by Gail Elber

Clark Paepke of DC Concrete in Salt Lake City, Utah, a distributor for Stencil Systems, suggests embedding the first roll of stencil into the surface with a stencil roller, a napped roller about 18 inches wide that fits on a bull-float handle. Apply the roller from the center to the edges to press out any bubbles. Then smooth the surface with a fresno. "You get more control out of the fresno because it's lighter than a bull float." Then lay, roll in and fresno the next course of stencil, placing the trailing grout line of the second course on top of the leading grout line of the first. Trim the stencil with scissors.

Next, broadcast color hardener on the surface. Using more than one color creates a realistic effect. When you're broadcasting powdered material, toss it up so that it rains down onto the concrete. Don't throw it into the surface, which can make the surface

uneven. Bull-float the surface after the color is applied according to the color manufacturer's directions.

At this point, you can apply a liquid or powdered release material in a third color, then texture the surface with a heavy texture roller or a texture mat. Wear texture shoes to walk on the concrete when it's at this stage.

When the concrete no longer yields to the pressure of a thumb, remove the stencil, walking on the concrete in stocking feet or texture shoes. The longer you wait, the crisper the edges of the faux masonry. If you want to remove the stencil earlier, when the concrete is still soft, you should have two people lift it, one on each end, making sure that it doesn't drag on the concrete. No matter when you remove the stencil, before walking on the area from which the stencil has been removed, blow off the surface with a leaf blower so that chips

don't get ground into the surface. Then rinse the area with water.

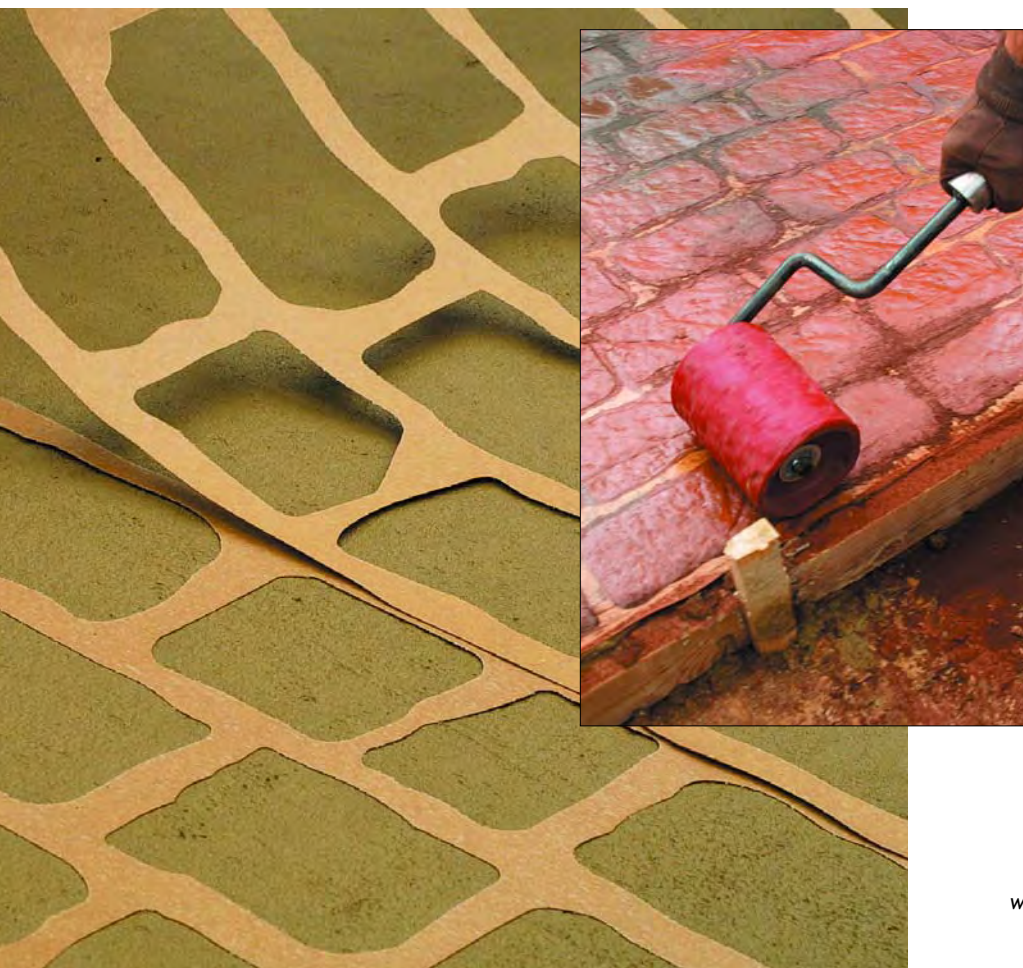
As soon as the surface is clean and dry, apply a cure-seal compound. As with any decorative concrete surface, make sure the client understands the need to apply sealer regularly.

Stenciling an overlay

Stencils aren't only for use on new concrete; they can be used with overlays, which consist of cementitious material mixed with a polymer component so that it spreads thinly and adheres to the underlying concrete. Not all overlays can be colored or stenciled; so, make sure you use a product advertised as a "stampable overlay." These products won't run under your stencil or stick to it prematurely. They can be integrally colored, then treated with acid stain or colored with color hardener or iron oxide pigments to create natural-looking effects.

Overlays can be troweled on, or sprayed on with a hopper or spray texturing system. Benron Equipment and Supply offers the most advanced system currently available for delivering total operator control and flexibility in achieving the most desired textured finishes. If you trowel, use adhesive-backed stencils that won't be dislodged by the trowel.

Prepare the slab according to the overlay manufacturer's directions. In addition to repairing cracks, you must thoroughly wash and degrease it. Some overlay manufacturers offer a primer that improves the adhesion of their product to the slab. When the slab is ready, apply the stencils, and then spray on a 1/8-inch to 1/4-inch layer of overlay material. You can walk in the wet overlay wearing golf spikes, whose marks will be erased when you knock down the overlay with a trowel. Overlays can also be textured with mats or rollers, and then sealed as concrete is.



If you want the grout lines of your faux masonry to be some color other than that of the underlying concrete, you'll have to apply two overlays — one applied over the whole surface to provide the grout color; then another layer over the stencils in the desired color of the stones or tiles.

Walls, also, can be stenciled with an overlay product. Use adhesive stencils, and trowel or spray on your overlay just as on a floor.

Reusable stencils

If you find yourself doing a lot of the same overlay patterns and designs, high density plastic stencils are worth considering. "You get the same results [as with paper stencils]," observes Ken McKinnon, vice president of operations at Seamco Laboratories Inc., the Tampa, Florida-based company that introduced neoprene stencils. "The big advantage is that our stencils are reusable — indefinitely."

Because they are a little thicker than paper stencils, they produce more pronounced grout lines and they lay down flat without glue — eliminating the glue-down step associated with paper stencils. The down-side to plastic stencils, reports McKinnon, is that they are difficult to trowel over. They also have inherent problems if you're working on a vertical surface; they don't stick on their own. But, on the up-side, because there's no glue involved, plastic stencils are easily repositioned on horizontal surfaces and they don't leave a glue residue.

Uneven surfaces shouldn't present a problem since, in most overlay situations, you would apply a scratch coat in the grout color, which will smooth the surface. And don't worry about what happens to plastic when it gets cold — you shouldn't be applying acrylic or cementitious overlays when the temperature falls below 45 to 50 degrees.

Stencils and Acid Etching

A surface-preparation product called The Profiler from Surface Gel Tek can be used to create an etched effect with stencils. In these photos, Dane Hantz of Dane Concrete Design in Prescott, Arizona, demonstrates the technique. The surface was a steel-troweled concrete floor in a home. Hantz wanted to create a 60-linear-foot border around the room.



Hantz masked off the border area and applied a rust-colored acid stain. He then applied a self-adhesive 3-mil vinyl stencil to the floor. Surface Gel Tek or a shop that makes vinyl signs can cut stencils to order from your artwork, but you can cut small ones yourself out of 3-mil vinyl contact paper. The stencil was burnished onto the concrete surface with a plastic trowel.

With an acid-resistant brush, Hantz applied The Profiler to the open part of the stencil. The product is an acid gel that reacts with the cementitious material on the surface. The gel formulation minimizes the fumes generated, making it safe for indoor use with ventilation. It's more pleasant to work with than plain old hydrochloric (muriatic) acid.

In this case, Hantz let the gel work for three minutes, and then scraped it off. Most users let it work for 5-15 minutes. Once the surface has reached the texture of 120-grit sandpaper, the gel has reacted completely with the cementitious material. Leaving it on longer won't create a deeper etch, though it won't do any harm. If you want a deeper etch, you must wash off the exhausted gel and apply a fresh coat.

When etching was done (the gel darkens slightly when the reaction is complete), Hantz



scraped off the gel, diluted it with water, and discharged it to the sewer. He then flushed the cement surface with water, which also could be discharged to the sewer.

Hantz then removed the stencil and let the surface dry thoroughly before sealing it with a solvent-based acrylic sealer.

The Profiler prepares troweled concrete surfaces for painting or other finishing by giving them a slight tooth. The stenciled area can be left uncolored, as in this example, or colored with an

acrylic stain. Acid stain is not necessary, as the necessary acid etch is provided by the gel.



Another plus is that the plastic stencils just peel off and cleaning them is a cinch. McKinnon explains, "After the cement material dries, just hit them together and the cement pops right off."

Stencils and color

In addition to creating faux masonry surfaces, you can use stencils to apply color to concrete and create logos, signs or decorative designs, but forget liquid acid or acrylic stains with stencils because the stain creeps under the edges of the stencil. Adhesive stencils allow you to use brush-on gel-type acid stains. The accompanying photo feature shows another technique: using stencils for gel-type acid etching.

Adhesive stencils intended for sandblasting offer other options, but that subject is worthy of an article in itself, so we won't cover it here.

Stencils vs. stamps

Stencils offer a few advantages over stamps. "With stencils, you can cover

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two-thirds more area in a day with the same crew compared with stamps,” says Piccolo. “You can get on the concrete sooner with your texture and color, right after you bull-float it, where with stamped concrete you’ve got to wait till the concrete gets to a certain set phase before you can get on it with your tools.”

Merrick Pierce of Specialty Concrete Services in Natchitoches, Louisiana, has worked with both stencils and stamps, and says that the choice is a matter of personal preference. “The way I see it, with the stamps, the patterns like slate and the stone patterns look really good, but the brick patterns look better with stencils because they look like they have a real mortar joint.” You can combine stamps and stencils on a job if you need a realistic “stone” patio surrounded by a realistic “tile” border. And if neither you nor your rental shop owns the particular stamp



that a job calls for, stencils can fill the bill.

Perhaps the biggest advantage of stencils over stamps is that you can order custom stencils. Stencil manufacturers will cut custom stencils for you to create a particular pattern, logo or artwork.

Neither method offers a big price advantage over the other.

In a given region, stenciling and stamping cost the client about the same.

If stenciling interests you, attend one of the workshops offered by the makers and distributors of stencils and overlay compounds. Look for training opportunities by visiting *Concrete Decor's* Web site (www.concretedecor.net/cd_events.html) and checking the “Calendar of Events.” With training and some practice on your own, you’ll soon be ready to add this versatile technique to your repertoire.



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CIRCLE #72 ON READER SERVICE CARD

(Continued from page 29)

Polystone Products of St. Paul, Minnesota, may have just the thing you're seeking. About a year ago, the company nationally debuted its Versaliner, a polyurethane step form liner that can help create steps that look more like stone than concrete.

The reusable, finish-free, step-form system is designed to imprint a slate texture onto concrete stair risers and caps. (You'd still have to use a mat for the treads.) The product comes in 12-foot lengths with 2- and 3-inch cap pieces and separate riser pieces that range from 3 to 4½ inches in ½-inch increments.

"The benefits are many," says Bryan Greger, president of Polystone Products. "The system is tremendously faster and you get much better results. With this form liner, you'll create steps that look they were made by a stonemason."

Basically, a contractor attaches the liner to the formwork with brads and when the concrete's set up, he strips it away. "You can use the liner again and again," Greger says. "Maybe 100 times or more. It lasts as long as stamping mats do."

As for radius work, "You can do a radius with no problem because you don't have to cut into the corners," he points out. "You just wrap the liner around them."

Due to many requests at the World of Concrete, Greger says his company plans on introducing a one-piece system in varying sizes that will simulate both granite and slate textures by this summer.



For more information on any of the products featured in this article, please contact:

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Long-Range Planning:

If there's one skill that most people wish they had, no doubt it would be the ability to know what's going to happen next week... or next year... or in 10 years... or in 30 years. It sure would make contractors' lives easier if they could know what the weather would be like tomorrow, or whether business will be brisk enough in the coming months to recoup the cost of major equipment purchases, or whether the economy is going to head south next year, or what a cozy retirement will cost two decades from now. As long as this ability eludes us, however, we all must rely on educated guesses and sober analysis of available data and various indicators to plan as best we can for the short-term and long-term future. It's a daunting task we all face, in our professional and personal lives alike.

The key to running a successful business is to set realistic goals, develop a plan to achieve those goals, and implement the plan in a logical manner. According to Mark Bowman, a business professor at Emory University, "Every business plan needs to address three questions: Where am I now? Where do I want to go? How am I going to get there? In other words, assess your current business situation, identify where you want your business to be at some pre-determined point in the future, and spell out the strategies and tactics you should pursue to get there."

Regardless of whether you're a painting contractor, a caterer, an architect or a photographer, if you're running your own business, you need a

plan that addresses both short-term and long-term concerns. As author Mark Hendricks puts it in his book, *Business Plans Made Easy*, "About the only person who doesn't need a business plan is one who's not going into business. Anybody beginning or extending a business that will consume significant resources of money, energy or time, and that is expected to return a profit, should take the time to draft some kind of plan."

Most of us live our lives by regularly setting and meeting short-term goals. Every time we draw up a "things to do" list and proceed to accomplish the tasks listed, we're pursuing a goal-oriented strategy, and that's a time-honored, proven way to be productive and stay focused on what needs to be done.

Long-term planning, though, is much more challenging, simply because of the many variables and factors that come into play as time passes and changes occur. Most experts consider long-term planning to be anything beyond five years, although some say anything more than two years is pure guesswork and should be regarded as long term. For example, who knew in 1999 that, two years later, the euphoric economic peaks would transform into gloomy valleys, made worse by catastrophic events that took everyone by surprise? It's difficult enough figuring out where you want to be a year from now; determining where you want to be in five or 10 or 25 years may seem almost impossible. But it must be done, even if only so you won't be spending your declining years eating meat loaf six nights a week.

Planning for retirement

"For the average self-employed contractor, when we talk about long-range goals, we're basically talking about retirement," says Lynn Fife of Evergreen Technologies, a renowned expert in the contractor industry and author of several business-related books geared to contractors. "If your primary long-range goal is to have enough money in X number of years so you can enjoy a comfortable retirement, then everything in the long-range plan you develop must point toward realizing that goal."

The first step, then, is to determine the kind of retirement you want and when you want it to begin. Fife notes, "Do you have dreams of retiring at age 45 and traveling the world? That's going to require quite a bit of money. Or are your hopes more along the lines of building a simple cabin in the woods and enjoying the solitude? Your financial needs will be significantly less in that scenario. Either way, you'll need to do research to find out how much money you're going to have to depend on as income to support the way you want to retire."

In creating your plan, writes Hendricks, you must look at all the things a company's profit structure should have. You need to know your overhead costs versus your anticipated revenues on both a monthly and annual basis, and you need to regularly compare these two areas to ensure that revenues exceed expenses. The amount that remains, of course, is your profit, and if you find that it's insufficient to allow you to build the future you're shooting for, then it's time to amend your plan.

A Challenging but Essential Task

By Bruce Hackett



A crucial component of long-range planning is monitoring your profit margins and keeping a watchful eye on industry trends and economic signs, and then amending your plan as necessary to react when things aren't turning out as predicted. As the old business maxim goes, "Plan your work, and then work your plan, and then rework your plan." If your margins are shrinking, or a competitor is eroding your market share, the time to take action is now. Increasing the frequency or breadth of your advertising efforts might be a solution; downsizing your staff might be another; raising your prices might be a third option. But doing nothing and hoping things will turn around on their own will almost certainly spell failure.

Maintain your message

When a recession hits, some businesses, ironically, do precisely the wrong thing by cutting advertising. They erroneously view advertising as an expense instead of as an investment. According to *Advertising in a Recession*, produced by the American Business Press (ABP), "When the economy slows down, it's time to make sure you maintain and even increase your advertising. Studies have shown that companies that continue to market themselves during a recession will solidify their customer base, take business away from more timid competitors, and position themselves for future growth during the recovery."

The message you choose to convey to prospective customers can have a dramatic effect on your ability to win

business in a down economy, the ABP maintains. "In a recession, people are eager to minimize risk when they buy. Emphasize in your advertising, brochures and flyers those factors that show how dealing with your company minimizes risk. If you have a track record of quality and reliability, and you offer warranties or guarantees, promote those prominently."

Fife wholeheartedly agrees. "Contractors should advertise constantly, because as soon as you stop, you're going to slow down the influx of qualified leads you need to keep your business going. If your response to economic uncertainty — spurred on by war, or terrorism, or whatever the case may be — is paralysis, then you're letting panic put you out of business."

McKinsey & Co. strategist Hugh Courtney told *Business Week* recently, "I'm really worried about people looking at the uncertainty following Sept. 11 and having it be overwhelming. It's natural that people adopted a wait-and-see attitude immediately following the attacks, but that can be a trap. A lot of the factors that matter most to a business — position in the market, what the competition is doing, the value proposition of the product or service — haven't changed much. We need to focus on those areas."

React to customer base

In good or bad economic times, Fife adds, keeping an eye on your customers should always be a top priority. "Among the high-end residential, a down economy usually doesn't affect their spending

habits much. Middle-class residential customers, however, typically regard painting as a want rather than a need, so in a down economy, they may conclude they shouldn't spend money on that right now. If they're a big part of your business, you should look toward diversifying, or shifting to other markets. Explore some of the niche markets that are emerging, like concrete acid staining, or faux finishing."

New construction is different, he notes. "Even during a downturn, construction goes on, and builders need to have painting done. If you're not doing much work with general contractors, you should consider it. Some painters give in to fear and lower their prices in order to win contracts, but all you really ought to do is provide the same high-quality service at the same fair price you always do, and be aggressive in your pursuit of the business."

Experts concur that, regardless of the current or future economic picture, the key to survival is your business plan, and your adherence to it. Presumably, your plan is designed to make you profitable enough to permit the type of retirement you seek. When the economy temporarily hits a rough patch, you may need to tinker with certain details, but overall, stick to the plan you devised in good times to guide you through the not-so-good times.

Fife's advice is straightforward. "Think positively, continue getting your message out, keep doing the things you usually do, pursue new business vigorously, and stick with your plan, working to improve those areas that affect profitability."



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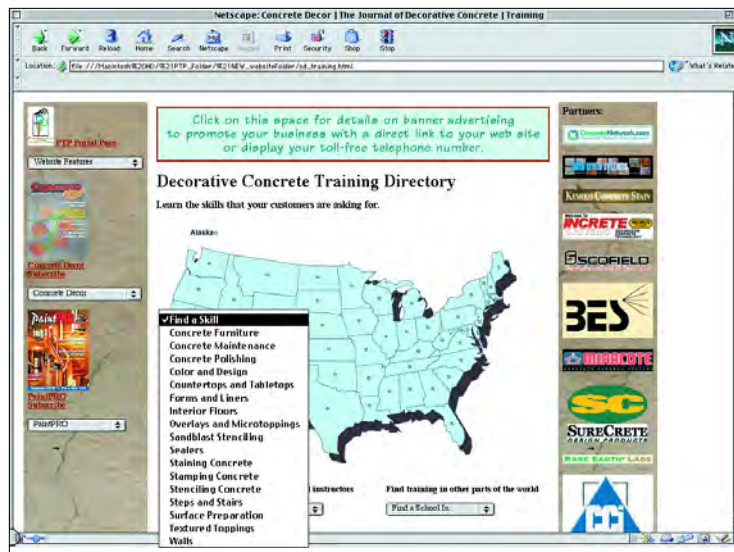
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or pushed to clean within 1½ inches of the front wall. The 1-8DEC is available in 110- or 230-volt models. Contact Blastrac, a division of USF Surface Preparation Group, on the Web at www.surfacepreparation.com or send and e-mail to info@usfspg.com.

Concrete hand tools have improved handles

Stanley has expanded and redesigned its Goldblatt line of concrete hand tools. The company's magnesium floats, finishing trowels, edgers, and groovers have been redesigned for improved cleanability and function. New magnesium floats include a bevel-end cast magnesium float, an extruded magnesium float, and a round-end extruded magnesium float. The new floats feature a three-position handle which gives the user a variety of positions to grip the tool, allowing for expended reach and the use of two hands. The handle height has been lowered to give the tool a lower center of gravity and improved user control. The durable one-piece composite handle design has a rubber overmolded slip-resistant grip. The one-piece handle does not have a screw, so it is easier to clean and does not need tightening. The Stanley Goldblatt line of finishing



trowels now have a new, solid, one-piece composite handle that has a rubber overmolded grip. The trowels' new tang design increases handle strength to 300 pounds and improves the life of the tool. The blade is now attached with electrically fused rust-resistant studs to give the blade improved strength.

New edgers and groovers also have one-piece, slip-resistant handles. The handle-to-blade attachment has been improved to increase the life of the tool around the jobsite. The no-screw handle never needs tightening and is easier to clean. Some models are available with a heavy-duty bronze blade to provide extra durability and crisp, sharp edges. Contact Stanley at 1-800-STANLEY or at www.stanleyworks.com

Plastic forms have steel stake pockets

New "Poly Meta Forms" from Metal Forms Corp. consist of plastic forms with steel stake pockets that can be used to place all types of concrete flatwork as well as curb and gutter. Excellent for straight and radius forms.



The forms are designed to be lightweight, moisture resistant, durable, and easy to maintain. For more information please call (414) 964-4550 or visit us online at www.metalforms.com

Vapor reduction system protects tile adhesives

The MoistureBloc Vapor Reduction System from Vexcon consists of a primer and top coat that can be applied on concrete floors or slabs on grade to block the transmission of water vapor, which may damage tile adhesives and cause other problems. Each coat dries overnight. The system is designed to withstand 576 psi (4 Mpa) of hydrostatic water pressure, and costs the contractor approximately 30 cents per square foot. Contact Vexcon directly at (888) 839-2661 or www.vexcon.com.

Mending compound is fast and food-safe

Roadware's 10 Minute Concrete Mender is a thin compound formulated to penetrate any moisture, frost, surface grime, or dust to establish a permanent interface



with the base concrete. The patched area is ready for traffic in 10 minutes. Developed by NATO for the rapid repair of bomb-damaged runways, Concrete Mender can be used to penetrate hairline cracks or may be extended 3:1 with manufactured sand. It is USDA approved for use around foodstuffs. Call Roadware, Inc. direct at (800) 522-7623.

Takeoff software saves data in Excel

Vertigraph has developed BidPointXL, a Microsoft Excel add-in tool that lets the user click on an Excel spreadsheet, then fill it with information electronically measured and drawn from paper plans using a digitizer tablet. Users can take off circles, arcs, and rectangles by clicking on three points instead of tracing. The software contains a collection of Excel estimating templates for general contracting, concrete, and other trades. Contact Vertigraph at (800) 989-4243, fax (214) 340-9437, e-mail info@vertigraph.com, or visit their Web page at www.vertigraph.com.

PCA launches education foundation

The Portland Cement Association has established a new foundation to help finance education programs in nearly every facet of the cement industries, from university research fellowships to career recruitment and craft training. The foundation's initial annual budget will be \$285,000, which will be used to provide direct educational grants for student scholarships, fellowships, and university professorships with a focus on increasing the use of cement and concrete; sponsor educators and students attending cement- and concrete- related workshops and seminars; and develop educational courses, programs, materials, internships, and international exchanges. For more information, contact James F. Rappel at jrappel@portcement.org or Richard P. Bohan at rbohan@portcement.org.

Mapei introduces thinset topping and flow test kit

Mapei has introduced Ultratop, a self-leveling, abrasion-resistant cementitious topping that can reach compressive strengths of 6,100 psi (42 Mpa). The material is supplied white or gray, and the white material can be integrally colored or topically stained. In addition, Mapei has introduced a Field Flow Test Kit to solve problems related to over- and under-watering of the company's Ultraplan series, Novoplan series, and Mapei Ultratop. The applicator mixes the product, then applies a measured amount to a test sheet marked with boundaries. If the material flows outside the boundaries, there is too much water. If it doesn't reach the minimum level, there is not enough water. Job conditions vary from job to job and we are confident that this simple test kit will make your job easier. The test sheet included provides a place to record information regarding the project. For more information, call the company at (800) 42-MAPEI or visit us on the web at www.mapei.com. For complete

product information faxed to you 24 hours a day, call the MAPEI InfoFax System at 1-800-617-5481.

Hitachi introduces the first portable rebar cutter and bender in the industry, the VB16Y

Hitachi Power Tools has introduced its revolutionary VB16Y. This new rebar cutter/bender provides jobsite cutting and bending of rebar in one portable and completely unique tool. Precision angle bends are preset and completed in just seconds. Utilizing an impressive 530 watts of power, the VB16Y's built-in microprocessor uniformly bends up to No.5 Grade 60 rebar at a maximum angle of 180 degrees. The operator has complete control over the velocity and angle at which the rebar is bent. A variable speed trigger with safety lock provides the operator with "manual-like" precision and control over the bending speed. Reference markings on the bending plate provide for easy position adjustment. And with



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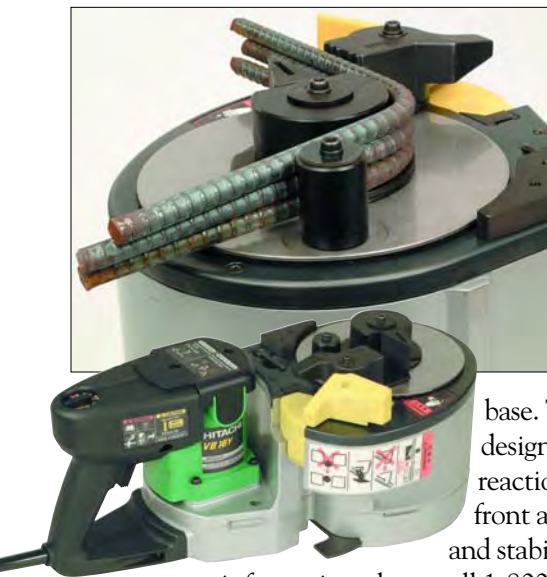


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the turn of a pre-set dial, you can make cuts at a numerous variety of angles with no problem at all. The VB16Y weighs 42 lbs, is easily transported to the jobsite or bolted to a fixed

base. The low profile design combined with two reaction receivers at the front and the rear, balance and stabilize the tool. For

more information please call 1-800-546-1666 or visit us on the web at www.hitachi.com/powertools

Dust Muzzle from Shave Away

Shave Away, Europe, the manufacturer of the Dust Muzzle is manufacturing and selling a new dust collector designed for circular saws, the Saw Muzzle. The Saw Muzzle is made of



heavy duty, fiber filled ABS plastic and is designed to fit the Skil, DeWalt, Milwaukee, Makita and Bosch industrial worm drive circular saws. It is lightweight, easy to install, unobtrusive and will collect over 95% of the dust created when used with a standard industrial shop vacuum.

\$59.95. Dealer inquiries invited. For more information call Shave Away, Europe at (619) 223-2154 or visit them on the web at www.dustmuzzle.com

Polyurethane 250 from Arizona Polymer Flooring

Arizona Polymer Flooring has developed a unique clear sealer for architectural concrete. Polyurethane 250 is a two component, solvent based aliphatic urethane. It is completely non-yellowing in exterior applications and achieves extraordinary adhesion to a wide variety of surfaces including solvent sealers and polyester urethanes. Elcometer pull test readings of up to 800 psi have been attained over lightly profiled concrete.

Polyurethane 250 can be applied to damp surfaces, intensifies color and is ideal for use over acid stains.

Compared to solvent acrylic sealers, this product offers significant improvements in the following areas:

1. Gloss and gloss retention.
2. Resistance to foot and traffic abrasion.
3. Resistance to tire tracking.
4. Soil release and stain resistance.
5. Tolerance to substrate moisture.



Polyurethane 250 is available in high gloss or satin. Call 1-800-562-4921 for complete data sheet or a free sample.

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