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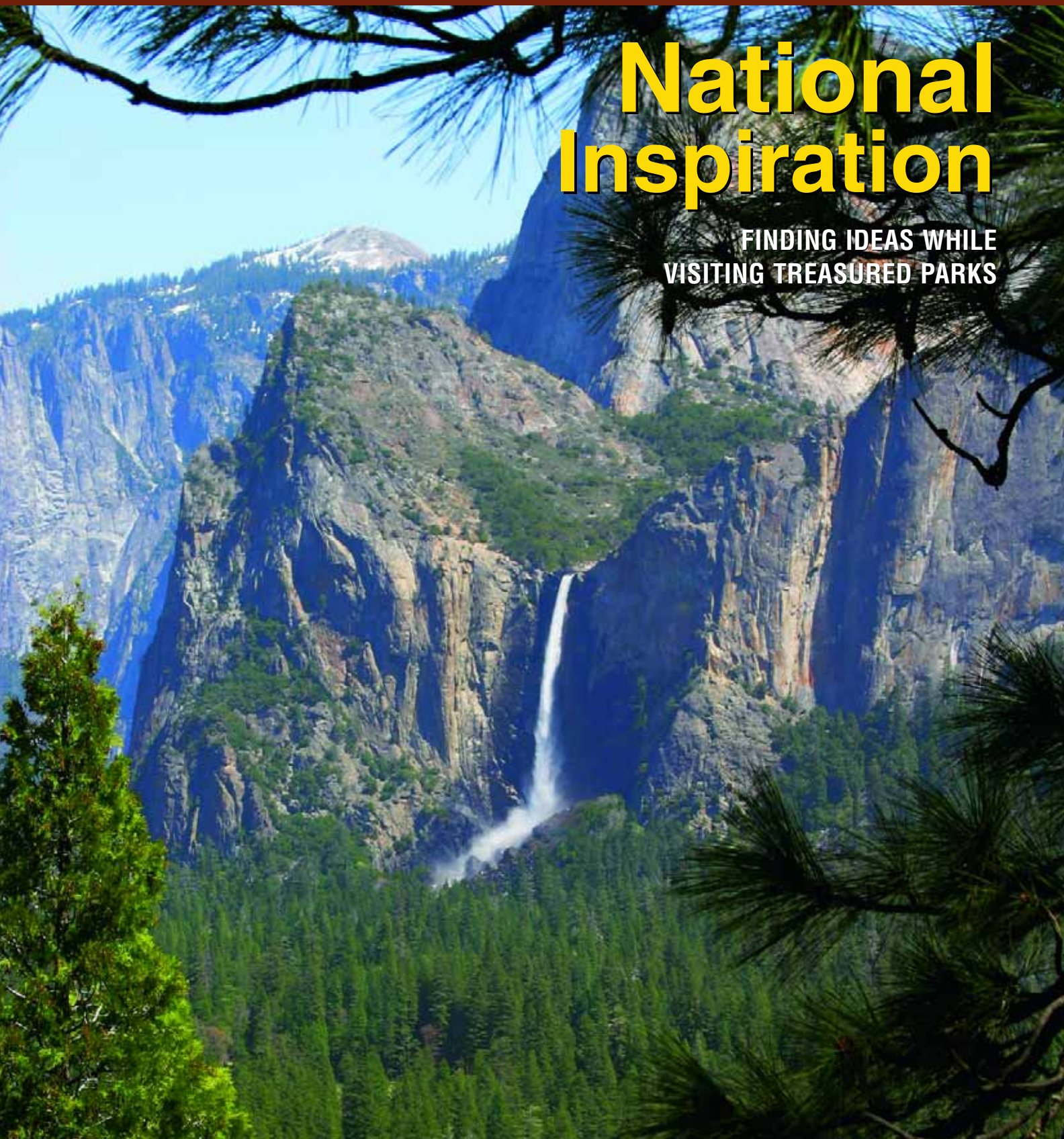

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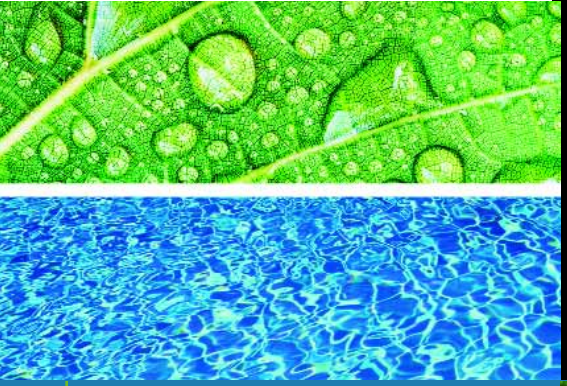

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On the Cover: Photo by Jim McCloskey

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Extreme Treatments

By Eric Herman

Through the years, *WaterShapes* has published numerous columns and articles that speak to the value of studying and appreciating nature. Time and again, for example, contributors ranging from Brian Van Bower to Anthony Archer Wills (along with others too numerous to list) have waxed eloquent about the importance of getting out and taking good, long looks at the way things get done in the natural world.

Those of you who have not been inclined to take that message seriously will get quite a break on September 27, when the Public Broadcasting System will begin airing "The National Parks: America's Best Idea," a six-part series by renowned documentarian Ken Burns. I think every watershaper should give it a look – especially those of you who haven't yet taken the time to explore these treasured resources on your own.

Burns has offered some amazing historical portraits in the past, including "The Civil War," "Jazz," "The West" and "Baseball," and his ability to tell complex, sweeping stories is probably unmatched among today's filmmakers. I for one can't wait to see what he manages to do with our national parks.

▼▼▼

It's entirely coincidental, but in this issue we offer our own mini-documentary on a select group of national parks in the form of "Natural Wonders" by watershape and landscape artist Rick Driemeyer (page 56). This beautifully illustrated piece – part travelogue, part meditation – covers his experiences in Yosemite, Zion, Bryce Canyon and the Grand Canyon, all of which have, in very different ways, been shaped primarily by water and have been encouraging and inspiring him since long before he started his career.

After working with Driemeyer in preparing his article – and anticipating that Ken Burns' documentary will be another in his growing line of masterpieces – I can honestly say that a trip to Yosemite, the Grand Canyon or even the much-closer Los Padres National Forest will be in my plans for the coming year. And my guess is that, all things considered, the same might be true for you, too.

▼▼▼

For several years now, I've witnessed all sorts of discussions (some of them heated) about whether pneumatically applied concrete (either shotcrete or gunite) produces permeable or impermeable structures, the subtext always being questions about the adequacy of the pool industry's standards for compressive strength. In those exchanges, the name of concrete expert George Yoggy kept cropping up, so I contacted him and was pleased to hear that he was more than willing to help clear the air.

In "The Elevated Game" (page 44), he approaches concrete science from the perspective of one who builds tunnels, dams and mines, so he treats the material and the subject with gravity and rare practical insight. For watershapers who routinely use pneumatically placed concrete in far less critical applications, my hunch is that Yoggy's piece will be enlightening and influential and perhaps even invaluable.

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In This Issue

September's Writers

Ben Dozier is partner and principal of design at Root Design Co., a landscape architecture, pool construction and estate management firm located in Austin, Texas. The firm focuses primarily on private commissions related to residential estates, with an emphasis on unique gardens and watershapes. A graduate of Western State College in Gunnison, Colo., with a degree in recreation business, Dozier has extended his studies in the industry through the Mike Lin Graphic Workshop and continuing education courses sanctioned by the American Society of Landscape Architects (ASLA), the Association of Pool & Spa Professionals and Genesis 3. He currently serves as chair of ASLA's Design/Build Professional Practice Network.

Michael Percy, ASLA, is senior landscape architect at Root Design Co. A graduate of Louisiana State University, he has been certified by the Council of Landscape Architectural Registration Boards (CLARB) and the Texas Recreation & Park Society. Before assuming his current position, he held positions at Jeffrey Carbo Studio, Mesa Design Group and HNTB Corp., refining skills in design and management of high-profile public projects that he is now applying in residential contexts.

George Yoggy has been involved in concrete application for the construction and repair of critical structures for nearly 50 years. From 1967 to 1986, he owned and operated Concrete Equipment Corp. and Shotcrete Plus, both of which were engaged in the design, manufacture and supply of equipment used in shotcreting and concrete placement in North America's tunnel and mining industries. In 1986, the company was acquired by Master Builders, Inc., for which Yoggy established the Underground Construction Group of MBT

Americas. He currently serves on various committees, including American Concrete Institute Committee 506 (Shotcrete), and is a member of the board of directors of the American Shotcrete Association and president of the American Underground Construction Association. He is also an active participant and respected leader spearheading a number of concrete industry initiatives.

Jim Wilder is founder and owner of Living Water Creations, a Santa Rosa, Calif., design and construction firm focused on custom waterfeatures for both residential and commercial clients. He is also founder and owner of Pond & Fountain Pros, a pond and fountain supply firm also based in Santa Rosa. A 1975 graduate with a degree in geophysics from Sonoma State University (Rohnert Park, Calif.), Wilder began his working life in engineering and geophysics before shifting to watershaping on a full-time basis 22 years ago. In his spare time, he is an accomplished three-cushion billiards player.

Rick Driemeyer is founder and president of Both Sides of the Door, a watershape and landscape design/build firm based in Oakland, Calif. His design career began in Ann Arbor, Mich., in the early 1970s, when he became a specialist in interior landscapes and watershapes. After moving to California and expanding his work to include exteriors, he established his current company in 1981, deriving its unusual name from the fact that he now works with both interior and exterior spaces. An Arizona native, Driemeyer traveled extensively as a child with his family and has lived in Florida and Pennsylvania as well as Michigan. He credits this exposure to different types of landscapes and his parents' love of the arts and nature as primary design influences.

There's absolutely nothing wrong with acknowledging that other people bring different skills to the collaborative process: We should recognize the benefits of tapping into their acumen.

Setting Egos Aside

By Brian Van Bower

One of the themes I've covered repeatedly through the years has had to do with the need for all of us to become effective team players. True, there have been times when egos have gotten in the way and I've found myself in fairly dysfunctional groups, but for all that, I have to say that collaboration very often yields great results.

In fact, the vast majority of team projects in which I get involved these days are wonderful collaborations among clients, architects and general contractors as well as (depending on the project) interior designers, landscape architects, lighting designers and more. Of all those practitioners, landscape architects are typically those with whom I work most closely as a watershape designer, but I also exchange ideas with everyone else on these teams as well.

These days, we're most often brought in by either the architect or, more often, the landscape architect – and we're very fortunate that, in a number of cases, the landscape architects we work with get us involved in all of their projects that feature water. That's great for us because it lets us focus on designing rather than marketing – and even better because some of the projects we're called in on are truly awesome.

when it works

As I've indicated, most of the time these collaborations yield terrific results. Recently, for example, we designed a set of watershapes for Pond Bay, a resort in the Bahamas – and actually ended up designing the project *twice*.

The first time around, we designed a pool area on the water. It was quite nice, we were paid for our work and everyone was happily awaiting construction. But before anything happened on site, the owners brought in a management firm and, somewhere along the line, we learned that the exterior areas were to be completely redesigned and that the architect wanted us to tackle the revisions.

This time around, there were many more players, including a landscape architect, an interior designer, an irrigation specialist and a firm that was to develop the outdoor sound system. Indeed, there were 18 or so of us around the table, and all sorts of ideas flowed back and forth. (Before the session ended, by the way, the landscape architect pulled me aside and mentioned how much he enjoys my columns in *WaterShapes* – as I see it, a wonderful foundation for a great collaboration!)

The new design includes a beautiful bar area accessed by a bridge crossing over a large pond at the access point to the outdoor area. There's also an indoor/outdoor restaurant adjacent to another decorative waterfeature as well as a raised perimeter-overflow pool that appears to flow into a lower pool set right on the ocean.

Everyone was involved, everything was positive and ideas aimed at making the project better flowed constantly. At no point during our initial meeting or during the ensuing process (which involved a considerable number of e-mails) was there ever a hint of ego. And that was great, because we were all under tremendous pressure to deliver our plans within 30 days: Everyone just pulled together and the process clicked.

I came away from that experience thinking that I would more than welcome the opportunity to work with *any* of these profes-

sionals again in the future, and I'm reasonably confident that it will happen at some point, basically because we developed the sort of practical, professional camaraderie you don't soon forget.

Things don't always work out so positively, of course, which is why at this writing I'm living through the hell of being part of a team that lacks any sense of cohesion or common purpose. It's a nightmare, pure and simple: The clients are members of a well-known family, and they brought me into the project directly, adding me to a team that already included a general contractor, an architect and a landscape architecture firm, of which only the general contractor was familiar to me.

I won't name names here, as it's not my intention to tarnish anyone's reputation, but I must reserve the privilege of saying that the landscape architects in this case have been particularly (and almost incredibly) difficult. It was clear from the start that they resented my participation and didn't see any need for me to be there at all. Right away, in fact, I received a call warning me not to change *anything* they proposed and indicating in very clear terms that they would only be satisfied if I made no suggestions of any kind.

forging ahead

My staff and I work with swimming pools every day, and the homeowner had paid me good money to offer ideas that I thought would improve the project. It made no sense to me on any level that the landscape architects would categorically refuse to listen to (let alone consider) my suggestions. After all, what harm is there in entertaining different ideas?

But they stuck to their guns from wall to wall, and I have to say that the resulting design is nothing I'd ever want to see covered in *WaterShapes*. They were rude, which I guess I can handle, but I also see this as a complete injustice to the client.

To give just one example of what I mean, the landscape architects insisted on outfitting the pool with commercial-style tile gutters – a key, they said, to the sort of "retro" look they were after. I didn't want to be stubborn, but I saw a good reason why this is a retro (that is, no longer commonly used) look: It wasn't all that great an approach back in the day, and as an industry we've found *much* better alternatives in the years since gutters were commonly used!

The landscape architects also thought that the gutters would provide good handholds for children – which is true, but we could easily have accommodated that concern with any of a number of more aesthetically pleasing coping treatments. It was, in short, a dumb design detail that I would never use, given a choice. But I had none, so now the system meets all of the hydraulic requirements of (and expense related to) a full perimeter-overflow system with absolutely none of the good looks.

Continued on page 14

What's worse is that the entire process has been a small war, with every aspect of the design becoming a silly point of contention. As I see it, it was all because the landscape architects couldn't control their collective egos to the point where they would accept input, even from someone the client himself brought in to gain the advantage of a watershape specialist's perspective.

And it's not just landscape architects – not by a long shot. In fact, I've seen situations where the swimming pool contractors are the ones acting like prima donnas.

As my Genesis 3 colleague David Tisherman often points out, there are many pool builders who scoff at the "artiness" of the design process: They are so concerned about the technical side and construction details that they recoil at the mention of color theory, art history or creative materials selection. To a large extent, overcoming that tendency within the pool industry is exactly why Genesis 3 exists – and why this magazine has always been so important.

I am amazed and disappointed that, at this late date, there are still pool contractors who are stuck in the past, offering cookie cutter designs that provide clients with precious little by way of aesthetic value. The only explanation I can see is that these individuals can't suppress their egos to the point where they can accept the need to learn a new trick or two.

My additional guess is that current economic conditions will drive many of these folks out of the marketplace, but I doubt we'll ever truly be rid of that type of limited thinking.

another direction

The plain fact is people on the swimming pool end of the watershaping industry stand to gain a great deal from collaborating with and paying attention to the work done by landscape architects, many of whom are truly accomplished artists.

I know I've learned a great deal from landscape architects such as Raymond Jungles, who does a lot of work in south Florida and the Caribbean and with whom I've crossed paths on a number of projects. Not only is he wildly creative and extremely knowledgeable, but he is also tremendously open to input from others.

When any watershaper has the chance to team up with designers of such high caliber, we should always view these situations as golden opportunities to develop our own design skills. After all, landscape architects have been schooled in design principles and practices and quite often approach the watershaping process with different and (often) more educated points of view than the typical pool designer or contractor.

As I see it, there's absolutely nothing wrong with acknowledging that other people bring different skills and experience to the process: Just as many landscape architects do well by accepting input from smart swimming pool designers and contractors, we too should recognize the benefits of tapping into their acumen when such opportunities arise.

To show how well this can work, I'm currently working on a project that will be built on a small semi-private island in the Bahamas. In this case, the initial discussions on collaboration have been seamless and are a perfect example of how various areas of expertise can mesh.

In this case, before I was brought in, the architect had designed a beautiful vanishing-edge pool with radii on each end where he located shallow lounging areas. In my discussions with the client, I suggested that the vanishing edge should extend all the way around the two ends and that the depth of the lounging areas should be set at six inches instead of a foot.

By then I was on a roll and also expressed the thought that a planter would be a nice transitional feature outside the catch basin: This way, the basin could be raised from about seven feet below the edge to about 30 inches – a safety measure that would, I opined, eliminate a risk of falling and also create a smoother visual transition when the pool was observed from below.

Then I suggested that the other edges should become a deck-level perimeter overflow feature, topping it all off with the thought that, given the fact that water is an extremely precious commodity

for the island's residents, it would be a good idea to establish the entire deck as a water-harvesting area – and that all it would really entail was increasing the surge tank's capacity so it could store rainwater that could then be used for the pool.

Those were some fairly significant changes, and I asked the homeowner if the architect might be bruised by such a pile of ideas. He assured me that, although the gentleman had an ego, he'd also known him to be highly susceptible to the charms of ideas that would make the project better.

a fine example

By coincidence, I spoke with the architect just before sitting down to compose this column and used the opportunity to go over all of my suggestions with him. I started by explaining that my goal in all projects is to work with everyone involved to make the design as good as it possibly can be in both functional and aesthetic terms. He immediately indicated that he was also an advocate of team efforts and would be happy to run through my ideas, no problem.

Although we're still in the midst of developing and refining the design, I'm confident that many of the features I've suggested will be included – and that, when it's completed, this will almost certainly be a project I'll proudly add to my portfolio and about which I will likely submit a feature article to *WaterShapes*. And when the time comes, you may rest assured I will be certain to credit the architect for his contributions.

The upshot is that everyone involved in projects such as these (and especially the homeowners) will benefit from thinking that's open-minded and unaffected by ego. I'm not saying ego is a bad thing – it's what keeps lots of designers going through thick and thin – but that it can become a problem if it gets in the way of a project's optimal outcome.

Custom watershapes can be costly and often become major components of our clients' homes and lifestyles. We need egos to have the self-confidence and self-assuredness required to make important design decisions, but we also need to be secure enough in our skills and humble enough in our mindsets to be receptive to input from others on design teams who have what it takes to help refine and polish ideas to a perfect luster.

When people who respect each other come together and get to work, then we all have the opportunity to create projects that are as good as they possibly can be. WS

Brian Van Bower runs Aquatic Consultants, a design firm based in Miami, Fla., and is a co-founder of the Genesis 3 Design Group; dedicated to top-of-the-line performance in aquatic design and construction, this organization conducts schools for like-minded pool designers and builders. He can be reached at bvanbower@aol.com.

On the Level

Most (if not all) landscape architecture programs at major universities place little emphasis (or none at all) on providing or encouraging students to obtain field experience.

Learning by Doing

By Bruce Zaretsky

In my capacity as landscape consultant to a town near where I live, I was approached recently by a landscape architect who was just starting her career after graduating from a prestigious, five-year landscape architecture program in my home state of New York.

She was designing a butterfly garden, she said, and wanted to know what plants to use. As I ran down the list, she asked me to stop at one name in particular and spell it. The plant in question was *Clethra alnifolia*, commonly known as "Summersweet" – a New York native widely known for attracting butterflies and hummingbirds.

I bring this up because, frankly, I was flabbergasted that after five years of education, this newly minted landscape architect seemed to have no knowledge of local fauna. I'm the first to acknowledge that there are far too many plants out there for any of us to know all of them, but I was left to wonder if they'd taught her *anything at all* about plants as part of her studies.

This wasn't the first time I'd had such an experience. In fact, I've been taken aback by the lack of practical knowledge landscape architects bring to the process more times than I care to consider – and can't say I'm surprised that it's especially a problem among those just coming out of school.

point of consensus

The episode with the butterfly garden brought back to mind a dialogue started several years back by Bill Thompson, editor of *Landscape Architecture* (the official publication of the American Society of Landscape Architects): In his column, he'd asked if students of landscape architecture should be trained in the field as well as in the classroom.

I responded with a long letter in which I asserted that, *absolutely*, all landscape architecture students should be required to spend time in the field learning about the ramifications of their design work. They should know, I wrote, exactly what it's like to dig holes, set bricks, prepare soils for planting, shoot grades, install drainage systems and witness the effects of their hydraulic designs – among myriad other experiences.

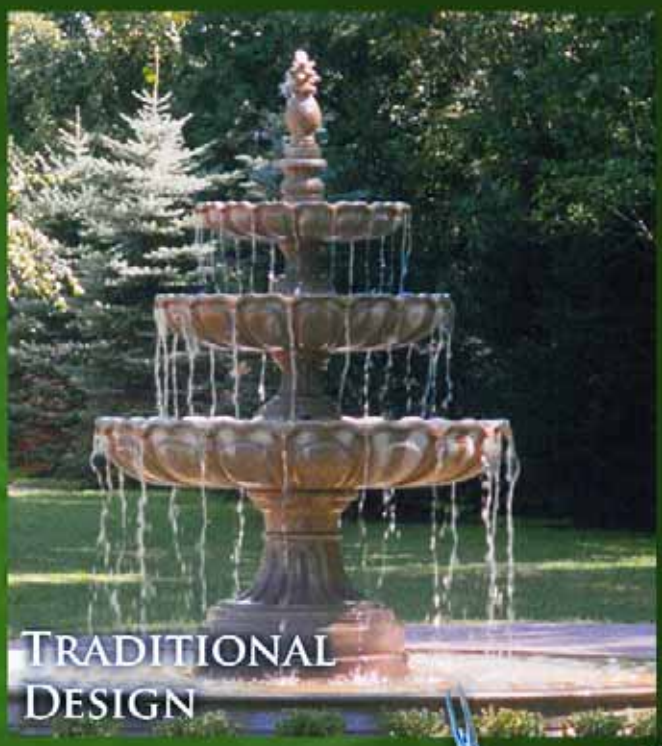
It was strongly put, and I fully expected some blowback from landscape architects – but was delighted instead when every other letter the magazine published fell in with my line of thinking. Here were schooled, experienced landscape architects saying they would have benefited greatly from in-the-field training!

What I learned through this exchange is that most (if not all) landscape architecture programs at major universities place little emphasis (or none at all) on providing or encouraging students to obtain field experience. I see this as a major deficiency in the training of these young professionals.

In the interest of full disclosure, I am not a landscape architect. Some 30 years ago, after just finishing my first year of college in pursuit of a career in chemistry, I stopped in at a Long Island landscape company's office and asked for a job. That same day, I was driven out to a hot, dusty construction site and was handed a shovel to use in leveling off soil that had been dumped onto a parking-lot island by a huge loader.

Through that summer and those that followed, I kept at it with that same company, learning to build retaining walls, run planting jobs both large and small, bend steel for gunite pools and install complex drainage systems.

After graduating from college with the degree I'd sought in chemistry, I went right back to the landscape company and be-



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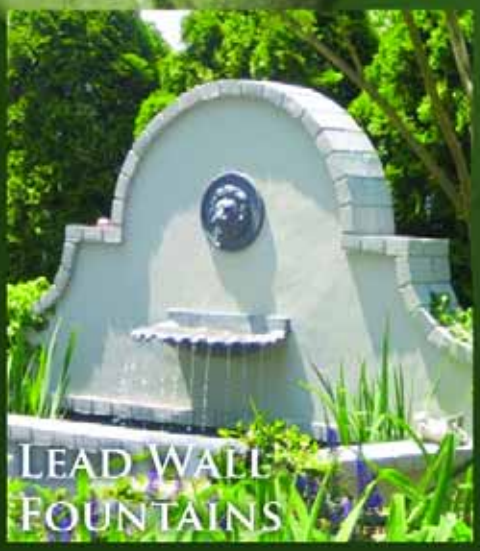

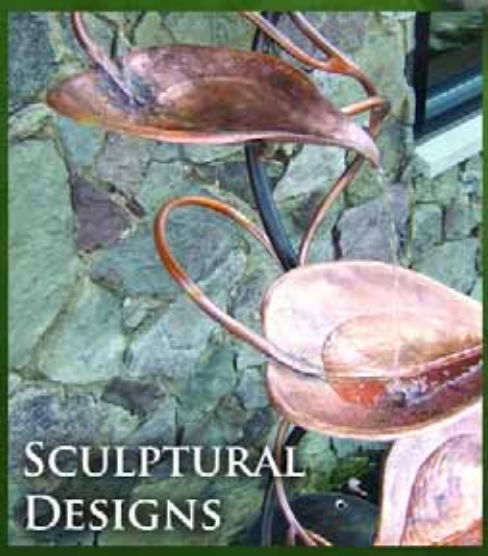

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gan the career I've pursued to this day.

Even then, I recognized that my four years of education at a very good school had basically prepared me for an entry level job in the vast field of chemistry – but that my summers had prepared me for success as a landscaper. As I saw it, the time I'd spent actually doing the work had been a far better sort of "education."

practical lessons

I started my own business in 1989, ready to landscape the world. I made mistakes, of course, and still find new ones to indulge in from time to time, but I make certain I learn from them as part of my own growth process.

I will freely acknowledge that a university education in landscape architecture might have helped me immensely, but at no time have I ever felt that it could have replaced those many years of field experience. Indeed, I think everyone should get *both* – that is, large doses of classroom study balanced by time on job sites.

Through the years, I've worked with lots of university-trained, fully licensed landscape architects on a number of different levels. One, for example, was an immensely talented designer who generated terrific ideas that worked beautifully – until, that is, you tried to implement his plans.

He'd never shot a grade (and had no idea how to do so); as a result, we almost always had to redesign things on site as we moved along. (We called him "Escher," because he would indicate changes in elevation that made no sense whatsoever – including steps that would drop down elevations only to match the elevation from which they'd just descended.)

I once worked with another college-fresh landscape architect on a group project: He spent the best part of four hours drawing a small elevation graphic while the rest of us designed and engineered the entire project. His drawing was utterly flawless and I've always been a believer in the value of great presentations. But in this case, great graphic skills didn't translate to the design or installation skills we needed at that time to get on with the project.

In another instance, I'd agreed to install a landscape according to a local landscape architect's plan. I liked what I'd seen of his work and the plan looked good, but when I met with the client on site, I saw that the designer had left out a key bit of information: He'd never shot the grades, so we ended up having to build a four-foot retaining wall to support the pool he'd placed within ten feet of the property line.

It's not all landscape architects, either – not by a long shot. I've had vast amounts of experience working alongside self-styled landscape designers who are clueless when it comes to design technique, history, plant choice, engineering or lighting design and basically go with what "looks good." I wasn't far from this when I first started out, so I won't cast big stones here. Suffice it to say that a lack of edu-

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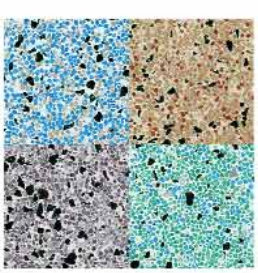

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cation paired with an absence of in-the-field experience is the worst-case scenario.

Allow me to repeat: I'm *not* knocking classroom education; rather, I'm saying that landscape architects need a roughly equal amount of field experience to go along with all that classroom education.

giving and taking

Before any landscape architects who might be reading this call for my head, please let me point out that the four biggest influences on my work through the years have been (in no particular order) James van Sweden, Topher Delaney, Frederick Law Olmsted and Steve Martino – landscape architects one and all.

What's interesting about this group is that all are more than university-trained landscape architects: They are true visionaries who understand environments and clients and embody immense artis-

Academic Water

How is it possible that schools of landscape architecture seem so universally to have turned their backs on education related to watershapes and watershaping?

So far as I know, the only landscape architecture program in the country that takes water seriously (other than as irrigation or drainage) is the one at California State Polytechnic University in Pomona, where my fellow *WaterShapes* columnist Mark Holden has been busy pressing his department to include watershapes-oriented course material in the curriculum.

As any of us who have worked with water know well, the design and construction of pools, spas, fountains and more is a discipline that can only truly be learned by doing, but classroom-based information offers a tremendous foundation, while continuing education has benefits that reach out to us throughout our careers.

In reading Mark's columns on his work at Cal Poly, I know he does all he can to get his students involved in real-world projects and situations, and I applaud his efforts. My hope is that others involved in curriculum development will see the value in what he's doing and will develop coursework that will follow his lead and the classroom/real-world balances he shoots for in blazing the trail.

– B.Z.

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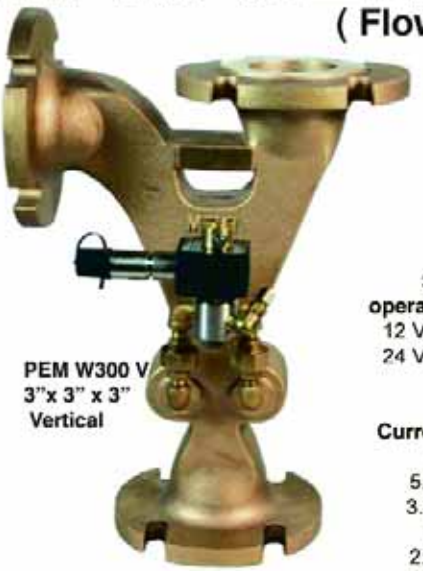

PEM W300 V
3"x 3" x 3"
Vertical

Standard operating Voltages:
12 VAC, 50/60 Hz
24 VAC, 50/60 Hz
24 DC

Current demands:
12 VAC
5.8 AMP. Inrush
3.4 AMP. Holding
24 VAC
2.9 AMP. Inrush
1.7 AMP. Holding
24 DC
0.48 AMP

PEM W115-1,
1 1/2" x 1 1/2"with 9-4 Stand,
1 1/2"Elbow Fitting,
W115-1236 Checkvalve,
PEM 815 Stream Jet

PEM W300 H
3"x 3" x 3"
Horizontal

PEM W300 H,
3"x 3"x3"
on W300 -11 Stand;
3" PVC Piping &
W300-412 Check Valve
PEM 873 Streamjet

PEM W116-1,
2" x 1 1/2"with 0200 Stand,
555 Swivel Union, 2" Coupling,
W115-1236 Checkvalve,
PEM 37 Stream Jet

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tic talent. Non-university-trained designers can have those same qualities as well: It's all a matter of taking those positive qualities and translating them to the real world by designing things properly and building them with integrity.

As I see it, there's a two-way street here: University-trained landscape architecture students should be required to work in the field – dig holes, carry bricks and do what they'll soon be asking *others* to do. They should gain firsthand knowledge of the ramifications of their designs and see things not only as polished presentations but as products people build and move through.

Conversely, landscape designers who learn their craft in the field should be required to learn top-flight graphic skills and amass knowledge on engineering, hydraulics and the environment as well as information on plants and their specific needs. Most local landscape associations (and all of the national ones including PLANET and APLD) have good and sometimes great education programs to go along with one big conference per year.

For landscape architects as well as designers, I would suggest that technical training in watershaping is of tremendous value. Personally, I've spent about 30 hours in the past few years in seminars organized by the Genesis 3 Design Group in which I've worked on my graphic skills and taken other classes that have advanced my water-related knowledge base.

Through the years, I've also attended numerous seminars at trade events – far too many to count at this point – and I'm also big on books, although when I read about engineering at night before I fall asleep, my daughter thinks I'm even more of a geek than she'd care to admit.

Personally, I've spent all the years of my lengthening career seeking to strike a balance between the classroom and the field. I am constantly trying to pick up new ideas, techniques and design treatments, and even when I travel to conferences to *present* seminars, I spend the rest of my time in other instructors' seminars, cramming as much into my head as possible.

It doesn't matter to me that none of this is required of me by any agency or licensing authority: I believe we should all be continuously educating ourselves in order that we may achieve our ultimate goal of providing our clients with dramatic, fulfilling, safe and usable exterior environments. WS

Bruce Zaretsky is president of Zaretsky and Associates, a landscape design/construction/consultation company in Rochester, N.Y. Nationally recognized for creative and inspiring residential landscapes, he also works with healthcare facilities, nursing homes and local municipalities in conceiving and installing healing and meditation gardens. You can reach him at bruce@zaretskyassociates.com.

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Section Dissection

By Dave Peterson

In my last "Currents" column (June 2009), I began a discussion of Project Manuals with an overview of these written specifications and other construction documents and how they are formally bound and made part of a project's contract documents. This time, we'll dig inside the manuals and take a closer look at what they contain.

Let me start with a simple recommendation: If you don't already work with Project Manuals in some form, now is probably a good time to get started – especially if you're a watershaper who prepares designs to be built by others, but also if your approach is to design as well as build. As I see it, having them is the surest way possible to ensure that projects are built as intended, whether it's by a separate watershape-construction company or by your subcontractors.

Practically speaking, this documentation clears the path toward ensuring quality installation. At the same time, it's also a way to impose responsibility for achieving that defined level of quality on every project participant through the entirety of the construction process.

If you don't already work with Project Manuals in some form, now is probably a good time to get started — especially if you prepare designs to be built by others.

one section at a time

To keep things organized, project specifications are generally individualized for each different type or category of equipment or assembly involved. In our manuals, for example, we have separate sections for Valves, Shotcrete and Startup Procedures rather than combining them as a single section, basically because the requirements for one have little or nothing to do with the others.

As assembled, the Valves section might include information on many different types of valves (ball, needle, swing-check, butterfly, vacuum relief and others), simply because the requirements you might list for one valve would be common to valves of other types as well. As an example, one requirement in the valve specification might be that "handles, when present, are to be positioned with the shaft oriented vertically" – unless the pipe run is vertical, in which case "the handle shaft should be oriented facing the front of the equipment." This is a requirement that applies to all types of valves, so there is no need to divide the valve specification by types and then repeat the information over and over.

Audience is another consideration in the organization of the individual sections. The Valves section, to use it as an example once again, will be reviewed by a plumbing crew that is highly unlikely to read the Shotcrete section despite the fact that the two trades interface at pipe penetrations. For this reason, it is common for specifications to cross-reference one another where coordination is an issue: Thus, the shotcrete information might comment on the potential for shadowing caused by the plumbing's waterstop flanges: In such a case, a reference to the plumbing specifications will provide more information about the size and potential locations of these flanges to guide the shotcrete crew.

The Construction Specifications Institute (*www.csinet.org*) is responsible for the organizational structure of the specifications and has divided the A/E/C industry into certain Divisions. It has also assigned Section numbers to keep one consultant's information from overlapping with others when

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everything is combined into a Project Manual. Watershapers are part of Division 13 – Special Construction, which includes Sections dividing the industry into specific categories, such as Section 131200 (Fountains) and 131423 (Amusement Park Rides).

Our specifications are mainly included in Section 131100 (Swimming Pools), but when we design commercial fountains, we renumber our documents accordingly. CSI's MasterFormat standard also allows for two-digit suffixes preceded by dots, thereby dividing disciplines into subcategories. With a pool project, for instance, we might name these subsections as 131100.01 (Shotcrete), 131100.02 (Valves) or 131100.03 (Startup Procedures).

Each of these sections can be prepared and maintained individually, but we prefer to place ours all in one big file that is currently 137 pages long and has some sections of a single page and others that have multiple pages. As we see it, keeping everything together makes individual items within the file much more "portable" as well as easier to edit. For example, if I add a requirement to the information I already have for "perforated drain-pipe used behind retaining walls," I may want to copy that same requirement to the specifications for pool subdrain systems that use the same perforated pipe.

The best way to keep specifications current, in our view, is to work with master listings before copying files to a specific project folder and then editing down. This way, work done once can easily be recycled for future projects. (And yes, there are database systems for maintaining these documents, but they're generally used by big architecture or engineering firms that maintain full staffs of specification writers.)

triple play

Within each Section there are three major parts: Part 1 – General (that is, administrative and procedural requirements for the section); Part 2 – Products (product and fabrication requirements in place before installation on the job site); and Part 3 – Execution (on-site requirements such as installation procedures and schedules).

- The **General** part of the valve specifications, for example, might require that the contractor submit to the architect or engineer the product cut-sheets for the actual valves that will be used. Our sheet might list a few manufacturers of approved ball valves, so the contractor can't simply substitute any alternative without written approval. The General part will also include things such as information on abbreviations, definitions, referenced standards (ASTM or ASME), sequencing, certifications, delivery, storage, handling and warranties. CSI's SectionFormat supplies the outline for these topics.
- The **Products** part will list approved manufacturers, materials, finishes, colors,

performance characteristics and other important information about the products or assemblies that will be basically ready to go when delivered. For example, our valve specification covers an Asahi/America Omni Ball Valve with Teflon seats and a CPVC housing that may be required for certain high-heat or ozone applications. The contractor will be held to this high standard as required in order to complete the installation at hand.

◗ The **Execution** part addresses the product or assembly in light of the installation itself. This might require specific installers or installer certifications, pre-installation testing (for, say, concrete colors), on-site protection, special installation techniques, interfaces with other work, startup, cleaning, close-out procedures and other tasks. The valve specification, for instance, would include requirements for priming and solvent welding using primers and glues identified in Part 2 – Products.

And if (for some reason) these primers, glues, Teflon tape, plumber's putty and other products are handled in another section (such as Plumbing), then the Execution part might simply make reference to that other section so the information is not duplicated.

CSI's format is somewhat rigid up to this point, such that if one or two of the Parts are *not* used they are still listed as being "Not Used." In the next levels down the hierarchy, however, the structure and content are treated with greater flexibility.

So far, we've looked at Divisions with multiple Sections (each having three Parts) as they are used to organize a Project Manual. Now we can further break the Parts down into Articles, Paragraphs and Subparagraphs – all of them filled with useful details.

◗ **Articles** are subjects within a Part that have one or more related paragraphs and subparagraphs. CSI includes a list of these Articles in their SectionFormat document, and if this system is followed (as it should be), it makes each section flow fairly well with a consistency of organization from one section to the next that makes things easier for anyone using the documents. (In the example provided as Figure 1 on page 30, the Articles are the bold items indicated as 1.01, 1.02 and so on.)

◗ **Paragraphs** are components within the Articles, and once again CSI provides a good outline to follow. In Figure 1, for example, the References article contains three Paragraphs – one each for Abbreviations and Acronyms; Definitions; and Reference Standards – all suggested by CSI and identified with letters per CSI.

◗ **Subparagraphs** provide further parsing of the information, and these are generally used by the compiler to cover topics suggested by CSI. In Figure 1, we show this with a subparagraph under Reference Standards in which we require that the contractor must use valves meeting the NSF/ANSI-61 Standard.

CSI's SectionFormat approach is quite thorough, but in common use it is unlikely that all sections will call for using the suggested range of articles, paragraphs and subparagraphs. That said, this layering of information can be quite useful in making certain a given product is used as the designer intends, for example, or in pursuing details related to a concrete mix design or preparation for plastering.

Another tool CSI has provided is their PageFormat standard, in which they describe how each page should be prepared with respect to formatting, fonts, margins, indentations, layout and other details. All that may seem trivial, but the overall purpose is to give everything a standardized look so that when all the sections are assembled into one Project Manual, it will be consistently readable.

taking control

In my first column on this subject, I suggested that anyone not using written specifications should start developing them by listing solutions to problems already encountered. At the very least, doing so should help eliminate repetition of the same difficulties.

Adding that point to the further introduction to Project Manuals provided by this column, I'm hoping that you're beginning to see how much more control the implementation of such a system will give you over your projects. It's easy to indicate that a ball valve, say, is required for a certain function noted on a plan, but if you leave that single detail to the contractor or subcontractor without further instruction, it is likely the product installed will be substandard, difficult to maintain or at best the cheapest available option.

There are, for instance, several swing-check valves that cannot be maintained and must instead be cut out and completely replaced. In our specifications, we remove the wiggle room, take full control of what can be used and make certain we require use of check valves that can easily be maintained or serviced without ever touching the plumbing.

In that sense, our specification sheets have become an approved product list that we have researched and validated. I've made some mistakes in product selection in the past – mainly because I've taken leaps of faith and given new approaches or technologies a try. Now we filter out that noise, using our documents as an approved equipment/assembly list.

This isn't to say we never use new products – far from it. It's just that now new products must prove themselves before becoming part of our standard list of recommended selections. In fact, what we've found is that specification writing done to follow CSI-formatted methods requires research – sometimes lots of it.

That's what makes these specifications so valuable to us: By the time I've finalized a particular specification or edited an existing one, I am reasonably confident in what I am recommending ("should") compared to what I'm requiring ("shall") and am assured that we'll never pick something knowing there's a better alternative. In other words, we choose the best for our clients, every time!

This in no way should be taken to imply that we use the same products or systems on every job. Each project is different, and one thing we particularly like about the CSI approach is that our file completely documents the performance criteria for competitive products.

In most of our projects, distinctions in competitive equipment are small

Figure 1

SECTION 131100.26

VALVES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: All valves and valve actuators installed for the watershape(s).

1.02 REFERENCES

A. Abbreviations and Acronyms:
1. ANSI: American National Standards Institute
2. NSF: NSF International, formerly National Sanitation Foundation

B. Definitions:
1. PTFE: Polytetrafluoroethylene, Teflon

C. Reference Standards:
1. NSF/ANSI-61: All valves shall be listed to NSF/ANSI-61-2008 Standard for Drinking Water System Components – Health Effects.

1.03 WARRANTY

A. Manufacturer Warranty: The manufacturer shall warranty the product free from defects and workmanship for 1 year.

B. Installer Warranty: See Section 131100.02 – Warranty.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Asahi/America, Inc. (Asahi)
35 Green St, PO Box 653, Malden, MA 02148-0134 USA
Web: www.asahi-america.com, Phone: 781.321.5409

B. Jandy Pool Products, Inc. (Jandy)
PO Box 6000, Petaluma, CA 94955-6000 USA
Web: www.jandy.com, Phone: 707.776.8200

C. Pentair Water Pool and Spa, Inc. (Pentair)
10951 W Los Angeles Ave, Moorpark, CA 93021 USA
Web: www.pentairpool.com, Phone: 800.831.7133

2.02 MANUFACTURED UNITS

A. Ball Valves, 3/4" – 3": Quarter-turn on/off with single body construction, PTFE seat backed by EPDM and rated for full-vacuum service. Body materials are PVC or CPVC as specified on plans. Omni Ball Valve manufactured by Asahi or approved equal.

B. 3-Way Valves, 2" or 2-1/2": 3-port valve for manual or electrically actuated diverting, shut-off or mixing. Body materials are CPVC. Where air temperature exceeds 104°F CPVC shall be used in lieu of PVC.

01/01/09 VALVES 1 OF 2 RESORT X
PROJECT # 131100.26 POOLS & SPAS

Manufacturer	Materials	Part Number
Jandy	CPVC	4717
Pentair	CPVC	263026
Approved equal	CPVC	

C. 3-Way Valves, 3": 3-port valve for manual or electrically actuated diverting, shut-off or mixing. Body materials are CPVC. Where air temperature exceeds 104°F CPVC shall be used in lieu of PVC.

Manufacturer	Materials	Part Number
Jandy	CPVC	4719
Approved equal	CPVC	

D. 3-Way Solar Valve, 2" or 2-1/2": 3-port valve for electrically actuated diverting plus drain-down via built-in check valve. Body materials are CPVC.

Manufacturer	Materials	Part Number
Pentair	CPVC	263047
Approved equal	CPVC	

PART 3 - EXECUTION

3.01 PREPARATION

A. Surface Preparation: Valves and pipe shall be primed prior to solvent welding even if the solvent manufacturer claims that primer is not required.

3.02 INSTALLATION

A. Special Techniques: Care shall be taken so that primer and/or solvent does not interfere or bond with the internal working components of the valves.

3.03 CLOSEOUT ACTIVITIES

A. Demonstration: All valves shall be operated fully open and closed in demonstration for the owners.

B. Owner's Instructions: Owners shall be instructed on the proper use and care of all valves.

END OF SECTION

FIGURE 1: Here's a typical Valves section from one of our Project Manuals. If this sort of structure is followed, it allows for remarkable clarity in communication about products and their applications – and gives a designer far greater control of how a project will look and perform once complete.

enough that their prices seldom vary by more than a hundred dollars or so, meaning we don't need to make firm recommendations. Some projects, however, will include specialized equipment such as very large engineered pumps or customized, large-diameter sand filters – in which case a competitive bid process could result in substantial savings. In the latter case, we may need to describe (in excruciating detail) all of the material and performance requirements of the equipment so that the contractor really is deciding on cost and not on qualities that we've already defined in the specifications.

We run into these competitive-bid situations mostly in publicly funded projects, or in instances in which the client already has certain products installed and wants us to stick with them so operator training is minimized and stocks of spare parts can be exploited. I think that's a great idea – with the sole caution being that, as the designer or architect/engineer of record, you're ultimately responsible for the specifications and can't just sign off on such a request without doing the research and at least recommending changes as necessary.

graphically speaking

Drawings are, of course, the primary vehicle for conveying graphic information, and specification writers are not in any way precluded from using them in Project Manuals. In fact, this can be a great place to stockpile product images

or specific drawings that will be valid for every project in which these products or systems are used. That said, I wouldn't want to use any *project-specific* graphics in this context; instead, I would use generic images such as details highlighting the code requirements for J-box heights above grade and maximum water levels.

Another great use of graphics in specs is for architectural items such as outdoor lighting. Here, the designer might set up a product specification for "Path Lighting" that includes, for example, photos of each fixture identified with a label (PL1, PL2 and so on) that matches the nomenclature used on the plans.

This enables the client to look at the plan and reference the specifications to determine exactly what to expect. Also, these details are easily recycled from one job to the next with little or no editing – and it all adds up to make the designer look like a complete professional. It's easy in this case to add a statement that not all fixture types will be used for the project – a note that will allow the designer to reuse the specification without further edits.

Personally, I also like to use a lot of tables in our specifications. It might just be the engineer in me, but I find tables useful in so many ways that I can't help forcing certain data into a table whenever possible. Whatever it takes: My ambition is to make these project documents represent my best thoughts on what should happen on site – and use them to make certain those who are doing the installation work have every opportunity to follow my plans to the letter. WS

Resources:

The accompanying text is no more than an introduction to the layers of detail built into Project Manuals and the specifications they contain. To learn more, you can take classes and even pursue professional certification as a specifications writer.

If you're looking for basic information, you'll find good references in the SectionFormat/PageFormat publication available from the Construction Specifications Institute on its Web site, *www.csinet.org.* It's available for a fee of $60 to CSI members, $75 for nonmembers.

– D.P.

Dave Peterson is president of Watershape Consulting of San Diego, Calif. He's been part of the watershaping industry since 1994, starting his own firm in 2004 after stints with an aquatic-engineering firm and a manufacturer. A registered civil engineer, he now supports other watershape professionals worldwide with design, engineering and construction-management services and may be reached via his web site, www.watershapeconsulting.com.

"After I sold my laser business to a Japanese company, I slept for about a month. Then I got up and thought, *Now what am I going to invent?!*"

— David Knox

The WaterShapes Interview

David Knox: Let There Be Shimmering Streams of Light

David Knox, founder of Lightstreams Glass Tile, talks about how and why he went from designing lasers for some of the nation's biggest technology powerhouses to creating and manufacturing small, shimmering works of art out of glass for watershapes. To Knox, it has been nothing less than a life-changing aesthetic and spiritual quest.

To read the interview with David Knox, go to www.watershapes.com and click on Interviews.

WATERSHAPES ONLINE


CAT

Luxury with a Twist

Root Design has always focused on developing environments that delight, inspire and occasionally surprise clients, but the project seen in this, the first of two articles, may well be the company's most elaborate to date. Here, Ben Dozier and Michael Percy describe what went into designing and building across the entire site, including the multiple watershapes that helped transform this estate into an oasis filled with plants, light, sounds and water.

By Ben Dozier & Michael Percy

Although it doesn't always work out this way, the best-case scenario for us at Root Design (Austin, Texas) is to accept full responsibility for all exterior spaces of a given property, from the footprint of the house out to the property lines. In these situations, our team is able to establish designs with wall-to-wall continuity in response to the environment, the architecture and our client's wishes.

We commit ourselves in these circumstances to taking homeowners and their guests on a journey, starting the moment they enter the property and moving all the way through to the yard's farthest reaches and all the spaces in between. Along the way, they'll enter a variety of small or large vignettes, conceal-and-reveal discoveries, dramatic focal points and multiple rewarding destinations – each conceptually linked as a coherent "whole."

In this case, we were called upon to develop all of the exteriors for a home on a two-acre lot in an affluent part of Austin. Better still, our work coincided with the construction of the home, so we were able to coordinate with the architect, interior designer and builder early on in order to value-engineer the construction process and control costs effectively. As you'll see here (and in a future article), our work offers an interesting perspective on what it takes to orchestrate connections between landscape architecture and pool construction.

At this writing, the project is almost complete. In this article, we'll cover the design process and construction of major exterior elements including several watershapes that serve as unifying elements throughout the design. Once the plants and trees have settled in, we'll revisit the site for a detailed pictorial tour.

Rustic Grace

Our practice is largely guided by the idea that good architecture is *edited* architecture. Our client, for example, had many ideas about what he wanted, starting with a central courtyard; a private spa off the master bathroom; and a large swimming pool he envisioned as a key feature in the project. That was all good, but beyond that outline our client allowed us to develop the overall program with complete creative freedom, allowing us to link each element through a series of exterior spaces while harmonizing everything.

His prerequisites, in other words, gave us a promising start – and so did the work of the other designers on the project: The Hacienda-style building had been perfectly sited on the lot, woven through stands of mature live oaks spread across a gently sloping topography. The architecture was to include plentiful use of stone, large structures made of reclaimed beams, grand archways, a barrel-tile roof and, best of all, open views to various outdoor spaces being programmed around the site.

The house is a true reflection of site conditions, giving it the appearance of having always been there, and we knew that every design decision we'd make would be focused on preserving and enhancing the home's connection to the land. This was, in effect, the foundation of our design and, ultimately, our driving force throughout the construction process.

As a key part of the conceptual design process, we generated a comprehensive set of drawings that illustrated primary exterior areas. All done by hand, these sketches were used in conjunction with photographs selected from our own portfolio as well as fully credited images illustrating the work of others. In this particular case, all of the material was organized on "story boards" we shared with the client. We also assembled sets of images demonstrating our ability to blend architecture and landscape, blurring lines in such a way that you can't tell where one begins and the other ends.

Throughout the presentation, there was plenty of spirited collaboration with the client, particularly when it came to our strategies for connecting the formal and functional with the historic and aged. When he'd taken in all of the sketches and began to perceive the overall program we were advocating, the flood of questions about details fell away and the leap of faith was taken: In fact, he became so distinctly excited that all he had to say, finally, was "When can you get started?"

A Rewarding Journey

The site's layout and the design of the home lent themselves perfectly to creating a sweep of visual action that would fully engage anyone visiting the property. Accordingly, we deliberately defined a sequence in which the visitor would constantly be discovering new areas by moving and being drawn through the space, always with water serving as a unifying element.

Let's set the scene: As you drive through

COURTYARD DESIGN

Through the large wooden doors at the entry, a tropical oasis draws visitors into this intimate space.

The combination of the densely planted garden along with the trickling sound of the water runnel will let visitors know this is a special place.

A circular fountain located at the center of the courtyard will anchor the garden. This fountain can contain aquatic plants and koi fish.

Detailed plantings underneath broad leaf tropicals provide surprises for those that stroll the garden while also softening the paved edges.

The water runnel will lead to an arched opening in the wall near the entry of the courtyard and will connect the courtyard water features to the entry fountain.

The architecture of the home gave us tremendous inspiration: The Hacienda-style composition was sited perfectly and used materials and details we knew we could carry well beyond its walls in developing exterior spaces. In presenting our ideas to the client, in fact, we spun off the house in creating 'story boards' that laid out our ideas in the form of drawings supplemented by photographs from other projects showing our capabilities.

the large wooden gates at the edge of the property, you are led to a circular entry court. A formal stone pathway finished with native limestone then guides you to massive, reclaimed-wood doors that seem to be the entrance to the house. The only hint that this might not be the case is a semicircular, ten-foot-diameter pond placed to the right of the doors' landing: Water seems to flow to it from under a low arch that penetrates the wall. From this point, you also hear water flowing on the other side of the wall – a definite spur to curiosity.

Opening the door, you find yourself a good 80 feet from the home's main entrance, which stands at the far end of a large courtyard. The first few steps are under an arched loggia, and to the right is a long runnel, the source of the sound first heard from outside the doorway.

The courtyard is really the heart and soul of the project: Designed around mature live oaks and completely enclosed on three sides by the house, the space is recessed five feet below the building's floor level and is surrounded by outdoor porches and living areas that overlook the courtyard on all sides. It truly is the social core of the design.

Absorbing all of this, you follow a line parallel to the runnel, up the courtyard toward the front door. Along the way, you discover that the runnel carries water from a central fountain to the pond off the driveway.

The five-foot-dameter fountain is the courtyard's central waterfeature. When completed, its basin will host aquatic plants that will add interest and color to the setting, and the whole assembly will be topped by a sculpture that's being hand-carved by sculptors in Mexico. (Although the surrounding area is spacious, we definitely didn't want the fountain to take over, so we scaled it down to make it both intimate and more inviting.)

Beyond the water, the courtyard is planted with a host of mostly broad-leafed plants, including a range of palms intended to give the space a Mediterranean or even a tropical ambiance – all very different from what is typically seen in central Texas. We felt comfortable moving in this direction because the courtyard is so well sheltered by a light-filtering canopy of live oaks: As we saw it, injecting this exotic flavor would be a key part of the overall impression we wanted to make.

To get to the main entrance, you walk around the back of the fountain, finally reaching a set of steps that leads to a porch. By now, you have already experienced an encompassing sanctuary that simultaneously feels luxurious and very private.

Viewing Through

In walking through the door, you immediately look right through the great room's floor-to-ceiling windows and through arches out over a broad deck and the swimming pool, in effect leaving behind one area defined by water and immediately getting an invitation to explore another.

The pool features a deck-level perimeter-overflow detail: The rationale for this thoroughly modern touch in an otherwise Old World design is the fact that we wanted to bring the water right up to the deck's grade, which is in turn dead level with the floor of the home's interior spaces. As we saw it, doing so would increase both the viewability and the reflectivity of the water's surface and make the whole scene more immediate and dramatic.

Given all this, it's no surprise that the pool was the subject of most of our discussions with the homeowner. We had originally submitted a design that was far simpler and more traditional, but we believed so strongly in the more aggressive perimeter-overflow approach that we submitted it as well – then good-naturedly (but quite directly) challenged the owner to show some nerve and take the riskier path.

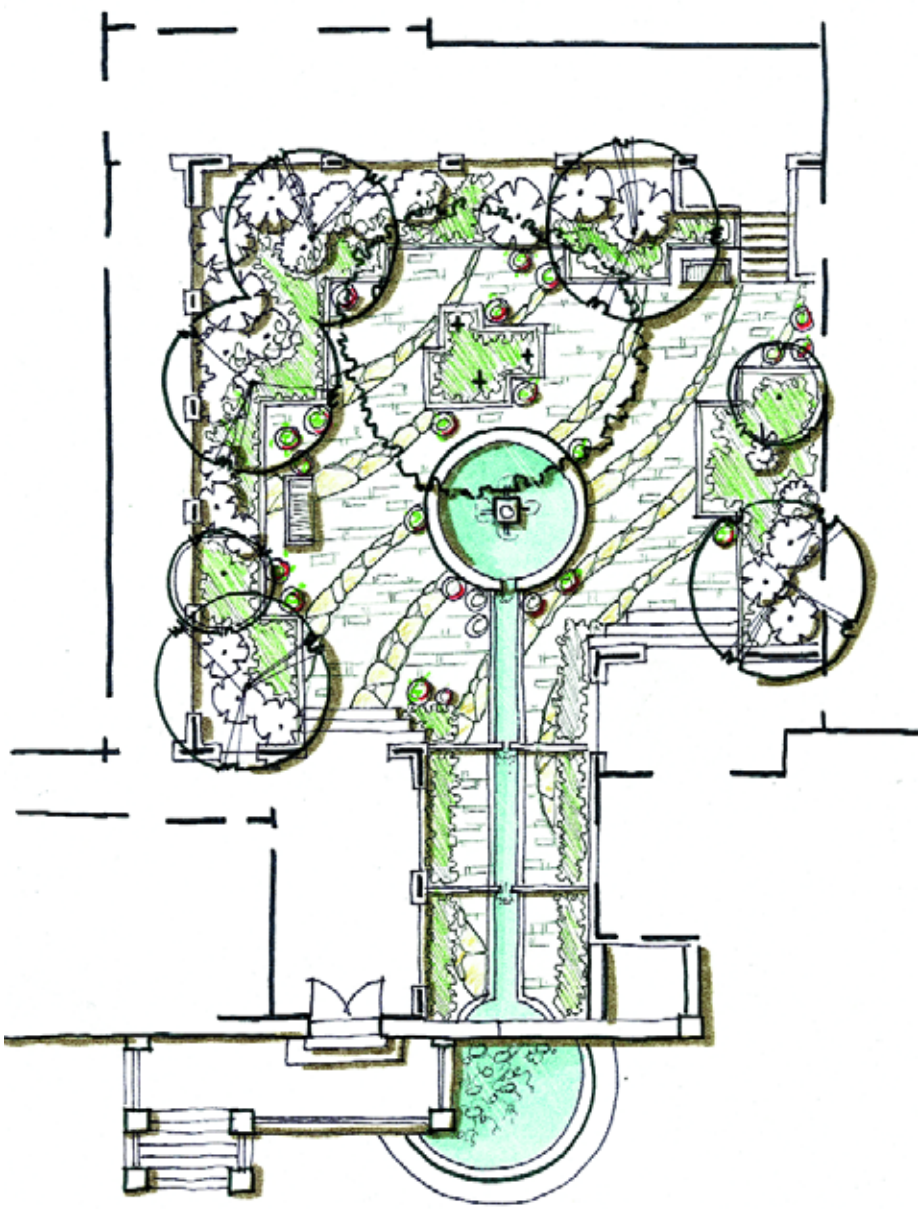
Whatever was said, we have no regrets because it prompted him to step up and commit himself to making a stronger impression.

Much of the pool's perimeter involves a series of right angles flowing into slots, but to the left (from inside the home) is a beach entry with irregular, undulating contours. The decking (along with the beach entry's submerged surface) incorporates a native limestone that received a "brush" finish, giving it a worn and aged appearance. (We also used this material on most of the horizontal surfaces around the property.)

The pool is 55 feet long (up to the waterline of the beach entry) and about 24 feet across at its widest point. The main deck area is off to the right – alongside the pool's deep end and adjacent to its square spa.

The pool's interior is finished in a dark pebble material that increases the water's reflective qualities. The water spills over into a half-inch slot, entering the gutter

The courtyard sets the tone for the entire project, serving as a social core of the home for the family and their guests and guiding visitors on an extraordinarily peaceful journey from the front gate to the entry door. As is the case with all of the main spaces of this project, water is the key: A long runnel greets those who enter, and an appropriately scaled fountain draws them through to approach the front door.



system and ultimately flowing to the surge tank. The heaters and the circulation system – including the pumps, filters and controllers – all came from Jandy (Vista, Calif.). The water is treated using an ORP-governed, in-line Rainbow Lifegard chlorine feeder (Pentair Water Pool & Spa, Sanford, N.C.) supplemented by an ozone-generating system from DEL Ozone (San Luis Obispo, Calif.). The pool also has an in-floor cleaning system.

With eight pumps, four filters, two heaters and a host of other components, the equipment pad became large enough to justify the design and construction of a structure to conceal it and knock down any noise it might generate. This became a casita-style outbuilding that's consistent with the architecture of the home.

As a side note: When we finished the pool, the owner was so pleased with the view that he had the builder knock out a portion of one of the home's exterior walls to create an additional vantage point from inside the home. At that point, we were fully confident that we had completely nailed the pool design.

Upward Spiral

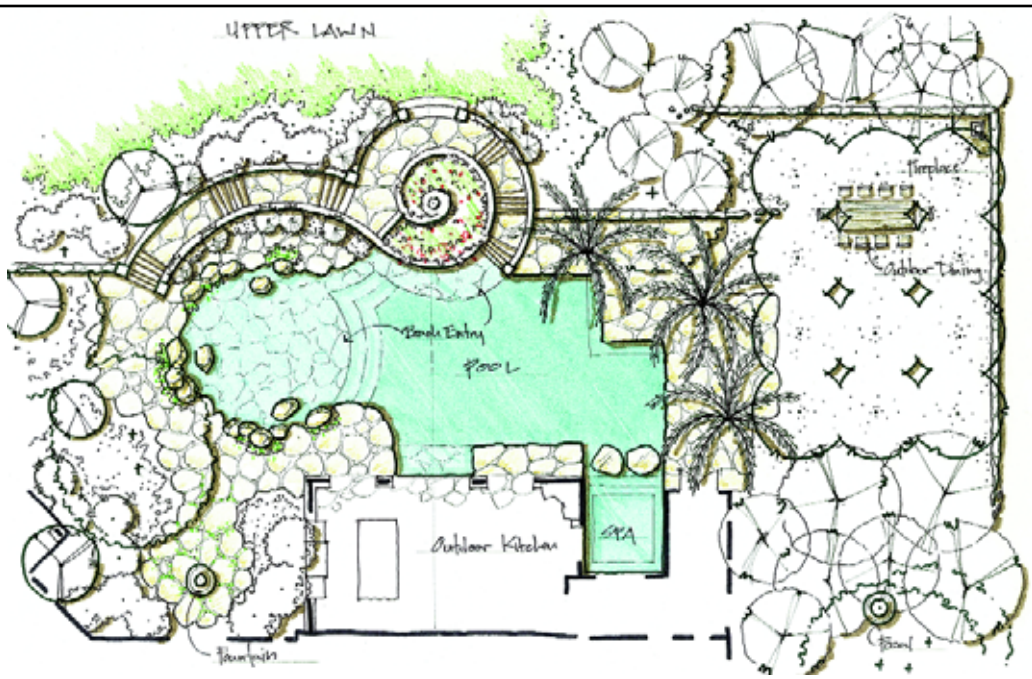
The most unusual and by far the most difficult element of the entire project is the spiral retaining-wall system that rises above and serves to define the landscape configuration on the pool's far side.

As noted above with the perimeter-overflow detail, we'd already met with success by challenging the homeowner to think of being unique. In this case, we went after both unique *and* breathtaking in pressing him to make this twisting hardscape feature the core of the backyard space. Although it turned out beautifully, it also reminded us to be careful in what we ask for, as this structure turned out to be among the trickiest we've ever built. The shape was so difficult to achieve, in fact, that we actually built it three times, tearing out the first two attempts.

As finally completed, the spiraling walls rise above a small deck area just beyond the pool. To the right side, a set of solid stone steps rise some six feet above the pool to a point behind the spiral's center. Water flows directly down these steps, originating with a narrow weir under the top step. On the left side of the twisting structure (reaching out past the pool's beach entry) is a dry stone pathway a visitor can use to reach the top of the spiral.

In structural terms, this feature serves as a retaining wall holding the slope above the pool in place. We made it using concrete masonry units (CMUs) up to grade. Above that, the wall is made of flat limestone pieces and is basically

When visitors enter the house, the first thing they see is more water in the space just opposite the door in the form of a large swimming pool that includes a sheltered spa as well as a beach entry. The visual keys to this space are the sweeping curves on the far wall – and the spiraling structure that rises above them.



hollow. The difficulty came in executing the tight curves: It took extreme patience and involved several days of frustration and headaches – but eventually it all worked out.

Keeping with the ziggurat theme, the spaces in the structure that aren't devoted to the wetted stairs or the pathway will be filled with multiple layers of plants that will cascade over the walls in a hanging-garden effect. All of these details are important, as the spiral stands dead center in the arch that defines the main view from inside the house.

Climbing to the top of the spiral, the visitor gains a 360-degree view of the entire backyard landscape, including the formal lawn stretching above the pool. At the highest point, we'll eventually be placing an 18-inch fire bowl – a feature that will be seen from the house and most surrounding areas.

Just as the courtyard is the defining element in approaching to the home, the spiral serves as the hub of the entire backyard. Filled with visual energy and building a sweeping sense of motion, it engages the eye in a way that coaxes the visitor to look around and absorb the presence of water, plants, landscape elements, decks and various surrounding structures. The visitor atop the spiral also sees the trees and plants that serve as a backdrop for the rest of the property. In that sense, the spiral form serves perfectly as both a means to encourage movement and organize views.

As mentioned above, the area above the pool has been fashioned into a large, rectangular lawn area bound by low stone walls. (The owner has a nine-year-old son and wanted a broad space for play with family and friends.) The lawn is to be manicured to a fairway-like quality. At one end, the low walls reach out as a semicircle that eventually will host a large sculpture– another destination as the visitor ventures into spaces past the pool.

Beyond the Core

The lawn area is just one of several backyard "rooms" we established around the core formed by the pool and the spiral structure.

Close by the water (to the right side as you enter the space) is a stand of palm trees that create a visual break between the pool and the areas just beyond. One of those areas is an outdoor dining space surrounded by a nine-foot-tall stone wall and a large arbor constructed of reclaimed stone and beams salvaged from various buildings. In overall affect, this outdoor room gives the impression of being the ruins of an older settlement, built long ago. The massive structure is softened with grape vines that weave around the arbor's rusted steel trellis. There's also a table that seats 12, and the whole area is illuminated at night by a set of custom-made chandeliers.

Located within the ruins is a massive outdoor fireplace. Flanked by a mature, transplanted olive tree and separated from other spaces by a stone wall, this room is intended as an after-dinner lounge – perfect for enjoying a snifter of cognac under the stars in a fire-lit space. The wall, by the way, blocks the view of areas stretching to the back corner of the property.

That blockage is deliberate, of course: What's hidden back there is a recreation area that includes a putting green and a half-court for basketball. The client specifically wanted these features, but he also saw them as visually unappealing, aurally disruptive and a departure from the rest of the design program. As a result, he asked us to do whatever it took to make them unobtrusive.

The fireplace area and its wall go a long way toward making them disappear from view on the right side of the property. But we also carefully studied the sight lines and set things up in such a way that you can't see the concrete of the basketball court from the house or the pool area – the keys here being a sweeping row of rocks we dug out of the ground on site and moved to a key location; a stand of olive trees that mask the putting green and sand trap; and the natural flow of the slope, which tends to hide that corner of the lot anyway.

It all works so well that you discover these recreational areas only by moving along a stone path that runs along that side of the property.

The farthest-removed part of the par-

cel – out directly beyond the lawn – is the project's least structured component. To reinforce that sense, we'll be bringing in native grasses and other local species and making the spaces we've organized give way to untamed nature at the margins. A number of live oaks provide a beautiful backdrop for this effect, and we'll cut winding trails through the area to encourage traffic – rewarding visitors who wander so far by creating small destinations, perhaps with artwork and seating areas.

We are aware, of course, that from a design standpoint it makes sense to let the outer reaches of large properties exist as "natural" spaces. To be frank, however, treating these outer areas in an unstructured way enabled us to gain some ground on a budget consumed by the detailing of the courtyard, pool, spiral structure, orchards and fireplace.

Moving Toward Completion

The informal, perimeter "veldt" will ultimately wrap around the entire back of the property and along its left side – up until it runs into a wing of the house in which the master suite is located.

Just outside this bedroom, we're establishing a private retreat that includes a spa intended to appear as though it's the outflow of a natural spring. Along the way, we've often joked that it's the largest gunite spa ever built for two or four people: The shell is quite large at fully 14 feet across: We needed this bulk to support the large boulders we'll be using to create the spring illusion. In fact, the actual seating area inside the spa will be no more than six to seven feet across.

To enhance the natural-spring effect, we're including a highly unusual detail in which water will flow gently into the spa through gaps in the bases of the stones encircling the spa's interior space. We're working on this arrangement at this writing, and it's proving to be quite a challenge to create a naturalistic appearance *and* make the spa comfortably functional. By the time we're done and everyone is satisfied, we're confident this will be one of the most unusual inground spas *anywhere*.

To ensure privacy, the spa area will be enclosed by an eight-foot wall fitted with a wooden gate that will allow access from the yard. We will be taking advantage of the humidity generated by the spa to fill the space with delicate tropical plants, including several species of orchids.

In this particular area and in the grander space, there was a collaborative effort between ourselves and the client in working in detail with a range of additional tradespeople, including the landscape lighting artist, the crew that installed the mosquito-repelling system, the ornamental-vessel craftspeople, the wonderful ironworkers and furniture fabricators, the irrigation specialists and an outdoor-sound-system installer. All of them joined us in fulfilling the overarching design philosophy.

By the time we're through, we figure there will be hundreds of fixtures of all kinds in place to mark paths and stairs, create moonlight effects and cast beautiful music throughout social spaces. And we're still in the process of commissioning artworks to add final touches to some of the corners we've designated throughout the gardens.

Designing and constructing of all this has been a huge undertaking, and we're not finished yet – but we're moving for-

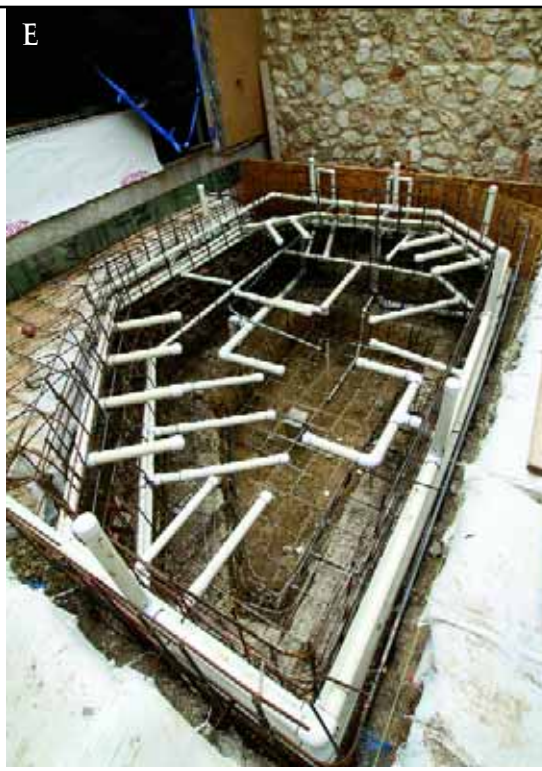
ward confident in all of the major design elements we'll be following through to conclusion.

At this point, we're satisfied that not only have we pushed our own creative boundaries, but that we also have done so while honoring the space, the architecture and our client's desires. In doing so, we have given him the confidence he's occasionally needed to step outside the box. His enthusiasm has been unbounded and fills us with a fire that drives us to do everything in our power to make him even happier.

As is often the case in projects of this sort, we are all looking forward to an evening gathering during which we will enjoy the setting as it's been meant to be experienced. It might just be an appropriate time to enjoy a drink – with, of course, a twist!

We developed the property from the footprint of the house out to its perimeter boundaries, so we were involved in much more than the two main watershapes depicted previously on these pages. The equipment pad (A), for example, will ultimately be housed in a casita-style outbuilding; the spiral structure rising above the pool (B and C) will retain the soil above the pool while providing the core image for the backyard; the dining area and fireplace (D) will suggest ruins of a much older structure that had been on the property forever; and, finally, a private spa off the master bedroom (E and F) will to give the impression of being fed by an ancient natural spring – wall-to-wall details that define this amazingly intricate project.


D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F

The Elevated Game

Materials scientist and concrete expert George Yoggy has studied the shotcrete and gunite processes for more than 50 years, focusing not only on tunnel and mine construction but also turning his eye toward watershapes. Here, he reviews industry standards for the density, strength and permeability of pneumatically placed concrete shells and urges watershapers to step up and adopt standards and practices followed by others in the concrete industry.

By George Yoggy

In the world of concrete science and application, innumerable variables have an influence on whether a concrete installation is successful or not. These include but are not limited to the skill of the applicator, the suitability of the mix design, the temperature at the time of application, the equipment used, the water-to-cement ratio and the size of the aggregate.

For all the seeming complexity, however, the nature of the material itself invests the process with a few immovable facts. One of these directly undermines the swimming pool industry's "standard" that calls for a compression strength of 2,500 pounds per square inch for pneumatically placed concrete (that is, gunite or shotcrete). It's not because the standard is inadequate *per se*; rather, it's because it is virtually impossible, with proper application, to produce a gunite or shotcrete structure at such a low level!

If that comes as a surprise to you, read on: To explain why no such thing as 2,500-psi pneumatically placed concrete exists, we first need to examine the nature of concrete and then take a look at the developmental history of the gunite and shotcrete processes.

Through the Pump

The main reason behind the impossibility of 2,500 psi gunite or shotcrete has to do with the velocity at which the material is applied. As it moves past the nozzle, the concrete strikes the substrate with such force that it is inevitably compacted – meaning it will always have greater strength than you can achieve using cast-in-place methods.

So regardless of the mix design, the resulting structure's density (or compressive strength) will be *at least* 4,000 psi in the shotcrete (wet) process and even greater with the gunite (dry) process. Without significant errors in application (to be discussed below), you simply cannot avoid producing shells with compressive strength far exceeding 2,500 psi – which means the industry standard is essentially meaningless.

Moving past that observation, let's look at some other concrete fundamentals.

First of all, it's helpful to know that the terms "gunite" and "shotcrete" are essentially verbs rather than nouns, and refer to processes and actions rather than to results. The stuff that constitutes the shell of a swimming pool or spa or fountain, in other words, is *not* gunite or shotcrete but is, in fact, simply concrete – *concrete placed pneumatically at high velocity*, to be more exact.

The nature of these application methods has a direct effect on the mix design of the concrete. If you're pouring a footing for a home or a column for a building, for example, standard practice dictates use of a fairly coarse aggregate in inch or inch-and-a-half dimensions. With the gunite or shotcrete method, by contrast, the material has to move through a hose and nozzle, which means you must downsize the aggregate considerably and increase the amount of sand in the mix

to make it flow properly.

By definition, concrete is a combination of coarse and fine aggregates coated and bound together by cement paste. By *decreasing* the size of the aggregate, you effectively *increase* the surface area of the aggregate and thereby increase the requisite amount of cement. In other words, the amount of cement required in the mix is determined by aggregate size and the aggregate's resulting surface area.

For comparison, if you were preparing for a cast-in-place application using inch to inch-and-a-half aggregate, the production of a cubic yard of concrete would require inclusion of 500 to 550 pounds of cement. If you were to downsize the aggregate to three-eighths of an inch (as is generally found in gunite and shotcrete applications), that same cubic yard of concrete would have to include 650 to 750 pounds of cement in the mix to accommodate the greater surface area. These differences in aggregate size and cement content will, all other things being equal, result in stronger concrete in the latter case than you could achieve in the former.

And if you combine smaller aggregate and more cement with the velocity mentioned above, the product will inevitably exceed a compressive-strength level of 4,000 psi.

Filling Voids

Let's paint this picture with a bit more detail, starting with the fact that the aggregate in concrete generally constitutes about 65 percent of the mix. The key beyond that is use of material that fills the voids so the finished product is solid.

Consider a jar filled with rocks: A relatively small number of larger rocks will fill the jar to capacity, but this leaves substantial voids. To fill them, you add smaller rocks that fill in much of the empty space, then add sand to fill the even smaller voids. Finally, you add water, which fills the tiniest of the remaining spaces.

The same principles apply with concrete, and that's true even with the small starting aggregates used with gunite and shotcrete, although filling these voids means using greater amounts of fine aggregate (sand) and more cement to ensure that there will be enough cement paste to cover the increased surface area of the smaller aggregate. The upshot of this manipulation of the mix is increased density – and, therefore, higher levels of compressive strength with gunite and shotcrete.

When you combine all of this, it's easy to see why people who work with gunite and shotcrete in constructing mines and tunnels scratch their heads when they see that the pool industry has pegged its standard at 2,500 psi and are forced to wonder further if watershapers have any clear sense of the nature of the materials and processes they're using.

Yes, you can achieve that low, 2,500-psi level of compressive strength using cast-

in-place concrete, but to do so with the gunite or shotcrete methods, you would have to *torture* the process with improper practices to get there – perhaps by mishandling mix times relative to temperature or repositioning the concrete once it's been placed or using rebound (with the latter two possibilities technically meaning that the concrete is no longer "pneumatically placed") or engaging in any of a host of other possible abuses.

The point is, if you manage to produce pneumatically placed concrete that has a compression strength of less than 4,000 psi, *by definition* it must be considered substandard because something had to have gone terribly wrong to produce such a result.

I believe that this has flown under the radar for so long because, compared to other applications, the preparation of shells for watershapes is not critical in construction terms. With an average pool, even 2,500 psi concrete that is coated with plaster and filled with water will be strong enough to hold that water in place and resist most ground forces. The proof of the pudding is the fact that most pools do not fail.

That said, however, if the water table changes or the plaster fails or there are soil conditions that create dramatic movement or differential settlement, it may very well prove to be the case that a substandard concrete product will be *entirely* inadequate. And at a time when increasing numbers of vessels have more daring shapes and performance features (including perimeter overflows and vanishing edges), the resulting structural variables make the strength of the concrete a more critical factor in the product's ability to withstand the tests of time.

In other words, as the watershaping industry elevates the artistry and technical sophistication of its designs, the issue of proper application becomes far more important. The plain fact is, these are jobs that must be done right – first time, every time.

Backing Up

Let's put all of this information in a grander historical context to understand where misunderstandings about the nature of gunite and shotcrete might have emerged.

Briefly, the "cement gun" was invented in 1909 by Carl Akeley (who, by the way, also invented the movie camera). He was working at the Chicago Museum of Natural History, patching and modeling prehistoric animals, and was frustrated by the constant need to prepare fresh batches of plaster and Portland cement, much of which went to waste before he could use it.

An inventive sort, he noted the need for a ready flow and supply of cementitious material and developed a system in which dry cement mix was contained in a pressurized container. He attached

a hose and developed a nozzle assembly that had the ability to add a measured flow of water to the mix as it exited the nozzle. Along the way, he discovered that he created a superior product by adding sand – and the rest is history.

Before too long, Akeley's invention was commercialized by the Cement Gun Co. of Allentown, Pa., which marketed the system as Gunite. After extensive testing and product development, it was determined that the ideal velocity for the process was between 350 and 400 feet per second – a standard applied to this day and one always recognized as a critical factor in the strength and quality of the finished product.

For the next 20 years, Akeley's system met with amazing success and rapid acceptance, and it wasn't long before a swimming pool was constructed using the Gunite process.

That happened in 1932 at Lehigh Valley Country Club in Allentown, which made sense because the owners of the Cement Gun Co. were club members. It was an experiment, but from the start they knew pools and pneumatically placed concrete were a perfect match – and the modern pool construction industry was born.

Fast forwarding to 1962, the country club decided to update the pool with a new plaster surface as well as some new skimmers and light niches. They hired a contractor who, after a day or two of chipping at the old concrete, went back to the club's board of directors and asked for financial relief because the shell was so hard that he was going through drill bits and bull points at such a pace that he knew he'd lose money on the job.

This was no surprise to the folks at the Cement Gun Co., who had learned a lot about their product in the intervening years and had done a great deal to standardize its use. Indeed, their work rests, to this day, at the core of standards recognized and maintained by the American Concrete Institute (ACI) as well as the American Society of Testing & Materials (ASTM).

I might add that *nowhere* in that vast body of knowledge will you find *any* ref-

This 1949 publication from The Cement Gun Co. recalls the earliest known use of gunite in the construction of a swimming pool as far back as 1936 in Allentown, Pa.

erence to 2,500-psi pneumatically placed concrete. In fact, studies dating to 1915 show conclusively that, when delivered at velocities of 350 to 400 feet per second, properly mixed and hydrated gunite is superior to cast-in-place concrete in bondability, density, permeability and compressive strength. Straight through the 1950s, it was generally recognized that pools built using the Gunite process were of the highest available quality and structural strength.

Rapid Expansion

The tide began to turn as early as 1952, when the contracting division of the Cement Gun Co. went out of business and the parent company concurred with ACI's recommendation that it should cede its exclusive control of the Gunite process and open it to the industry. At that point, small-g gunite came on the scene.

At that time, the modern American suburb was emerging – and swimming pools were becoming an increasingly popular addition to single-family homes. With that expanding business base, numerous swimming pool contractors entered the marketplace, pioneered the concept of the middle-class swimming pool and pulled a new generation of gunite-application companies into the mix.

Without the licensing authority of the Cement Gun Co. to guide this development and train application crews as it had in the past, however, the gunite business became less disciplined and more inconsistent with respect to product quality. That gradual decline never happened in critical applications, because work on mines, highways and tunnels necessitated pursuit of very high sets of standards. Where pools were concerned, however, that same necessity did not apply and, in many quarters, a fundamental understanding of both the gunite process and product were lost.

Even so, gunite dominated in the pool industry straight through the 1960s and into the '70s. That situation began changing by 1972, with the advent of the concrete pump and the development of the "wet" or "shotcrete" process, which really took hold in the pool market late in the 1970s.

Proper use of either the gunite or shotcrete processes flows from a well-established body of knowledge based on years of experience in applications in which the success of projects is a matter of life or death, not of guesswork or old habits.

Today, the shotcrete process is considered by many to be superior to the gunite process as a result of the consistency and reliability of batch mixes compared to the street mixing used in the gunite process. Truth is, during shotcrete's early years, the product went through some difficult growth stages.

Mostly, these issues had to do with attempts to increase the pumpability of material: Early applicators had trouble controlling (and even holding onto) the hoses, so velocities and hose sizes both began to shrink. The result before long was that applicators weren't so much *compacting* concrete as they were simply *stacking* it – a situation that was eventually and thoroughly rectified with improvements to shotcrete rigs and equipment but led to development of some bad habits along the way.

At the same time, market pressures led to some changes in the mix that resulted in production of weaker concrete, all in the name of minimizing costs. During the 1980s and into the '90s, it was also common to encounter problems with concrete staying in mixers too long; with too much water being added; with the use of rebound; and, in some situations, with the addition of detergent admixtures to ease pumping. All of these factors conspired to result in terribly compromised concrete products.

This unsteadiness in the face of a changing marketplace is, I believe, what led to the odd notion that 2,500 psi strength was acceptable, even though the practices that had led to that assumption were completely substandard.

None of this, I might add, ever altered the fact that proper mix designs and application velocities were resulting in compressive strengths of 4,000 psi or better: The truth is that watershaping applications simply haven't been classed as critical in the concrete industry and therefore attracted little technical attention – a situation that has changed in recent years with the development of more advanced and intricate designs.

The Right Stuff

As I see it, the watershaping industry can easily catch up and get back on track with the rest of the concrete-using industries with a simple, direct process of education.

Training for concrete application, for example, already exists in the programs of the American Concrete Institute, the American Shotcrete Association and the Portland Cement Association. The specifics of proper concrete application – that is, what's involved in rising to ACI, ASA or PCA standards – are not terribly complex, but they do require basic training.

What has happened through years in which outright product failures were rare is, in my opinion, that watershapers had latched onto the idea that common practice informally handed down through the years was sufficient in getting the job done. While that may arguably have been adequate practice at one point in time, it is increasingly less defensible: It's time to step up and get acquainted with how things should be done rather than how they've been done in the past.

There are no secrets or scientific mysteries at work here: Proper use of either the gunite or shotcrete processes flows from a well-established body of knowledge based on years of experience in applications in which the success of projects is a matter of life or death, not of guesswork or old habits.

I applaud those in the watershaping industry who've started a critical evaluation of the way things are done and have changed their application processes to conform to the concrete industry's standards. It's the practical thing to do – and the right one as well.

The Permeability Debate

Beyond the increasing creativity of watershape designs, another issue that is pulling the watershaping industry back into the fold of the greater concrete industry is a growing set of discussions about permeability and the level to which pneumatically applied concrete – whether gunite or shotcrete – should or can be classed as permeable, slightly permeable or impermeable.

We can all accept the thought that pools, spas, fountains and other bodies of recreational and decorative water should be able to contain water. What many people also accept – erroneously – is that pneumatically placed concrete is, by nature, permeable. That is so only in an environment in which substandard application practices are acceptable.

In fact, the permeability of pneumatically placed concrete structures is a non-issue: When you use a proper mix design and combine it with proper application methods, the resulting 4,000 psi (or greater) material is classed as having low permeability – meaning that even without a lining in the form of plaster or an exposed-aggregate finish, the shell itself should hold water.

What many contractors fail to realize is that the "business end" of the concrete is the side that comes in contact with the soil: This is the surface exposed directly to groundwater with no more than density to prevent intrusion of a sort that can corrode reinforcing steel. When the concrete is less permeable, it protects the structure's integrity; conversely, if the shell is more permeable, it's at far greater risk of failure.

In assessing the permeability of concrete, scientists measure the passage of chloride ions that travel with water as it enters the material. Just as the compressive strength of properly applied pneumatic concrete is a well-established scientific fact, so, too, is the permeability of concrete. In this there is no dispute: 4,000 psi concrete has low permeability and, with proper concrete coverage of reinforcing steel, will protect itself from intrusion of potentially corrosive groundwater.

It all adds up to a simple picture: With proper compression resulting from proper mixing and use of proper application techniques, pneumatically applied concrete is virtually free of voids, has low permeability and will withstand the tests of time.

– G.Y.

EYES ON THE SKIES

It's not his daily practice to install watershapes in conjunction with computer-controlled telescopes, but that's just what Jim Wilder had to do in creating a reflecting pool to surround a towering pyramid atop which an observatory now sits. Through close collaboration with what can best be described as a 'stellar' project team, he and his colleagues developed a design solution that stands among the most unusual Wilder has ever seen for a residential project.

By Jim Wilder

Among the wonderful benefits of working in the custom watershaping business is that you never really know what sort of projects will wander into view.

Through the years, we at Living Water Creations of Santa Rosa, Calif., have certainly participated in developing and executing some unusual designs, but I can honestly say that working on one that included a huge, beautiful steel pyramid topped by a deep-space telescope was something that had yet to come our way.

And it would have stayed that way had I not received a call from John Anderson of Pools by Rapp, another firm here in Santa Rosa. We've collaborated on other projects in which our firm has built ponds or fountains to go along with pools and spas he's done. In this case, he was installing a lap pool and wanted our help in what he could only describe as an extremely unusual watershape.

The client was in the process of building a beautiful contemporary home and, as an astronomy buff, wanted to complete the package with an observatory he could call his own. The kicker: The observatory would be housed in a pyramid that was to "float" atop a big reflecting pool.

THE LAY OF THE LAND

The setting had been untouched before the owner purchased four acres of gently sloping land just outside Sonoma, Calif., near the heart of the state's legendary wine country. Gorgeous even in an area renowned for its sweeping, bucolic landscapes, the property includes a natural stream.

The amazing home ingeniously blends contemporary and Mediterranean elements using glass, concrete and Cor-Ten

steel. (Cor-Ten is a carbon steel that rusts just on the surface: The thin layer of rust protects the underlying steel from rusting as well.) The house features a cantilevered roof corner that called for use of #18 rebar (with a diameter of 2-1/8 inches) to support it. Around the home, the landscape architect had distributed 36 specimen olive trees that had been moved onto the site.

We were called in to design and install the equipment and containment system for an 80-by-60-foot, 16-inch-deep reflecting pool that was to surround a pyramid-shaped observatory at the top of which was to be mounted a dome for a telescope. The landscape design was developed by Andrea Cochran (Andrea Cochran Landscape Architecture, San Francisco), while STUDIOS architecture (San Francisco) took care of the pyramid/observatory structure, which measures 20 feet square at the base and rises up 35 feet.

The sides of the pyramid and the raised walls of the pool were both to be made with Cor-Ten steel to echo materials used

Once the raised steel wall of the pool was fully assembled into a solid (and very heavy) unit, we used I-beams, chains and jacks to lift it about six inches above its footing to allow for insertion of the liner.

in the house, the front of which offers views of this most unusual outbuilding. The water was also to interface on two sides of the pyramid with concrete walkways leading to the structure – and on the third side with a landing situated at the bottom of the staircase leading up to the observatory.

In our conversations with the client, he told us he wanted the reflecting pond to be as still as we could possibly make it – no moving water, no sound, just a beautiful, glassy, uninterrupted reflective surface that would capture the form of the pyramid. So our job was not only to figure out how to build the vessel to make it hold water, but also to have it recirculate without seeming to do so.

The main challenge, as we saw it, was sealing the liner where it met up with the Cor-Ten perimeter: The three-quarters-of-an-inch-thick wall panels, for example, are L-shaped with eight-inch footings, heights of 18 inches and outer dimensions of 80 by 60 feet. The big question: How could we weld together all the sections of this Cor-Ten perimeter without damaging the liner beneath them?

My first call for support was to my friends at New World Manufacturing (Cloverdale, Calif.): We have worked together on numerous koi ponds, retention ponds and various other water-features, and they recommended use of a Hyperlon liner because it is both extremely durable and most receptive to being seamed in the field.

COLLABORATIVE ARTISTRY

After much discussion, we decided to have the sections of perimeter welded together on their concrete footings before installing the liner. The bases of these steel sections were penetrated by stainless steel all-thread we'd imbedded in the concrete at one-foot intervals. Atop the concrete, we placed a six-inch-

With the walls back in place, we went through a reasonably straightforward (but laborious) process of piecing the rest of the liner system together. A heat-seaming unit took care of the bulk of the work, but a fair amount of detailing was also required to take care of various penetrations.

Once the liner was fully in place, we filled the basin with smooth stones and then water-tested the system. After we dealt with a few leaks that developed in the installation process, the system was ready to go.

wide ribbon of Cor-Ten, arranging things so the liner would be sandwiched between two perfectly flat surfaces.

Once all of the sections were in place and had been welded into a single, massive unit weighing approximately 15,000 pounds, we used a network of I-beams, chains and hydraulic jacks to raise the Cor-Ten structure six inches above the footings. To protect the liner, we put down a layer of filter cloth of the sort often used in French drains over the footing. We then draped five-foot-wide strips of the liner over the footing after carefully cutting holes for each anchor bolt.

Once all of this was in place and before the Cor-Ten structure was lowered back into place, we applied two beads of Bentonite-infused caulk atop the liner to receive the steel.

We had also placed pieces of the liner beyond where the concrete walkways and stairway supports were to go. Once the concrete had been poured and the forms stripped from these details, we applied a protective layer of filter cloth under the entire area and then were ready to start installing the rest of the lining – draping liner material across the floor of the reflecting pool, heat seaming as we went. Around the pyramid's base, we had to do a great deal of cutting and pasting, which was quite similar to what happens in installing linoleum floors in kitchens.

We lifted pieces of the liner up above the waterline around the pyramid and attached them to its base with bolts at one-foot intervals. The steel contractor then tucked finishing panels of Cor-Ten steel under the slanted wall overhang and over the liner, effectively hiding it from view. After installing our drain grates, we then partially filled the pool with water, looking for leaks.

As luck would have it, the steel contractor's labor in wrestling with the L-shaped flashing at the base of the pyramid ended up penetrating the liner in three places. We removed the flashing, repaired the leaks and everything was good to go.

SMOOTH FLOW

Backing up a bit, before we installed the liner system, we'd already dug trenches for the plumbing, which included six drains, eight floor returns and four skimmers (one in each corner of the pool). There was no way to create skimmer niches without thoroughly disrupting the appearance of the Cor-Ten wall structure, so we installed niche-free black skimmers that rose 14 inches from the floor. (At first we tried to paint them to match the color of the rusted steel, but that didn't work and we ended up leaving them black.)

All of the drains and returns were balanced hydraulically by plumbing them in pairs using tees. In turn, each of these pairs was plumbed to another set of tees outside the perimeter of the pool, where we installed three-way valves (Jandy, Vista, Calif.) that allowed us to fine-tune the flow to achieve perfect balance.

We fitted all drains and returns with anti-vortex lids (Pentair Water Pool & Spa, Sanford, N.C.) to eliminate any possibility of generating eddies that would disrupt the glassy surface of the

water. We also designed the plumbing system to operate at an extremely slow flow rate of four feet per second. When we finished, the only place where a slight surface movement could be detected was near the skimmers – but it was subtle enough that the owner was satisfied that we had met the goal of motionless flow he'd set for us.

The equipment pad is relatively simple and sits about 100 feet from the pool. We installed a Sta-Rite two-horsepower pump and a Sta-Rite System 3 cartridge filter along with a Rainbow Lifegard trichlor erosion feeder (all from Pentair Water Pool & Spa) to keep the water clear and polished. We also set up the timers so the system, with its six-hour turnover rate, would operate only at night.

From start to finish, this entire project was about teamwork. I only spoke directly with the client a few times, but there were innumerable meetings and conversations with other team members, mostly aimed at developing the best possible solutions to the sorts of challenges described above. In fact, that flow of information was so steady and intense that I cannot honestly say who was responsible for the various ideas we put into play.

The result of all of this collaborative effort is one of the most unusual watershapes any of us who worked on the project has ever seen. The reflecting pool and its pyramid create a spectacular composition in metal, stone and reflective water that is truly stunning – the perfect place, the client seems to agree, for a wondrous bit of stargazing.

The results of this painstaking installation process are nothing short of amazing: The pyramidal observatory itself is a work of art, and the stillness of the water at its base creates extraordinary reflections day and night.

National Wonders

As is true of many of his fellow watershape and landscape artists, Rick Driemeyer is also an avid explorer of nature. For years, in fact, he's made a practice of regularly visiting wilderness areas for both professional inspiration as well as pure enjoyment – a perfect pairing, as he sees it. To press that point here in a big way, he shares what he's encountered in hiking through four of the most spectacular national parks in the western United States.

By Rick Driemeyer

By now, the thought that watershape and landscape designers need to study nature if they want to replicate it in their projects is basically a cliché. Truly, if you want to mimic nature successfully, you must first know it intimately.

What many miss in all this, I believe, is a deeper level of "knowing" that goes well beyond simply *observing* nature as a source of techniques and ideas. Frankly, I think that as designers and as human beings, we are much better off when we also learn how to *become* nature – by which I mean letting the sights, sounds and smells draw us physically into the place.

In doing so, we engage in experiences so profound that the mere mentioning of that place will set us off with memories we will share enthusiastically – or can use as parts of our latest projects.

No matter how often I visit natural places, I'm always amazed at the interactions that take place among the basic elements of water, stone, soil, plants, sunlight and wind. I know I will never be able to comprehend all of the complexities and nuances that have gone into shaping what I'm seeing, but by witnessing these places and reveling in these experiences, I come away with a greater, more intuitive understanding of the dynamics of the natural world and have, I trust, better prepared myself to approximate its features in my own work.

In my case, I seek these experiences with regular visits to national parks. It's easy where I live in the western United States: Some of the most spectacular environments on the planet are being preserved here within easy driving distance. For years, I've seen these places as being among the most valuable assets we designers have – an *awesome* embarrassment of riches for anyone who values the natural world.

In this pictorial feature, I'll demonstrate what I mean by sharing my perspectives on just four of these magnificent places: Yosemite, Zion, Bryce Canyon and the Grand Canyon. Each in its own way, these parks offer any visitor treasure troves of beauty and inspiration. And for those of us who are also designers, they offer invaluable lessons in the ways water sculpts the land.

Yosemite

Established in 1890, Yosemite National Park covers more than 700,000 acres – about 1,000 square miles – in the mountains of east-central California. Famous for its biodiversity, trees, geology, abundant waterfalls and crystalline streams, its beauty has inspired artists for generations.

I've visited Yosemite regularly for more than 30 years now, starting when I first moved to California. Nowadays, I go there at least once a year, encouraged by the fact that there's always much more to see. Indeed, it's one of those places you could visit monthly (or even weekly) and still keep discovering new vistas.

Yosemite was formed by a glacier in the last Ice Age. It consists mainly of a massive U-shaped valley with cliffs soaring above forested slopes and the valley floor. When you first reach the core of the park, you're stunned by its sheer grandeur, even if you've prepared yourself by looking at photographs: You simply can't anticipate the scale and drama of the place until you see it firsthand. (The same is true of all four of these parks, so I'll make this point here once and for all.)

Everywhere you look, the scenery is defined by the presence of water. One of my all-time favorite Yosemite hikes is the Mist Trail, which follows the water pathway leading to the Vernal and Nevada falls. All along this trail, you see evidence of water's work: boulders cleaved by ice; gravel tumbled into shape by spring runoff; tree roots exposed by brisk flows; and fallen trees that have changed the course of the river. There are also small alcoves with moss growing on the granite roof from which small, perfect droplets of water that have traveled through the rock for years finally form and drip – a process I reproduced on a boulder in a teahouse project of mine.

The specific "lessons" to be taken away from a single hike of that sort could become an article many times the length of this discussion. Indeed, an examination of the forces of erosion alone would do that: how the water naturally breaks down the landscape, exposes parts of subsurface formations, creates various types of cascades, waterfalls, pools and streams and weaves together an infinite tapestry of sight and sound. If you also consider the juxtaposition of materials, colors and textures, the experience can readily be translated into designs of *all* types – not just the naturalistic ones.

I've been there when there were roaring torrents at every turn and then returned months later to find dry streambeds. Both extremes are useful: You can witness the aesthetic variations created simply by the volume and velocity of moving water – or you can study the stone structures that water creates and feel its presence even when it's not there.

Most visitors to the park are satisfied to be blown away by views from a distance, but I recommend getting right up close to examine the interactions of stone and plants, stone and water, water and plants and, occasionally, of all of them with the animals that live in the park. If there's any space on the planet that holds up under that sort of close scrutiny, it's Yosemite – quite simply one of the most spectacular places I've ever seen.

Zion

Set in southeastern Utah on the northeastern edge of the vast Mojave Desert, Zion National Park was established in 1909 largely to preserve the homeland of the Anasazi tribe of Native Americans. It's a relatively small national park at just 229 square miles, but that's enough to encompass Zion Canyon and the north fork of the Virgin River.

In terms of its influence on the art of watershape and landscape design, Zion may well be one of most dramatic examples of unfolding surprises that you'll ever see. To get there, you drive across seemingly interminable miles of flat grassland – a barren wasteland that is the antithesis of beautiful and remarkable. You then enter the park through an impressively long tunnel, emerging into the midst of an oasis defined by huge rock formations, evergreens, ferns and scores of different flowering plants.

Whatever Zion lacks in scale or pure grandeur, it makes up for with endless subtlety and constant revelation. As is the case with Yosemite, Zion is a complex study in stone, plants and water, but it draws added significance from a fascinating layering of visual features. In particular, Zion includes some of the most interesting erosion patterns I've ever seen anywhere.

One of the easiest hikes in the park leads you to a place known as Fern Grotto, which is completely hidden until you walk into it. This beautiful space includes sheer cliff faces through which water seeps to create a spectacular pond. As the name implies, the entire scene is defined by thick ferns that drape across the rocks as a natural hanging garden. When sunlight filters through the ferns, you experience visual explosions in vibrant, deeply soothing green.

The entire park is a treat, but this one enclave is a perfect example of how your emotions and perception of a greater space around you can be instantly transformed by entering a compact, comprehensible space where the sights and sounds of water and plants infuse the landscape with intensity, volume, scope and life. And there's much more, because Zion offers other surprising spaces at almost every turn

Knowing Destinations

In my visits to the four parks under discussion in the accompanying text (and countless others), the idea I've had most profoundly reinforced is that human beings are fundamentally at their happiest when they participate with nature.

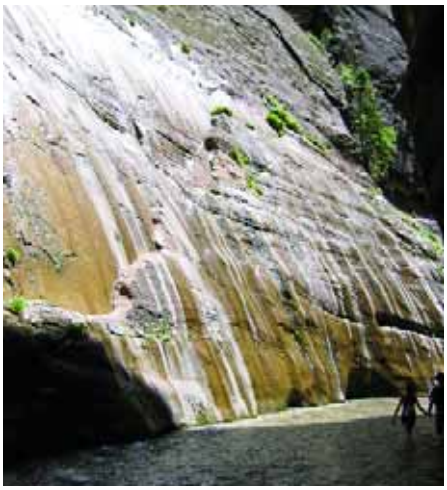
By extension, when we as watershapers and landscape designers set a scene small or large, we are creating places where people get involved with their surroundings – and that's true whether the scene is the most naturalistic or most architectural. We are in the business of creating spaces where people experience life: where they rest, where they exercise, where they break bread with friends and family, where they grow, where they grieve, where they pray, where they socialize, where they formulate ideas about their future and where they sometimes make love and maybe even die.

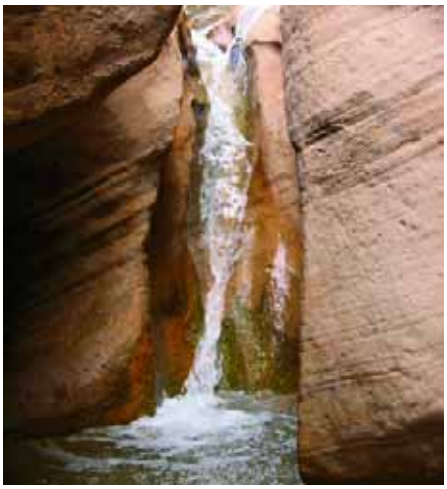
We create venues of human experience, and that's a huge responsibility. This is why we should all visit our national parks, because in these places, we see the most dramatic examples of "place" to be found anywhere and are also occasionally in position to see how other human beings respond to and interact with them.

Atop and maybe beyond all that high-mindedness, there's also the fact that exploring these parks is just plain fun. To me, these are absolutely the best places to vacation with loved ones and share experiences with them you'll all remember for the rest of your lives. These are, in short, wonderful places to rejuvenate your body, mind and spirit.

And if you come home with an idea or two that will come in handy the next time you sit down to design a space where people will spend part of their lives, well, so much the better!

– R.D.





Bryce Canyon

Bryce Canyon National Park is another treasure of southwestern Utah, and although it's just 50 miles from Zion, it might as well be on a different planet. Established in 1924, the park covers just the 56 square miles atop the Paunsaugant Plateau – and the star of the show is a sloping semi-circle defined by *hoodoos*, one of the most unusual rock formations found anywhere in the world.

With respect to direct design lessons to be learned in national parks, Bryce Canyon offers the least of any of the four parks covered by this discussion. In my estimation, however, it's just as worthy of a visit as the other three simply because it is so strange – and so uniquely beautiful.

Rising to 9,000 feet at its summit, the area is sparse in plant material beyond a few pine groves, and there isn't much open water to speak of. Instead, the key to Bryce Canyon is geology and the hoodoo formations carved there by water, wind and ice. Indeed, when you visit the park and catch a glimpse of the hoodoos for the first time, you feel as though you've stumbled upon a completely different world filled with towering rock spires and ridges that look like something an *avant garde* sculptor might create.

Beyond these fantastic, dominating forms, the careful observer begins to pick up on the colors of the stone: Layers of bold orange, bright yellow and brilliant white provide some of the most surprising vistas I've ever seen and have inspired me more than once to be more daring in working with colors in some of my designs.

As you hike through this landscape, your sense of being on an alien planet only intensifies. Some of the hoodoos reach heights of 200 feet, and their scale makes them both awe-inspiring and a bit eerie at times. And the amazing thing is that these formations were not carved by rivers or glaciers but were instead shaped by the steady sculpting power of rain, snow and wind.

In practical terms, visits here may be most rewarding to modern artists, simply because the forms are so dramatic and unusual. Speaking for myself as a watershape and landscape designer, however, I'm satisfied by the fact that the place is just incredibly cool.

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Before the next Elements of Construction school convenes, David Tisherman will lead an eight-hour, entry-level class in 'Basic Perspective Drawing.' This workshop will cover the essentials of one- and two-point perspective and introduce skills needed to communicate visually with clients, contractors and fellow designers. (Note: This class is a prerequisite for Larry Drasin's 'Design Communication – Measured Perspective,' a 20-hour course that will be offered at the IPSP Expo in Las Vegas in November 2009.

Fees: $799 ($699 if also attending The Elements of Construction); includes one hotel night and meals.

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The Grand Canyon

Last (but certainly not least) in this grand tour is Grand Canyon National Park. Established in northwest Arizona in 1908, the park covers an area of more than 1,900 square miles while stretching across 277 miles in length and reaching down a mile at its greatest depth.

As with Yosemite, the Grand Canyon owes its entire existence to water and stands among the world's most dramatic example of the power of water to carve the land. Words simply aren't adequate to describe its natural majesty: It is, in short, an undisputed wonder of the natural world.

There are three basic ways to experience the Grand Canyon: up on the rim, on the walls or down on the Colorado River. I've done all three and prize the fact that each experience is totally different.

For anyone involved in using water in their designs, I see the Grand Canyon as an absolutely essential destination – but I say the same to non-designers as well. If you have any interest at all in geology or natural science, the canyon is an open book ripe for study and ready to see and touch. And at the bottom of the canyon are exposed rocks that are among the oldest on the globe, dating back some four billion years to the Earth's infancy.

In every sense, the Grand Canyon is a study in extremes. On one of my trips, for example, it was snowing at the rim, which stood at a 7,000 foot elevation. I hiked down the canyon walls, and by the time I reached the base it was time for shorts and swimming before boarding the boat – a brisk, one-day experience of both alpine and desert climates.

One of my favorite all-time Grand Canyon hikes led me all the way up to the rim, where I saw tiny rivulets of water emerging from a massive rock formation. I followed along as this tiny flow coalesced and combined with other, unseen flows. As I worked my way down, I observed this force of nature cutting its path through the rock, creating deeper and wider slot canyons – showing where, through the ages, time and water had carved some of their most sensuously spectacular forms. And the light through these canyons is just awe-inspiring!

In exploring all of this, I was utterly amazed by the thought that, sources unseen, all of this water gathered into larger and larger flows until it reached a point where the trickles had amassed into a 25-foot-wide torrent pushing over a massive waterfall.

It's a place where you can see the most delicate flowering plants emerge from seemingly impenetrable rock faces; where you can relax and soak in the vast beauty or fully test your physical limits; or where you can experience nature on the grandest scale imaginable or study the tiniest aspects of a spectrum of ecosystems. You can absorb the grace of the most delicate tendrils of water and plant material – or dive from ancient rock formations into the bone-chilling waters of the river.

Again, the value of such visits and experiences isn't always in the design ideas you might take away from the park; rather, it's about what you can absorb of the spirit and essence of the places in seeing them with your own eyes and feeling the effects of these experiences to the core of your being. If absolutely nothing else, you'll walk away with a dramatically amplified appreciation of nature, its sublime delicacy and its raw power.

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Question: Are you optimistic that the current difficult economic situation will begin to turn around before the end of 2009?

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What year was the first swimming pool installed on an ocean liner?

a. 1899
b. 1907
c. 1919
d. 1931

Go to www.watershapes.com/extra to make your choice and find the correct answer.

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According to Guinness World Records, the largest swimming pool in the world is located in which country?

a. Brazil
b. United Arab Emirates
c. Chile
d. Australia

Go to www.watershapes.com/extra to make your choice and find the correct answer.

WATERSHAPES ONLINE

In the Spotlight

For live links to the companies featured here, go to **www.watershapes.com/spotlight**

UV Sterilizers

EMPEROR AQUATICS (Pottstown, PA) has introduced the SafeGuard line of ultraviolet sterilization devices. Made in both plastic and steel models to suit a variety of applications, each device features a corrosion-resistant, watertight power enclosure and is designed to deliver primary germicidal protection while meeting the regulatory and environmental challenges of the pond, swim and fountain markets.

Commercial Pump

PENTAIR WATER COMMERCIAL POOL & AQUATICS (Sanford, NC) has expanded the EQ Series of commercial pumps. Designed for commercial aquatic facilities and large, high-end residential pools, the line now includes a 10-horsepower, 230-volt, single-phase model – a high-performance, low-noise unit featuring closed impellers that guarantee a longer motor life even under the stress of higher loads.

Outdoor Lighting Fixture

KICHLER (Cleveland, OH) has added the Cathedral Collection to the list of styles in its extensive Garden Collections line. The new look includes seven coordinated, die-cast-aluminum lighting products finished in a textured-bronze powder coating. Each item features window-inspired crisscross patterns and citrine glass inserts for soft, wispy lighting designed to highlight plants as well as architecture.

Robotic Pool Cleaner

WATER TECH (East Brunswick, NJ) has introduced Blue Pearl, a commercial-grade, fully automatic, robotic swimming pool cleaner. Offering 2- to 3-hour cleaning cycles and featuring PVA climbing brushes to reach the toughest spots on pool walls, the device works with an external timer and comes with an automatic safety shut-off. It also has built-in air and optical sensors and works on just 24 volts.

Laser-Light System

BLISSLIGHTS (Escondido, CA) offers a full line of indoor and outdoor commercial and residential specialty laser light products. Designed to illuminate any water or garden space, the low-voltage, easy-installing, long-lasting, weather- and temperature-resistant units emit thousands of pinpoints of holographic laser lighting to create sparkling lighting effects that spread throughout any watershape or outdoor space.

Railing Systems

FEENEY (Oakland, CA) offers DesignRail aluminum railings. Made using recycled content and featuring lighter weights, state-of-the-art powder coatings, long usage cycles and attractive styles, the products are designed for durability, low maintenance and environmental integrity as well as quick on-site assembly using pre-engineered components that snap and screw together without any special finishing.

Salt Chlorinators

SALINE GENERATING SYSTEMS (Tempe, AZ) offers the SG Series of saltwater chlorinators. The simple-to-use, energy-efficient devices generate soft, silky-feeling water with no chlorine odor, red eyes or skin irritation and can be used with an array of control systems. They come in three models for pools of 30,000, 45,000 and 60,000 gallons and have a polarity-reversing electrode cycle to minimize cleaning.

Indoor Waterfalls

HARMONIC ENVIRONMENTS (Stuart, FL) has introduced the Bellaqua Series of indoor waterfalls. Designed for simplicity and low cost and engineered to standard specifications, the freestanding waterfeatures are designed for easy, turnkey integration into virtually any space, may be fully customized with finishes from the clients' existing materials library and can incorporate both lighting and graphics.

Retaining Walls

CARDINAL SYSTEMS (Schuylkill Haven, PA) has introduced a retaining-wall system with the look and durability of conventional block or concrete walls without the weight or difficult assembly. The wall panels simply bolt together using common hand tools, install quickly, require virtually no maintenance and can be used to create garden walls, planting beds, tree rings, raised patios, terraces and boundary walls.

Concrete Densifier/Hardener

W.R. MEADOWS (Hampshire, IL) has introduced Liqui-Hard Ultra Molecular Concrete Densifier & Chemical Hardener, a colorless, ready-to-use, easy-to-apply liquid that hardens and dustproofs concrete at a molecular level. With proper spray-on application, the product eliminates dusting and pitting and improves the durability of the surface while also increasing its abrasion and chemical resistance.

Equalizer-Line Covers

PARAMOUNT POOL & SPA SYSTEMS (Chandler, AZ) now offers an Equalizer version of its VGB-compliant SDX Retro High Flow Safety Drain. Designed for use on skimmer equalizer lines, the cover includes a spacer ring that allows for mounting without the need to chip away the finish and substrate of the pool wall to create a recess as well as anchors and screws to attach the cover to the pool wall.

Submersible Pumps

GRISWOLD PUMP CO. (Thomasville, GA) has introduced 4-, 6- and 8-inch Submersible Turbine Pumps for a variety of fountain and waterfeature applications. All made using heavy-duty, class 30 cast iron for maximum efficiency and abrasion resistance and featuring long-life bronze bearings, the high-flow devices also feature enclosed silicon-bronze impellers.

In the Spotlight

For live links to the companies featured here, go to **www.watershapes.com/spotlight**

Lighted Pool/Patio Furniture

POOL SHOT PRODUCTS (Ashtabula, OH) has introduced a line of waterproof furnishings that glow courtesy of LED lights installed within. The line includes chairs, cocktail tables, cubes, cylinders, polyballs and faux rocks – 18 items in all – each made from weather-and waterproof polyethylene designed with a recess for a battery-operated LED that shines upwards and outwards through each piece.

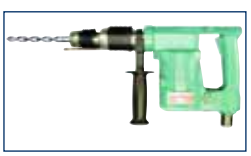
Quartz Pool Finish

MINERAL VISIONS (Chardon, OH) offers SpectraQuartz colored minerals for use in conjunction with plaster finishes. Made with 100% natural, permanently pigmented quartz, the additive is extremely hard, durable and chemical-resistant; comes in a huge array of standard colors and custom blends that won't bleed or fade; and can be used to create every look from a subtle shading to a bold statement.

Anti-Entrapment Cover

NEW WATER SOLUTIONS (Topton, NC) offers the Drainsafe DS360 drain cover. Designed as a replacement for all 6-1/2- and 8-1/2-inch round covers over 5- or 8-inch sumps, the anti-entrapment device comes with a universal fastener kit and security tool and works in both single- and dual-drain applications on floors or walls. Its dome structure also makes it friendly to pool cleaners and service brushes.

Rotary Hammer



CS UNITECH (Norwalk, CT) offers the Model 2 2404 0030 Pneumatic Rotary Hammer. Designed for safe use in wet environments, the lightweight device delivers 3,000 blows per minute, operates underwater and has an exhaust system that pipes air away from the tool, eliminating bubbles underwater and giving the diver a clear view of the work area. It can also be converted to straight rotary drilling at 625 rpm.

Block Retaining Walls

VERSA-LOK RETAINING WALL SYSTEMS (Oakdale, MN) offers the Mosaic option for use in building attractive retaining walls to the highest engineering standards. Made by combining three different modules (one from the company's Standard line, one from its Cobble line and two from its Accent line) into one new look, the randomly patterned system assembles easily as 10-by-24-inch panels.

Butterfly Valves

ASAHI/AMERICA (Malden, MA) now offers CPVC discs with its Type 57 Butterfly Valves. Offered with the 3-, 4-, 6- and 8-inch models, the new discs offer enhanced safety and performance in aggressive chemical environments compared to standard PVC discs. The valves' stem design isolates the valve body from the pipeline fluid, so the water contacts only the disc and the full-seat liner material.

Two-Speed Motors

A.O. SMITH (Tipp City, OH) has published literature on its line of two-speed motors for pool and spa applications. The four-page, full-color leaflet offers details on units designed to run quieter, cooler and longer while using less electricity and operating with greater efficiency, covering options for inground and aboveground pools and spas as well as compliance with California's Title 20 requirements.

Acoustical Panels

PINTA ACOUSTIC (Minneapolis, MN) has introduced the WhisperWave line of acoustical control products. Available as panels, baffles, ceiling clouds and awnings, the products can be suspended from the ceiling, mounted along a wall or used as an awning to provide exceptional acoustical control across all frequencies, making them ideal for use around indoor swimming pools and other large open areas.

In the Spotlight

For live links to the companies featured here, go to **www.watershapes.com/spotlight**

Step Lights

ORBIT/EVERGREEN (Los Angeles, CA) has added new models to its expanding series of 12- and 120-volt LED step lights. With more than 20 models in the line, these long-lasting, energy-efficient outdoor luminaires can be used in entryways and decks, outdoor walkways and garden patios and feature 18, 40, 42, 48 and 60 LED lamp arrays, various cover-plate options and a variety of materials and finishes.

Custom Gates

EVOLUTION FENCE CO. (Hauppauge, NY) has added custom gates to its line of fence products, including single- and double-arch gates made to fit any architectural need. Available to match various standard fence styles, the custom products can be up to 8 feet tall and up to 8 feet long, with every picket welded to every rail and every rail to every frame junction, and are also available with locking devices.

Wall-Forming System

FRANK WALL ENTERPRISES (Columbus, MS) has introduced an aluminum forming system for installation of poured-in-place concrete retaining walls within poolscapes. The system is modular, so builders can produce a range of geometric and freeform shapes, and the forms are stackable, allowing for higher pours and making them ideal for use for raised pool walls, waterfeatures and multi-level decks.

Skid-Steer/Track Loaders

BOBCAT (West Fargo, ND) has introduced its M-Series of skid-steer and compact track loaders. Designed for superior performance and durability, the devices feature greater power, increased operator comfort and improved visibility in six models ranging in rated operating capacities from 2,180 to 2,690 pounds. The hydraulics have also been upgraded to allow for efficient completion of more work.

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Book Notes

Seeking Inspiration

By Mike Farley

In looking back on my career, I see that the past 20 years have been marked by a number of points at which I altered what I was doing.

Sometimes I changed companies; other times I found a way of shifting my approach to my work or how I conducted my life. In looking back, I'm proud of the fact that every time I chose to go in a new direction, the changes I made resulted in dramatic improvements in my career and in my enjoyment of my work and, indeed, of my life in general.

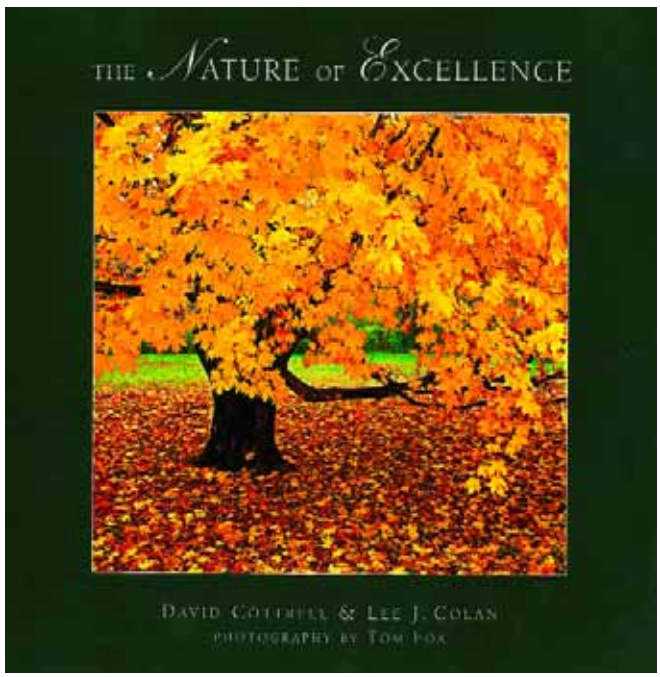
In other words, I've learned that, when approached the right way, change offers us an opportunity to advance our own causes in business and in life. Yes, it can be scary in that it typically involves risk, presents short-term challenges or difficulties and can require patience, nerve and courage. I've learned that to make these adjustments effectively, one must also have self-confidence and humility.

In all but a couple of instances, I can't help noticing that the changes I made were attended by tough economic conditions such as those we're experiencing right now: You don't have to be a psychologist to recognize that when our livelihoods are threatened, we are more likely to consider changing what we do or how we do it than we are when times are good and the living is easy.

These days, I know a number of people in the watershaping industry who are caught in the midst of these sorts of passages. I also know some good people who have left the business altogether and many other talented professionals who are considering career changes as well.

At the same time, I know many people who, despite the economy, are experiencing tremendous success. Almost to a person, these are watershapers who stand atop the profession, the kind who write of their projects in this magazine, work at the highest level and are happy to share what they know with others. They have carved out markets among similarly successful clients who have weathered the storms – and I'm certain that, if asked, all would say that, in the histories of their own careers, they've come to turning points where they made key adjustments and set new courses.

All of this leads me to the book I want to offer you this month: *The Nature of Excellence* by David Cottrell and Lee J. Colan with photography by Tom Fox (Cornerstone Leadership Institute, 2008). It's a compact, 88-page book about just the sort of inspiration we all need in times of tumult, stress and change.



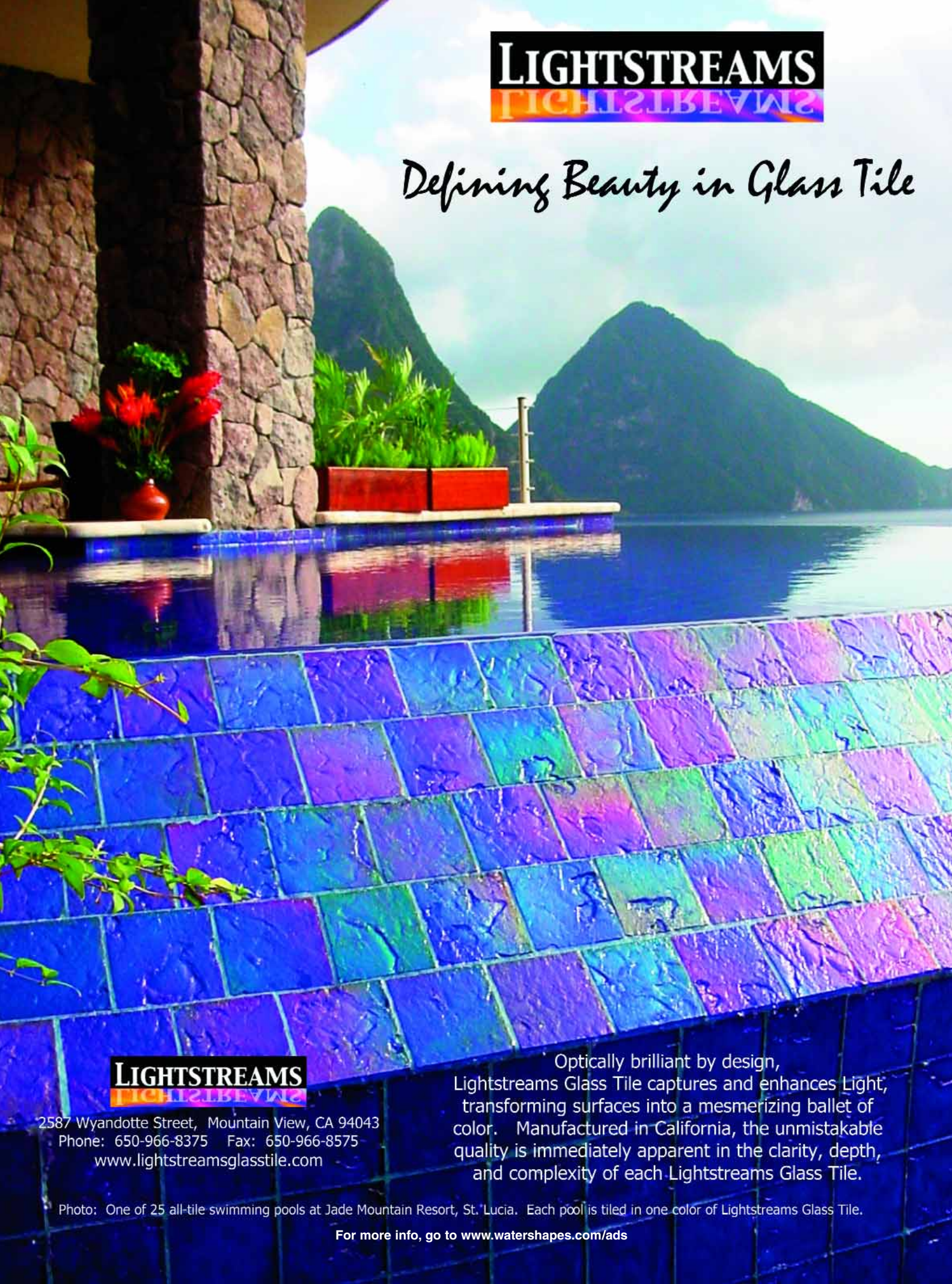
Each page features a beautiful picture of a natural scene accompanied by an inspirational quote, mostly by famous people. Many of these are comments we've heard before, but in this case organization is the key: The book is broken into three sections covering values of excellence, visions of excellence and acts of excellence, and each of those is further arranged into six related subtopics – every one of them illuminating a basic idea for the reader to consider.

The photography here is as beautiful as any I've ever seen – truly stunning – and the selected quotes are always potent, genuinely inspiring and distinctively thought-provoking. In fact, even the most cynical among us would be surprised by how affecting these beautifully conceived pages are, with a roster of commentators including such diverse characters as Bill Cosby, Winston Churchill, Norman Vincent Peale, Margaret Mead and Vince Lombardi (among many others).

One of my favorites is attributed to the recently departed and much-missed George Carlin: "Life is not measured by the breaths we take, but by the moments that take our breath away." One way or another, we all can use just that sort of audacious insight to nourish our idealism, stoke our optimism, fuel our creativity and bolster our sense of purpose.

My hunch: Wherever you are these days, you might just find some big time encouragement along those lines in the pages of this little book. WS

Mike Farley is a landscape architect with more than 20 years of experience and is currently a designer/project manager for Claffey Pools in Southlake, Texas. A graduate of Genesis 3's Level I Design School, he holds a degree in landscape architecture from Texas Tech University and has worked as a watershaper in both California and Texas.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