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WaterShapes

Design • Engineering • Construction

Volume 10
Number 11
November 2008
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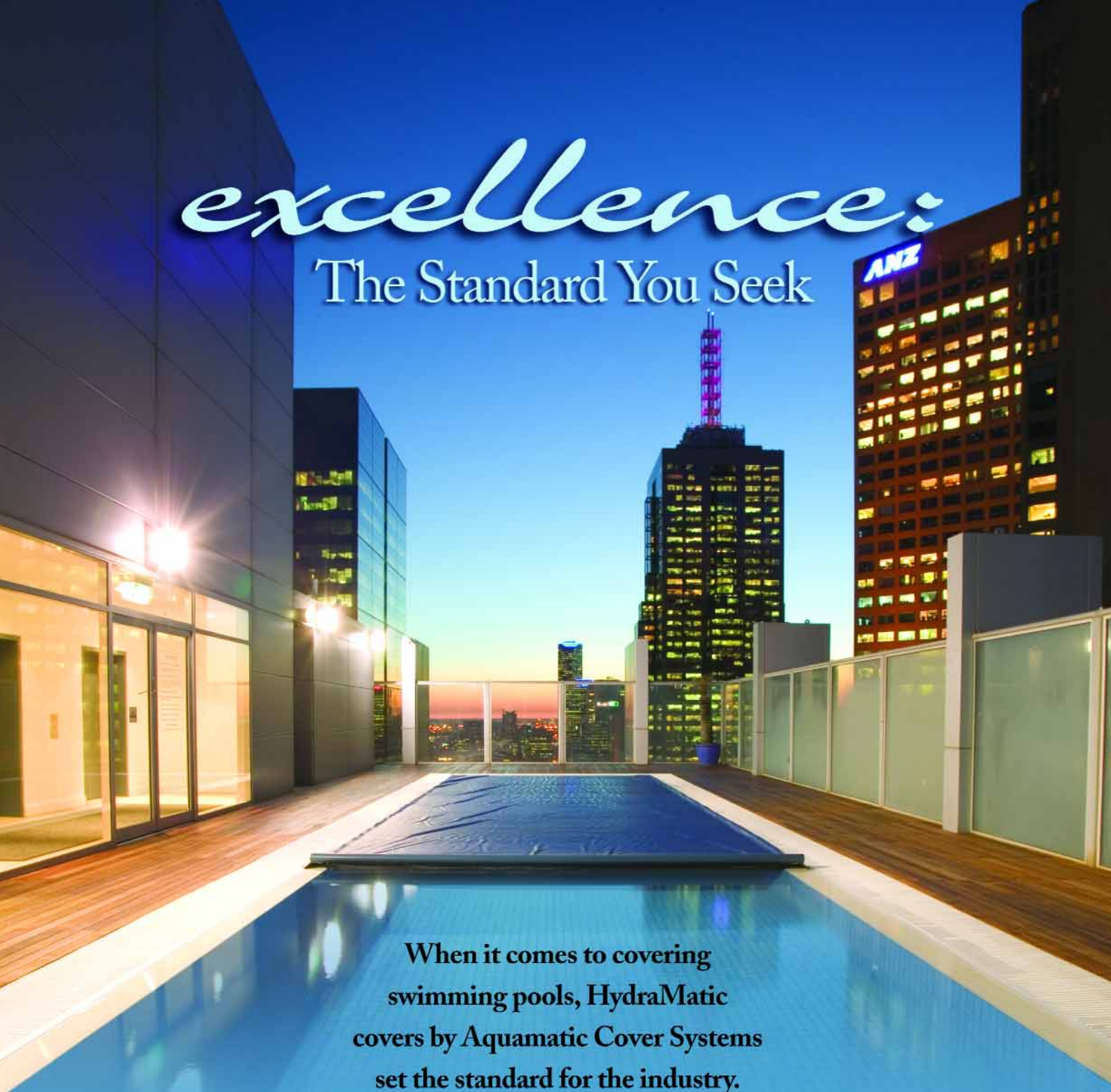

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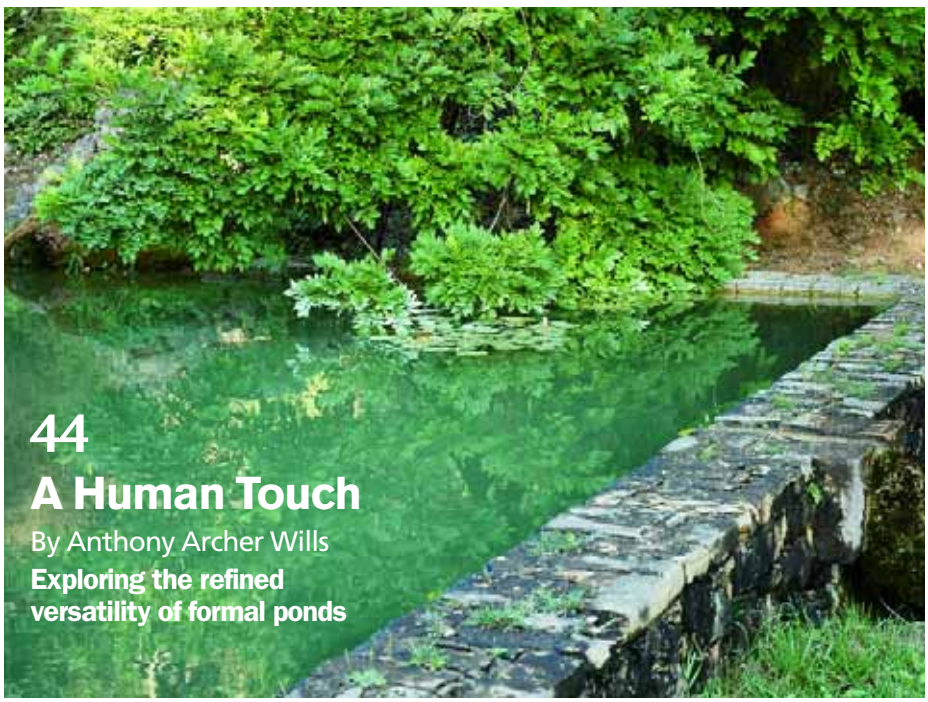

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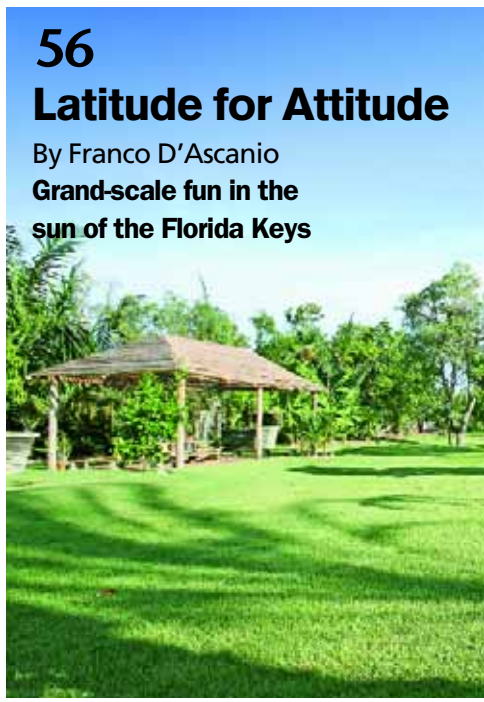

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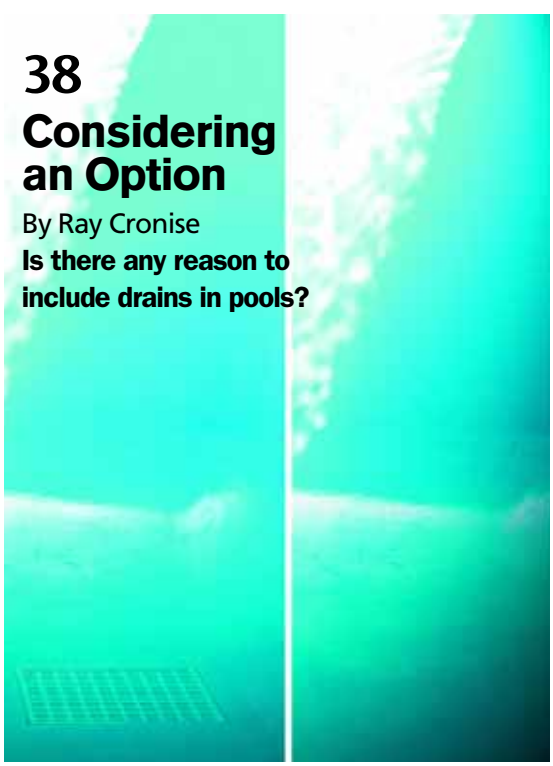

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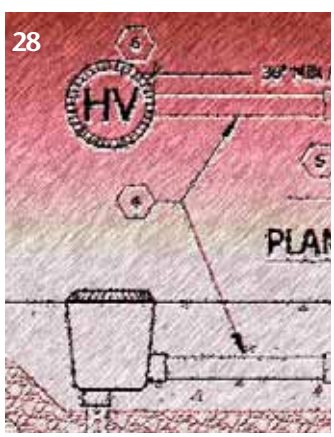

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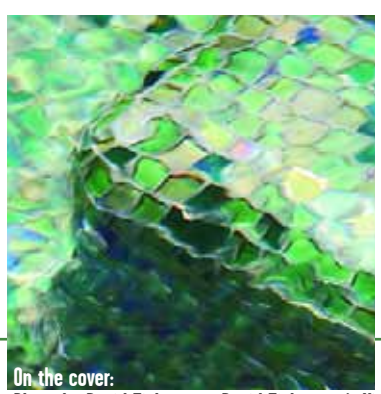

Photo by David Tisherman, David Tisherman's Visuals, Manhattan Beach, Calif.

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By Eric Herman

Digging the Scene

It's common knowledge that getting into any body of water – large, small, natural, man-made – involves a certain level of risk. Despite all the healthful benefits of water recreation, despite all of the immense psychological and even spiritual appeal of even being in water's presence, the brutal truth is that, in certain conditions, simply entering the water can also be hazardous.

For many years now, all levels of the pool/spa industry as well a variety of regulatory, code and standard-writing agencies have collectively and diligently worked at understanding and reducing these hazards, doing all they can to wipe away risks that lead to child drownings, diving accidents, stray-current electrocutions and the subject of this column and two longer pieces in this issue – that is, *suction entrapments*.

In recent months, the issue of suction entrapment has become an unusually hot topic as a result of the federal Virginia Graeme Baker Pool & Spa Safety Act as well as enhanced standards published by combinations of groups including the American Society of Mechanical Engineers, the American National Standards Institute and the Association of Pool and Spa Professionals. Other organizations such as the U.S. Consumer Product Safety Commission and the National Swimming Pool Foundation have weighed in as well with anti-entrapment recommendations of their own.

But nothing has drawn as much attention among watershape designers and builders as the arrest in July of a Connecticut pool builder who has been charged with second-degree manslaughter for allegedly creating conditions in a swimming pool that resulted in the entrapment-related death of a small child.

Even without these relatively recent developments, it's long been understood that, although suction-entrapment accidents are rare, statistically speaking, by comparison to aquatic accidents associated with boating, surfing, diving and the unsupervised immersion of small children, the details of entrapment stories are often horrific and involve either serious injuries or, in too many cases, the death of the entrapped person.

Simply put, there is no acceptable level of risk when it comes to suction entrapment. Even a single death is one too many.

This is the context in which the current issue of *WaterShapes* carries two stories – one a "Currents" column by engineer Dave Peterson beginning on page 28 and the other a Commentary by pool manufacturer Ray Cronise starting on page 38 – that explore this topic in great detail. Peterson, who has conducted many safety reviews for commercial pool facilities in light of recent events, microscopically reviews the standards and regulations that attempt to address entrapment and defines the practicalities of compliance. Cronise, a former NASA scientist, offers a big-picture, macro view of the situation and, with the support of some sophisticated computer modeling, offers the provocative suggestion that most pools would get along just fine without drains, thereby greatly reducing the risk of entrapment.

I'm no expert on this subject despite nearly 20 years of following the issue as a representative of the trade press, so I'll leave it to Peterson and Cronise to make their observations and arguments. But like everyone who's ever considered the issue of suction entrapment (and as the parent of two children who spent much of their young lives in swimming pools), I cannot and will not relinquish the hope that this is one category of accidents that can and *will* be prevented.

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November's Writers

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Anthony Archer Wills is a landscape artist, master watergardener and author based in Copake Falls, N.Y. Growing up close to a lake on his parents' farm in southern England, he was raised with a deep appreciation for water and nature – a respect he developed further at Summerfield's School, a campus abundant in springs, streams and ponds. He began his own aquatic nursery and pond-construction business in the early 1960s, work that resulted in the development of new approaches to the construction of ponds and streams using concrete and flexible liners. The Agricultural Training Board and British Association of Landscape Industries subsequently invited him to train landscape companies in techniques that are now included in textbooks and used throughout the world. Archer Wills tackles projects worldwide and has taught regularly at Chelsea Physic Garden, Inchbald School of Design, Plumpton

College and Kew Gardens. He has also lectured at the New York Botanical Garden and at the universities of Miami, Cambridge, York and Durham as well as for the Association of Professional Landscape Designers and the Philosophical Society. He is a 2008 recipient of The Joseph McCloskey Prize for Outstanding Achievement in the Art & Craft of Watershaping.

Franco D'Ascanio is co-owner and operator of D'Asign Source, a diversified family-owned and -operated firm in Marathon, Fla., that engages in home design and construction, interior design, landscape architecture and construction, watershaping, nursery and stone-supply services and audio/visual system design and installation. He runs the company, which was established by his parents in 1960, with his brothers Anthony (in charge of construction) and Amedeo (who handles the architectural department). At first, the company's range was limited to the stone-supply operation, but before long it moved into residential design and construction mostly for upscale clients in the Florida Keys. Among the company's many claims to fame, it boasts a nursery with one of the most comprehensive selection of palm species in the United States.

David Tisherman is the principal in two design/construction firms: David Tisherman's Visuals in Manhattan Beach, Calif., and Liquid Assets of Cherry Hill, N.J. A designer and builder of custom, high-end swimming pools since 1979, he is widely known in the pool and spa industry as an advocate for the highest possible standards of design, engineering and construction. He has degrees and credentials in industrial design, scientific illustration and architectural drawing from Harvard University and Art Center College of Design and has taught architectural rendering and presentation at UCLA. An award-winning designer, he serves as an industry expert for California's Contractor State License Board. Tisherman is a co-founder of and principal instructor for the Genesis 3 Design Group and was also a 2008 recipient of The Joseph McCloskey Prize for Outstanding Achievement in the Art & Craft of Watershaping.

By Brian Van Bower

Nature's Way

Naturalistic watershapes are exciting because of the way they enable me to expand my creative horizons. In a growing number of our projects, we're using ponds and streams in addition to pools, spas and fountains.

Ten years ago, back when *WaterShapes* was in its infancy, the idea that swimming pools and spas had much in common with other forms of contained water (including ponds, fountains and streams) was a true novelty: All of those worlds seemed light years apart.

In this past decade, however, things have changed and there's now widespread recognition that these seemingly disparate aquatic categories do indeed share many important characteristics and challenges. All of these systems contain water, for example, and circulate it in such ways that it stays safely clear and clean. All can be beautiful as well, whether they bring us stillness or motion, sounds or silence, energy or tranquility.

Coming at this from the pool/spa side of the equation, I'm fascinated by the opportunities I now have to translate my fundamental capabilities as a watershaper into other categories within the greater watershaping milieu. In particular, I've developed a powerful appreciation for the artistry involved in creating watershapes that are meant to look *natural* – an interest that has made me aware that the basic similarities we can now see across all lines of watershaping are balanced by tremendous differences as well.

a chance to grow

It's important, of course, for each of us to recognize that when we reach across lines, expand our repertoires and start using water in new ways, new doors open and we're able to increase and enhance what we offer our clients.

That kind of expansion is important when times are good (as they were as recently as two years ago) and when things become tight (as they are now). In my own business, for example, encompassing naturalistic watershapes has given me an entirely new way to talk to clients about water and enables me to place water in settings that would not have been workable for me in the years when I focused solely on pools and spas.

This broader focus truly has opened things up for me: Naturalistic watershapes can be of almost any size and can fit in a startling range of physical locations. They can appear in tiny spaces where they bring delicate sights and sounds of moving water to an intimate level. Or they can be expansive, transforming large areas into oases through which people walk and explore aquatic elements ranging from large waterfalls and islands to shorelines teeming with plants and fish.

Moreover, working with ponds and streams gives me occasional relief from having to deal with the codes and regulations that limit what can be done with pools and spas. Whereas every square inch of a swimming pool in a commercial setting in this country falls under the purview of building and health departments, ponds and streams are subject to significantly less scrutiny, with fewer restrictions on setbacks, depths, signage, pathways and just about every other design detail.

Also, because naturalistic watershapes are generally not built of reinforced concrete and are more often made using liners covered in stone and plant material, in many cases (but certainly not all), they tend to be not quite as costly as pools or spas and can be included without putting too large a dent in a budget.

But mostly, naturalistic watershapes are exciting because of the way they enable me to expand my creative horizons. In a growing num-

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ber of our projects, for example, we're using ponds and streams *in addition to* pools, spas and fountains to broaden the overall presence of water on given sites. Streams in particular are useful in connecting different areas, while ponds bring nature and restfulness into spaces otherwise dominated by man-made structures.

As is true with any new endeavor, digging into naturalistic watershapes involves learning what makes them tick. In the same way a watershaper from the pond and stream world has a steep learning curve in successfully embracing pools and spas, those of us from the pool/spa industry must explore these systems in a disciplined way and do what it takes to gain proficiency and achieve excellence.

a new view

My first exposure to ponds and streams came during a Genesis 3 program some years back in which master watergardener (and regular *WaterShapes* contributor) Anthony Archer Wills was leading a seminar. I was amazed by the depth of his discussions of stone selection and placement and the nuances he defined for effectively using stone in creating waterfalls, edge treatments and subsurface structures.

Although I'd built a number of lagoon-style pools and already had an appreciation of the art and craft of stonework, I was completely transfixed by the way he looked at stone relative to scale, how he considered its placement along edges and the techniques he described for moving large pieces into place in ways that the material would secure itself with gravity alone.

As he spoke, it occurred to me that this type of design and construction was *not* something you could draw up on a plan the way you would a coping or step detail: This was something that largely had to be done in the field, and he helped me see that stonework in ponds and streams is a purely improvisational art form.

I also recognized the way he uses stone on edges as a complete departure from the way we structure boundaries in pools and spas and line materials up to precise fractions of inches to create a crisp architectural presence. I suspect this rigid approach is why so many pool designers and builders who seek a natural touch instead fall prey to the dreaded "string of pearls" look – an alignment of stones that completely destroys any sort of natural appearance.

By contrast, artists including Archer Wills use stone in the water, on the margins and in the landscape so that the eye cannot detect the precise boundary between wet and dry. In some respects, it's the procedural antithesis of what most pool and spa designers builders do.

In reading his books and attending subsequent seminars, I came to appreciate the way Archer Wills uses liners, spreading them far beyond the water's edge atop earthen contours and then covering them with soil to create various shelves, gentle shorelines, planting pockets, peninsulas – all intended to integrate the water and the surrounding landscape.

He also taught me just about all I know

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when it comes to using plants in and around water to create natural-looking habitats and how the processes of nature can be used to create clear water without resorting to the treatments used in pools and spas. I learned as well the importance of concealing the source of a stream so that its headwaters emerge naturally from the landscape instead of becoming a visual distraction.

Through all of these revelations, I gained an appreciation for what makes ponds and streams effective in the landscape and awareness of the pitfalls that mark the works of lesser watergardeners. Just as I've always seen pools and spas that make me cringe, from time to time I now discern attempts at naturalism that are complete failures – even in large and apparently expensive installations.

In that respect, pools, spas, ponds and streams have one very big thing in common: They can all be used to great effect to transform a space into a paradise, or they can destroy an area with a thoughtless lack of craftmanship and design skill.

into the green

Another recognition that has come with my interest in naturalistic watershaping is the universal need for continuing education.

This means, of course, seeking out and attending courses taught by people such as Anthony Archer Wills and David Duensing (another superlative craftsperson). But just as I see a need with pools and spas of understanding history and appreciating the legacy of Greek, Roman, Islamic and Renaissance designers, I also see a need in the realm of ponds and streams to get out into *nature's* classroom and study the way water works its ways through the wild.

In the past few years, wherever and whenever I have the opportunity in traveling, I find my way into a park, nature preserve or wilderness area to see how water works in natural settings. I've taken many trips to North Carolina, for example, and I've made it my business to spend long periods of time walking along and photographing natural streams, waterfalls, ponds and lakes. This activity is something that all accomplished pond and stream specialists do, and I appreciate these hikes most for the way they help me see the incredible variety of approaches I can take in conceiving my own designs.

Most of us *assume* we know how nature does things, but in fact, until you open your eyes to the endless variations, random patterns and underlying order of nature, you can never truly embrace it to the point where you can begin to replicate it with any visual credibility.

Returning to Archer Wills for a moment, his study of nature leads him to use enormous boulders he buries partly in the ground so that they appear to be parts of immense subsurface structures, then often marks them with very small rivulets of water – just the sort of contrast of grand and small you often see in nature if you take the time to look.

In pool and spa work, we seldom hide material that way or devise flows of water that are deliberately out of scale in ar-

chitectural terms. But nature doesn't follow our rules and much of what we see in the wild is counterintuitive. With pools, for example, I can't think of a situation where I'd deliberately lay a fallen log over a body of water (someone might climb on it, so it would raise safety issues), but in stream construction, mimicking the natural occasion of a tree dying and falling is not only acceptable, it's *desirable*.

On all sides of the pool/pond/fountain continuum, we are, of course, still considering man-made bodies of water and we all need to understand hydraulics, the dynamics of flowing water and the principles of drainage, filtration and water treatment. System layout is different across those disciplines, as are approaches to filtration, water treatment and construction, but in every case the water needs to be placed under control, no matter whether the watershape is a pool, pond, waterfall, fountain, spa or stream.

In other words, as a designer of pools and spas, I saw working with ponds and streams as creatively liberating – until I recognized that every watershape, no matter its form, is very much constrained by the realities of engineering, physics and technology: They seem to be quite different, but at root they're very much the same.

rustic transitions

To conclude these ruminations, let me briefly describe a current project that captures the spirit of this discussion. We're designing a private resort property on the Pacific coast of Nicaragua for an American couple. The site runs along a gently sloping ravine that rises from a point some 15 feet above the beach.

The main building is an open-air affair that sits at the top of the slope. At that level, we'll install a large vanishing-edge pool with a formality and lines that match the modernity of the architecture and exploit the dramatic ocean views. Approximately 300 feet down the slope, we're building another large, freeform pool on a level right above the beach.

Between those two watershapes, we're inserting a substantial stream/waterfall/pond complex that will link the two areas. On either side of this composition will be a series of *casitas*, each with a patio overlooking the water and access to pathways that lead up and down through the space, crossing the stream at several points and providing small seating areas – a couple of which will be located on islands within the ponds. It's the perfect way to let visitors enjoy the sights and sounds of our handiwork along with fantastic views of the ocean.

The upper part of the stream will appear as through it's fed by the water flowing over the vanishing edge, but that won't be the case. Instead, the collection trough, which will be finished in natural stone, will house a hidden welling pond that will feed the upper portion of the stream and a sequence of cascades and ponds. At the base of the system, the water will run through a set of large bead filters to be

concealed behind an adjacent building.

We'll use indigenous stone and enlist the services of either local or United States-based stone artists well-versed in the art of placement to create the most natural and complex edges and vertical transitions possible. At various points along the watercourse, we'll add water from hidden locations so that the stream will gain in volume as it descends toward the lower swimming pool.

Along the way, we've planned for numerous planting pockets and shelves for rocks around the edges and will be spreading stone through the water and into the surrounding space to integrate the stream completely with its environment. I can't wait to see the finished product: It's going to be *beautiful*.

I am well aware that if I had not spent recent years educating myself about ponds and streams, this sort of composition would have been completely beyond my reach and I can reliably assert that I probably would either have developed another design solution or never have been seriously considered for the project. What we had here was an opportunity to create a wonderful linkage between two swimming pools, and my suspicion is that this naturalistic watershape will be one of the most memorable and enjoyable features of the property.

crossing lines

Certainly, there will always be those who will be most comfortable staying in one corner or another of the watershaping world, and I must say that I *do* see the merit of mastering one system type and doing it well rather than spreading yourself thin and achieving little more than working poorly in more than one medium.

But if you apply yourself, learn the ropes, pay attention and familiarize yourself with the ins and outs of watershape types that were previously unfamiliar, my own endeavors testify to the fact that you can expand your working horizons and open the way to ever-greater levels of creativity.

At a minimum, it is useful to open yourself to opportunity and align yourself with people who are experts in fields you don't want to pursue so you can bring them in when they can do things you can't. In my case, for example, if I didn't feel comfortable in my own capabilities, I'd be satisfied in having learned to communicate with skilled professionals in those fields, recognize possibilities and know where to find gifted people who have the necessary level of expertise – all to benefit my clients and help me exploit the broadest limits of watershaping's potential.

As with most everything else in life, it's about being open to the possibilities. 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.

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By Bruce Zaretsky

Decked Out

Decking material seldom takes center stage in a design, but its high visibility tends to make it more than just a bit player. The choice of a material can either bring an entire scene together or it can compromise its durability or aesthetics – or both.

Last month, I introduced my rundown on books I like to have at hand in my studio by mentioning a project that included a pool, an outdoor kitchen, stone walls, a fire pit and some other amenities. A feature I didn't mention – but one that may well be unique for a backyard in upstate New York – was the Peruvian Travertine we chose for use around the pool.

While decking material seldom takes center stage in a design, its high visibility tends to make it more than just a bit player. Indeed, the choice of a material can either bring an entire scene together by lending it a sense of comfort and interest, or it can take an otherwise functional and beautiful design and compromise its durability or aesthetics – or both.

As with most other landscape, hardscape and watershape choices, of course, the budget, clients' desires, prevailing climatic conditions, color palettes and geology all influence the selection process – but even those constraints leave us with a broad range of decking choices these days. Some are standard and relatively common, but others are exotic and can become particular points of visual interest and even pride.

The key? Knowing your options and the materials' performance characteristics while thinking about how your clients intend to use the space.

hot and cold

The project that spurred this line of thought was among those that called for a beautiful deck to complement other stylish elements.

It took us months to make the final determination to go with the aforementioned Peruvian Travertine – a risky proposition given the weather extremes we endure in our area, but one we decided was worth taking because the absolute beauty of the product made it perfect for the setting and irresistible for the clients.

Truth be told, the climate around here is not quite as extreme as the occasional winter headlines would lead anyone to believe, but we *do* experience significant swings in temperature and weather in the course of a year, with summers reaching into the mid-90s on many occasions and winters sinking below freezing for long stretches.

Those seasonal changes can be a bear to endure, but they're not what directly wreaks havoc on our work: What gets us is the constant freeze/thaw cycling, with temperatures climbing above freezing during the day turning anything exposed to moisture into something of a sponge. When this moisture freezes as temperatures drop again at night, expansion can break apart the host material.

Knowing the porosity of most types of Travertine and not wanting to use the material only to watch it fall apart in years to come, I put this specific stone through a battery of tests, soaking it in water daily and putting it in my freezer overnight over the course of a few weeks. I also gathered information from the supplier about this particular stone's absorption coefficient and its compressive strength – factors that are of utmost importance in choosing a product that will be exposed to our environmental extremes.

Continued on page 20


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I saw this process of running the material through all of this testing as simple due diligence: So far as I knew, I was to be the first to use this Travertine outdoors in my area, and I wanted to be able to give my clients the assurance that it would all be worth it. After an exhaustive process, we decided to move forward – and the results are truly beautiful.

This is part of what a designer has to do in this or any other area to find new materials – products that not only get clients excited, but have the capability of doing so for the long haul. Whether you work in upstate New York or the desert Southwest or subtropical Florida, it pays to know your materials and choose them wisely.

That in mind, let's run through a list of possible decking materials and point out some of the factors you should consider in determining whether those you're considering are truly suitable for the job at hand.

Before we get to it, however, please consider one last point: In a watershaping context, it's important to know not only how a material will perform over the long haul as a surface for a deck or patio or entryway, but also how it will stand up to the challenge of being consistently exposed to pool water and the salts and chemicals that come with it.

a surfacing registry

Now let's run through a list of possibilities, from artificial to natural:

Concrete: Relatively inexpensive and formable (and, in many cases, the only option considered), concrete has long been the most common paving material used around pools and for hardscape treatments.

Designers on the west coast have used this material to make aesthetic statements for decades (think Thomas Church and John Lautner, for example), but most of what I've seen in the east and in most other parts of the country is more utilitarian, probably because of the prevailing "that's what we've always done" mindset. To this day, in fact, most installers see a three-foot apron of concrete around pools as the standard – which may be true of vinyl-liner pools if what their installers tell me is correct and the concrete ribbon is essential to the pool's integrity.

That structural issue is fodder for another discussion, but once you get past that (literally) narrow perspective on concrete decking, it's my observation that it's an amazing material that, properly laid out and installed, can be a visual marvel.

Of course, the notion of proper layout and installation can be a stumbling block, and we don't seem to be entirely past a time when we run into concrete surfaces spider-webbed with cracks or stamped in brick or stone patterns broken awkwardly by control joints – but the situation seems to be improving.

It takes some effort, but I'll often have my mason cut control joints to follow a natural line in a stamped pattern – thus creating the look of two stones set next to

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Concrete

each other, for example. Or we'll used tan-colored aggregate to mimic the look of a sandy beach. We also exploit the possibilities of acid-staining, tile effects and slip-resistant finishes and are finding concrete to be more and more viable and valuable not only around pools but throughout our landscapes.

The key to using concrete is to establish an absolutely solid base and use lots and lots of reinforcement. After all, the worst thing that can happen to a beautiful concrete surface is to have it crack where you don't want it to do so.

Concrete pavers: Perfectly suited to northern climates because of their ability to take a tremendous beating, concrete pavers have come a long way since their inception. Also known as *interlocking pavers*, the originals were shaped like keyholes or I-beams so that they would literally lock into one another, providing a solid, unmoving surface. Nowadays, of course, they come in many forms and can


Concrete Pavers

be obtained as products that resemble brick, stone or tile.

The single biggest advantage of using these interlocking units is the fact that they can be removed for subsurface repair work or if they settle out of level. Thus, if you have a plumbing or lighting problem with a pool, you can simply pull up the decking, do the repairs and reset the pavers with far less effort than would be involved in jack-hammering away concrete or ripping up set stone or tile.

Another advantage of precast pavers is the fact that it doesn't take much to learn how to install them properly. Most employees can be trained to do so in as little as a day, and even if they make a few mistakes, all you need to do is lift and reset the offending units. I have to say I haven't been using them much in recent years, but I still call on them for the occasional driveway – and they even work well around pools because their surfaces not only look good but offer excellent traction even when wet.

Brick: Brick can work beautifully around pools, but there are a couple of reasons to consider this option with some care. For one thing, bricks can get very hot. For another, many bricks have relatively smooth surfaces and can be very slippery, especially when wet.

To get around that second issue, many manufacturers (including Belden Brick Co. of Canton, Ohio) make a sand-molded brick that has a rougher surface and the further advantage (depending on the project) of looking like it's a hundred years old right after installation. But others, including the wire-cut bricks made by Pine Hall Brick of Winston-Salem, N.C., are smooth and may not be advisable around a pool.

Installation methods will vary, depending on where you work. In the southwest, for example, brick can be laid and mortared on a concrete slab. By contrast, in the northeast the same bricks will be laid on a bed of sand. (As with concrete pavers, this can be an advantage if repairs become necessary.)

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To simplify installation, I suggest using bricks that are a true 2:1 (or 3:1) length-to-width ratio so there will be no gaps when you lay them out in herringbone or basket-weave patterns. If the brick supplier you've chosen isn't consistent in dimensioning the product, you'll inevitably have to deal with gaps that can compromise the visual pattern's appeal.

Stone: Until fairly recently, Bluestone was fairly uncommon, even "exotic" beyond the northeast, but now it is regularly shipped to distributors in other places and has a distinct appeal to clients there who want something unique. Where I work, however, Bluestone is quite familiar and I've done countless installations using it as well as Flagstone. Indeed, these are without question my favorite products for lots of applications.

I've used both around pools, but I do so only with due consideration. For one thing, both Flagstone and Bluestone are sedimentary sandstones that come out of

the ground as sheets with relatively smooth surfaces that become quite slippery, particularly when wet. For another, Flagstone tends to come with imperfections – intense color veins, rust streaks, mineral deposits and more – that might not be ideal if your clients are after consistent appearances. (On the flip side, that varied appearance can make individual pieces of Flagstone into works of art that will highlight any project.)

In addition, heat can be an issue with Bluestone and the darker Flagstones. The dark colors absorb the sun's heat and can make them literally unpassable by bare feet, which is one of the reasons I rarely place them around pools.

Flagstone presents another issue: The material is typically shipped in random-sized sheets called "broken Flagstone," and the edges of those sheets can be razor-sharp. Years ago, I tried my utmost to talk one set of clients out of using broken Flagstone around their new pool. They insisted, so one of my foremen spent two *very* full days hitting every edge with a four-inch hand grinder for an expanse of more than 1,300 square feet of deck.

To be absolutely certain there would be only minimal opportunities for problems, we also planted hundreds of creeping plants (including thyme and sedum) in the joints. Today, the site is a beautiful vignette of stone, water and plants – but it took lots of doing to make it so with safety.

Travertine: This spectacular material comes in many incarnations and a seemingly endless array of subtle colors. Although my direct experience is limited to the Peruvian product mentioned above, now that I've used it on two projects and have had the chance to observe its performance through a recent winter with more than 50 freeze/thaw events, I'm convinced of its viability in this climate.

One issue I had with the material is that it came with many pieces that had deep depressions and sharp edges we had to work our way around. Nonetheless, the beauty of the material is unsurpassed, with swirls of color and unique splotches making each piece a work of art.

Ultimately, however, beauty wasn't the only factor that won me over: First, the material's coefficient of friction actually increases when it's wet, which makes it ideal for watershape environments. Second, it has a compressive strength beyond 17,000 psi – almost double that of Pine Hall's wire-cut brick and more than double that of the strongest concrete pavers. Finally – and a detail of great importance where I live – its coefficient of absorption was less than that of any product I have used.

These facts, coupled with the absolute beauty of the stone, convinced me to go ahead with it around one pool and for the entryway of another project. These weren't decisions taken lightly: The cost in the case of the pool paving was close to $30,000, but it has proved to be the right move.

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Wood: While used mainly around aboveground pools and spas for reasons of economy (after all, raising a stone terrace up to pool's level could prove to be quite expensive), I've also seen wood used very effectively around ground-level pools.

In the best cases, it creates a distinctive boardwalk effect – powerful imagery for clients who spent time as children walking the boardwalks at various east-coast beaches and swimming in the ocean.

The biggest enemy of wood, of course, is constant wet/dry cycling, which makes it imperative to seal wood thoroughly around watershapes. As alternatives to standard decking materials such as Redwood or Cedar, you might also look into the availability of Ipé (an exotic hardwood) or even composite products.

Grass: Who says you need paving at all when you can have grass come all the way up to the back of the coping or even to the edge of the pool? I personally like the idea of "softscaping" around pools, but that's sometimes tough to get across to clients and contractors in our region who've been trained to expect or deliver three feet of coping and concrete with every pool.

going for it

The list above is far from comprehensive – I've left out the entire world of tile options, for example – but it's a solid, practical start. I can't leave this discussion, however, without mentioning the special challenges that come when the area around a watershape is intended to follow a path dictated by Mother Nature.

As I write this, in fact, we're working with on a pool that will look as much like a pond as we can manage. So far, I've set about 40 tons of boulders and slabs around the pool (*not* as a ring of stone, mind you) to create a creek/waterfall system that flows into the pool. The remainder of the space will be planted to blur the pool's edge and create visual transitions that will make the client's vinyl-liner pool seem as natural as can be.

I'll share that project with you when we're all done. In the meantime, look into this list and all of the additional options available to you where you live and find some joy in the richness of the palette we have to work with as watershapers: There are amazing possibilities out there for those who think things through and know how various options will perform in clients' backyards. 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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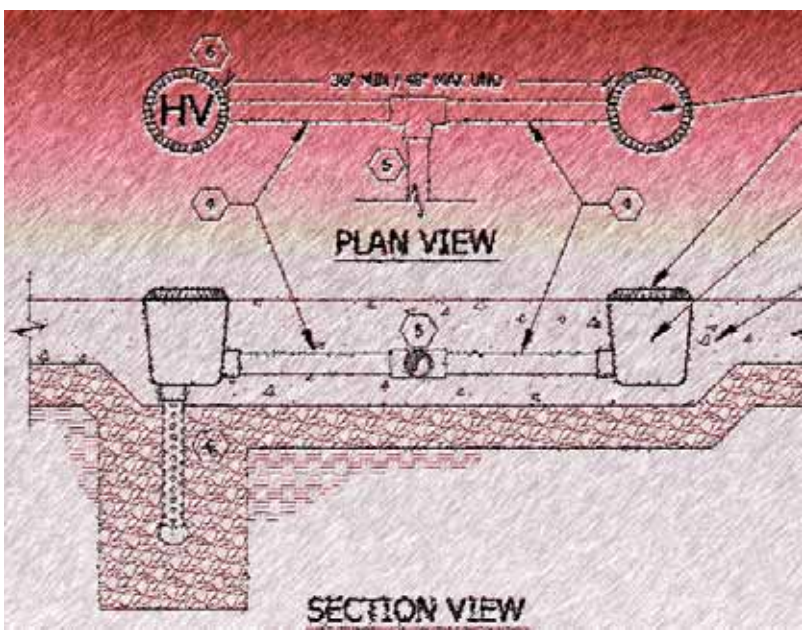
By Dave Peterson

Entrapment Meltdown

The good news in all of this is that many pool designers and builders are aware of the issues underlying hydraulic and safety practices and have little to worry about.



I hadn't planned on breaking away from my coverage of the National CAD Standard anytime soon, but recent events – including the arrest of a pool builder on charges of manslaughter in a suction-entrapment incident – compelled me to do otherwise.

As I started composing this column, my plan was to call it "Entrapment Rundown" and make it a straightforward, positive summary of recent changes in codes and systems related to suction entrapment. As I dug more deeply into the topic, however, I found the issues and solutions to be much more confusing than I'd anticipated – so much so that describing the situation as a "meltdown" seemed *far* more accurate.

Much of my digging came as a result of being called in by a couple of well-known hotel chains to perform safety audits on their facilities and help them figure out what compliance with the new Virginia Graeme Baker Pool & Spa Safety Act really meant. Simultaneously, I began receiving calls from builders and even inspection officials wondering the same thing.

All I can say at this point is that nobody has all the answers – and that, every day, more and more misinformation seems to end up swirling its way around a grand sump of conjecture.

Based on the phone calls we get, I'm guessing that few people have actually purchased (let alone read) the relevant documents from the American National Standards Institute (ANSI) or downloaded copies of any relevant local codes or regulations. To improve that situation, my ambition here is to review information from all currently available sources and do what I can to clarify the situation.

Put on your seatbelts: It's going to be a bumpy ride.

finding the way

So far, I've found five sources of information that must be consulted to make sense of these issues:

- **ASME/ANSI A112.19.8-2007:** On February 5, 2007, ANSI and the American Society of Mechanical Engineers approved a document officially titled, "Suction Fittings for Use in Swimming Pools, Wading Pools, Spas and Hot Tubs." Most of this text describes specific requirements for suction outlet covers/grates, covering materials and markings as well as testing procedures.

According to the standard, all suction-outlet covers/grates are required to be labeled with information on the maximum flow rating and product life span as well as guidance on approved mounting location(s) and a statement on the fitting's suitability for use on single- or multiple-drain systems. (There are other requirements, but these are the important ones.)

Another key element of ASME/ANSI A112.19.8 is its establishment of dimensional requirements for field-built sumps. In my operation, we've always favored using injection-molded sumps because they guarantee compliance with known requirements, but we're also aware that many builders leave sump design to a shotcrete crew that does little more than dish out a small divot around a pipe. By the time that pipe is sealed with hydraulic cement and the plasterers have lined

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the sump, there is literally no clearance below the cover/grate.

Building it right without an injection-molded fitting, of course, requires the steel to be adjusted and the sump formed. If you take this path, what you need to know is that the horizontal dimensions need to match or exceed the dimensions of the suction outlet cover/grate *and* that the vertical dimension measured from the top of the pipe to the lowest point of the suction outlet cover/grate should be one-and-a-half times the pipe's inside diameter.

To illustrate: If you use four-inch plumbing, the sump must be at least 3.99 inches times 1.5 – that is, six inches deep if the pipe enters vertically through the floor. If the pipe enters *horizontally* through the sidewall of the sump, at least 4.5 *additional* inches will needed and the total depth of the sump will need to be 10.5 inches.

One last point: ASME/ANSI A112.19.8 addresses only four of the five types of entrapment, mentioning body, limb, hair and mechanical entrapment but *not* evisceration. This is primarily because evisceration is easily avoided as an issue by installing virtually any drain cover and keeping the flow rates at reasonable levels.

◗ **ANSI/APSP-7 2006:** ANSI and the Association of Pool & Spa Professionals approved this standard, called "Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs and Catch Basins," on September 11, 2006, several months before ASME/ANSI A112.19.8 was approved. The two standards were in simultaneous development, and the committees shared many members. (I myself was briefly involved in developing ANSI/APSP-7 at a time when I managed the engineering department for a manufacturer).

So what does ANSI/APSP-7 add to the subject? For new construction, the standard reiterates what every watershaper should already know: Split all suction outlets and keep the plumbing velocities low. It also offers guidance for retrofitting existing pools and spas that have single-outlet configurations, but some suggestions (discussed just below) are better than others and each pool and spa will likely require a different solution.

The first option is to retrofit the pool or spa with split suction outlets either separated by 3 feet or placed on different planes (that is, for example, on a spa floor and on a vertical wall in the bench) so that a model torso covering 18 by 23 inches cannot cover both suction outlets at once. Here, the plumbing between the suction outlets must be sized so that if one outlet is covered, the remaining outlet will handle the full flow rate without generating a high vacuum force on the covered suction outlet. In other words, the plumbing cannot be downsized between the suction outlets.

Another retrofit option involves eliminating the single suction outlet altogether. Last year, for example, we completed a major remodel on a 50-by-20-foot pool where we eliminated the single suction outlet on the floor of the eight-foot deep end. We aligned the return inlets to promote complete mixing and had no concern about the pool's hydraulic performance. (For more on this approach, see Ray Cronise's Commentary in this issue on page 38.)

A variation on this outlet-elimination scheme involves converting a single suction outlet into a return inlet. This can be easy if the outlet is plumbed to the equipment area and valved to the skimmer line before the pump, because all the work can be done at the equipment area. Here again, completely eliminating the suction-outlet hazard works better than simply *reducing* the hazard with some other solution.

Another (more complicated) option involves adding a vented reservoir between an existing single suction outlet and the pump. This gravity-flow system ensures that the pump sucks only on the vented reservoir and not directly from the outlets in the pool. As the pump draws water from the reservoir, the water level drops relative to the pool and creates a pressure differential that causes water to flow from the suction outlet(s) to the reservoir.

Engineered vent systems are also a possibility, but they require implementation by a licensed engineer and are not as safe as other methods. (I'm a licensed engineer and would give a job a pass if I were asked to design one of these systems. My reasoning: I'm not sure how I could defend anyone in a potential lawsuit once the jury found out that complete elimination of the hazard had been a possible retrofit option.)

The last of the possibilities offered in ANSI/APSP-7 involves equipping an existing single outlet system with a safety vacuum-release system (SVRS) – another choice I would reject mainly because, where the five retrofitting options listed above are plumbing solutions that involve no moving parts, current SVRS systems require electronic and/or mechanical systems to function. It's a plain fact that all electronic and mechanical devices eventually fail – that is, they all have mean times between failures (MTBF) or mean times to failure (MTTF) and eventually will break down.

Temperature variations play a role in such breakdowns, while stainless steel rusts in saline water, springs fail, and ultraviolet light and heat damage plastic. I'm certain suppliers of these systems have tested them and selected components for reliability, but such systems have defined life spans and experience tells me that if something *can* go wrong with electronic controllers and mechanical devices used with watershapes, it inevitably *will* go wrong.

It's also true that SVRS systems are only a partial entrapment solution: Hair and mechanical entrapment are still issues with them. Bottom line: We have better options.

◗ **Virginia Graeme Baker Pool & Spa Safety Act:** This legislation is federal, nationwide law, not a standard. Signed on December 19, 2007, it's most significant requirement is that by December 19, 2008, all public pools must be equipped with ASME/ANSI A112.19.8-listed covers/grates and any with single suction outlets must be retrofitted using one of six options, some of which are proposed in ANSI/APSP-7.

The Baker Act, interestingly enough, doesn't refer directly to the ANSI/APSP-7 standard at all. Instead, it lists its six solutions for single blockable suction outlets as SVRS systems, vent systems, gravity systems, automatic pump shut-off systems, drain disablement and "any other system determined by the [Consumer Product Safety] Commission to be equally effective as, or better than, the systems described."

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The last option – that is, "any other system" – allows new devices and methods to be developed, but what's missing here are three obvious ANSI/APSP-7 solutions: splitting suction outlets, disabling single suction outlets or replumbing the suction outlet to make it a return line.

Another failure of the Baker Act is that there is no requirement for retrofitting private pools. All it says is that all covers/grates manufactured, distributed and sold after December 19, 2008, must comply with ASME/ANSI A112.19.8 and does *not* require homeowners to upgrade their pools. It does, however, require that all pools built after December 19, 2008, must have split suction outlets or single or multiple unblockable outlets or covers – or no suction outlets at all.

Consumer Product Safety Commission Guidelines: CPSC drove the Baker Act and was involved in development of both ANSI/APSP-7 as well as revisions to ASME/ANSI A112.19.8. In fact, CPSC made its positions clear as far back as January 1998 with publication of "Guidelines for Entrapment Hazards: Making Pools and Spas Safer" – a document it updated in March 2005.

Many of CPSC's guidelines are carried in ANSI/APSP-7, but there are additional suggestions about inspection requirements that didn't make it into the standard, and there's also a lot of background information and statistics on entrapment-related deaths and injuries.

International Code Council: ICC publishes both the "International Residential Code" and the "International Building Code" – and this is where I found the biggest mess of all with respect to entrapment-related recommendation.

Simply put, SVRS manufacturers managed to get their devices written into these codes as requirements in a context that creates a false sense of security about the devices. In fact, the codes start by requiring split suction outlets and then specify use of SVRS systems that will activate only if both suction outlets are completely blocked.

This is a clear case of the code writers not understanding the technology or perceiving the consensus of the standards that listed grates/covers and split suction outlets to get the job done. All ICC has done is mandate a third device – a backup that provides scant benefit if the first two safety measures are in place.

More specifically, the "International Residential Code" includes its SVRS requirement as an appendix that won't necessarily be adopted by all states, but the "International Building Code" jumps right into the thick of things in section 3109.5.2 by requiring "Atmospheric vacuum relief systems" in the event grates/covers break or go missing and, in section 3109.5.3, by requiring that dual-drain systems must be piped to SVRS systems.

So ICC requires builders to add SVRS devices onto pools with split suction outlets where they would only react if both outlets were completely blocked and where the SVRS devices do nothing to

solve the problem of hair and mechanical entrapment. Even ANSI A112.19.17-2002, "Standard for Manufactured SVRS Systems," acknowledges this limitation and requires manufacturers to state the following: "Warning: Due to the lack of physiological data, it cannot be concluded that a device of this type referred to hereafter as a Safety Vacuum Release System (SVRS) will eliminate the potential for disembowelment."

At this writing, APSP is sparring with ICC over the SVRS issue, but it's clear that ICC doesn't understand the engineering issues and is too caught up in recent headlines about suction-entrapment accidents to make negotiations as direct as they should be.

moving forward

To make as much sense as I can out of this alphabet soup of standards, codes and recommendations, allow me to offer some guidelines related to new construction, retrofits and more.

Before I begin, however, let me provide the following disclaimer: Please note that I do not represent any of the standards-promulgating bodies listed above and am not a member of any of their committees or supervising organizations or of any code-writing or compliance agency. For specific clarifications on the documents, consult the authoring organization(s): These are my own opinions, and it is your responsibility as designers and builders to ensure safety at every level.

This column does *not* address every situation, nor even all the opinions of this writer. In sum, this subject matter is exceedingly complicated, and I recommend seeking very specific, case-driven professional advice when a solution is not obvious or been proved to be effective.

With all that in mind:

◗ **New Construction:** First, consider whether you even need suction outlets. For a basic pool, the skimmer(s) may be enough – and elimination of the hazard is the safest solution. If suction outlets are required, however, always split the outlets even if you are using unblockable covers/grates. This will significantly reduce or eliminate entrapment hazards if the cover/grate is broken or missing.

In separating suction outlets, set them up with three feet of distance between the cover/grate fittings – or locate them on different planes, as suggested previously. Some codes require a spacing of three feet, center to center, as measured at the pipes, but others don't mention the pipes. Although this standard is not law, you can bet that plaintiff's attorneys will present these standards as exhibits.

I would also suggest using ASME/ANSI A112.19.8-listed covers/grates and making sure that the listed flow rates are not exceeded. Also, verify that the fitting is approved for its position (on a wall, in the floor or suitable for both). In addition, you should limit the velocity in the line between the two sumps to four feet per second, as determined by considering the maximum flow rate.

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For example, a spa jet pump running eight jets at 15 gallons per minute each will require 120 gpm total. This will require a four-inch diameter PVC line with a potential velocity of 3.1 feet per second (if one drain is blocked). In normal operation when neither drain is blocked, you would expect about half of the total flow to pass through each suction outlet – a normal velocity of one-and-a-half feet per second.

On a personal note, I proposed a two-foot-per-second limit during a meeting of an ANSI/APSP-7 committee in 2004, and the room burst into laughter and groans as if that was something that simply couldn't be done. That's true if you use two-inch pipes and two horsepower pumps, but with half-horsepower pump on an unfiltered waterfeature, it's possible to develop a flow rate of more than 80 gpm if you use three-inch diameter suction pipes (as I would recommend) or two-and-a-half-inch pipes using ANSI/APSP-7 criteria.

Another step I recommend is making a note with a permanent marker on the time clock or controller of a planned replacement date for the covers, as per ASME/ANSI A112.19.8. As is the case with SVRS devices, covers/grates are beaten up by sunlight, chemicals, being stepped on and other factors that result in a finite life span. They should be replaced before they fail, not after an injury or death has occurred!

◗ **Retrofit Construction:** Always split the outlets as in new construction (see above) or eliminate the hazard completely by abandoning the suction outlet and relying on the skimmer alone for circulation needs – or by reversing the flow so the outlet becomes an inlet. In addition, validate the size of all pumps: Chances are good that they were oversized by the original builder and that you can use this as an opportunity to guide your client to energy-efficient variable-speed pumps.

◗ **Unblockable Suction Outlets:** Both ASME/ANSI A112.19.8 and ANSI/APSP-7 use a simulated torso 18 inches wide by 23 inches long to determine if a suction outlet is blockable – a sizing meant to encompass the fact that 99 percent of men, women and children have torsos smaller than that and would not block the drain. (I guess we all should pity the one percent of outsized men.)

The important thing to note here is that standard grates/covers measuring 18 inches by 18 inches are blockable and should not be used singly. I've heard builders argue that if you measure these grates diagonally, they measure 25.5 inches and the model torso will not be entrapped. But that's bogus reasoning, since it fails to consider those who might become entrapped while aligned with the grate. In this context, only 24-inch-square grates do the job of providing the minimum unblockable suction-outlet dimensions.

(An alternative would be a channel drain more than 29 inches long designed so that, when challenged by the model torso, the remaining open channel drain is still capable of handling the maximum designed flow rate.)

One retrofit solution that is not outlined in any of the codes is changing the single suction outlet to an *unblockable* single suction outlet. For example, if an old

This spa has split suction outlets on the floor for the filter pump and split suction outlets in the bench walls for the jet pump.

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INTERVIEW

Looking Beyond the Buzzword: Bruce Zaretsky on Sustainability

Sustainability is a hot buzzword in the world of landscaping these days, but Bruce Zaretsky is no Johnny-come-lately to the concept.

According to Zaretsky—owner of Zaretsky and Associates, a landscape design, installation and consulting firm near Rochester, N.Y., and a monthly columnist for *WaterShapes*—he's been concerned with sustainability throughout his career.

In this far-ranging interview, Zaretsky gives his perspective on the importance of sustainability, how natural processes can enhance it, why it will create enormous business opportunities and more.

To read this thought-provoking piece, go to WaterShapes.com and click on Interview.

IMAGE GALLERY

See Why Inventor David Whiteis Loves Having His Bubble Burst

In his article in the August 2008 issue of WaterShapes ("Shaping Bubbles" on page 46), inventor David Whiteis described what it takes to generate, as he calls them, *bubble rings*—circlets of air that rise coherently through pool water until their transit is interrupted or they burst at the surface.

To watch videos of the results Whiteis has achieved, go to WaterShapes.com and click on Image Gallery.

In this project, the skimmer above the sun shelf has a pair of equalizer lines located on the wall between the sun shelf and the spa, spaced 36 inches apart.

pool is unnecessarily deep, it's easy enough to dowel in some reinforced concrete, build a proper 24-square-inch sump and install an approved cover/grate with the new pool finish. In this way, you fix the drain by filling in an unused part of the pool and never even touch the old plumbing system.

◗ **Skimmer Equalizer Lines:** When I'm asked about what to do with skimmer equalizer lines, I always suggest splitting them. If a float valve is installed, it has the capacity to shut off the skimmer when the water level drops below the weir; in doing so, it eliminates the skimmer as a vent and the pump is then pulling on the submerged suction outlet as though it was directly plumbed to it.

Look at it this way: When the skimmer no longer serves as a suction outlet, the equalizer line effectively becomes a suction outlet and should be split. (Some builders don't install the float valves, but you can't ensure that an owner or service technician won't drop one in the skimmer to adjust the skimmer/suction outlet flow ratio.)

◗ **Combined Suction Outlets Under Shared Covers/Grates:** We always separate our spa jets from the filtration system, which results in two pairs of split suction outlets. Some builders gang these pipes together so that the finished spa only has two covers/grates, but I don't like that detail for two reasons: First, the filtration outlets should be on the floor while the jet pump outlets should not; second, this arrangement can be dangerous if the math hasn't been done correctly.

An eight-jet system running on a two horsepower pump may flow at 125 gallons per minute. Combine that with a filter pump moving 65 gpm at 40 feet of total dynamic head (with a half-horsepower pump!) and you have a combined total of 190 gpm, which exceeds the recommended rates for many of the covers/grates listed as part of ASME/ANSI A112.19.8.

Under normal operation, the flow rate is split with only 95 gpm flowing through each cover/grate, but the design needs to be redundant and capable of handling the full flow through just one side. This is why we always split the filter pump's suction outlets and keep them on the floor where the heavy debris settles – then we split the jet pump outlets on the bench walls, putting them below the seat where they are less likely to pull in sand or other settling debris. With this configuration, our velocities through the covers/grates are lower and the whole system is improved in terms of safety and energy efficiency.

keeping up

The good news in all of this is that many pool designers and builders are aware of the issues underlying hydraulic and safety practices and have little to worry about. The bad news is that other builders who may have been lucky to date are walking on thin ice these days, as it seems serious legal jeopardy awaits some of those who don't follow the rules.

It is simply unwise in this climate to run the risk of having a cover/grate get broken or come off a single-port suction outlet – the greatest risks in suction-entrapment incidents. All it takes is simple action: The last time I checked, there had yet to be an entrapment death resulting from contact with a properly secured, correctly flow rated, ASME/ANSI A112.19.8-listed cover/grate on a split-suction pair of outlets.

To be sure, there's some confusion out there. The key at this point is for the industry to get organized and be certain that health departments and code writers know the full story and can be persuaded to accept the fact that, in many cases, suction outlets aren't even needed. WS

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.*

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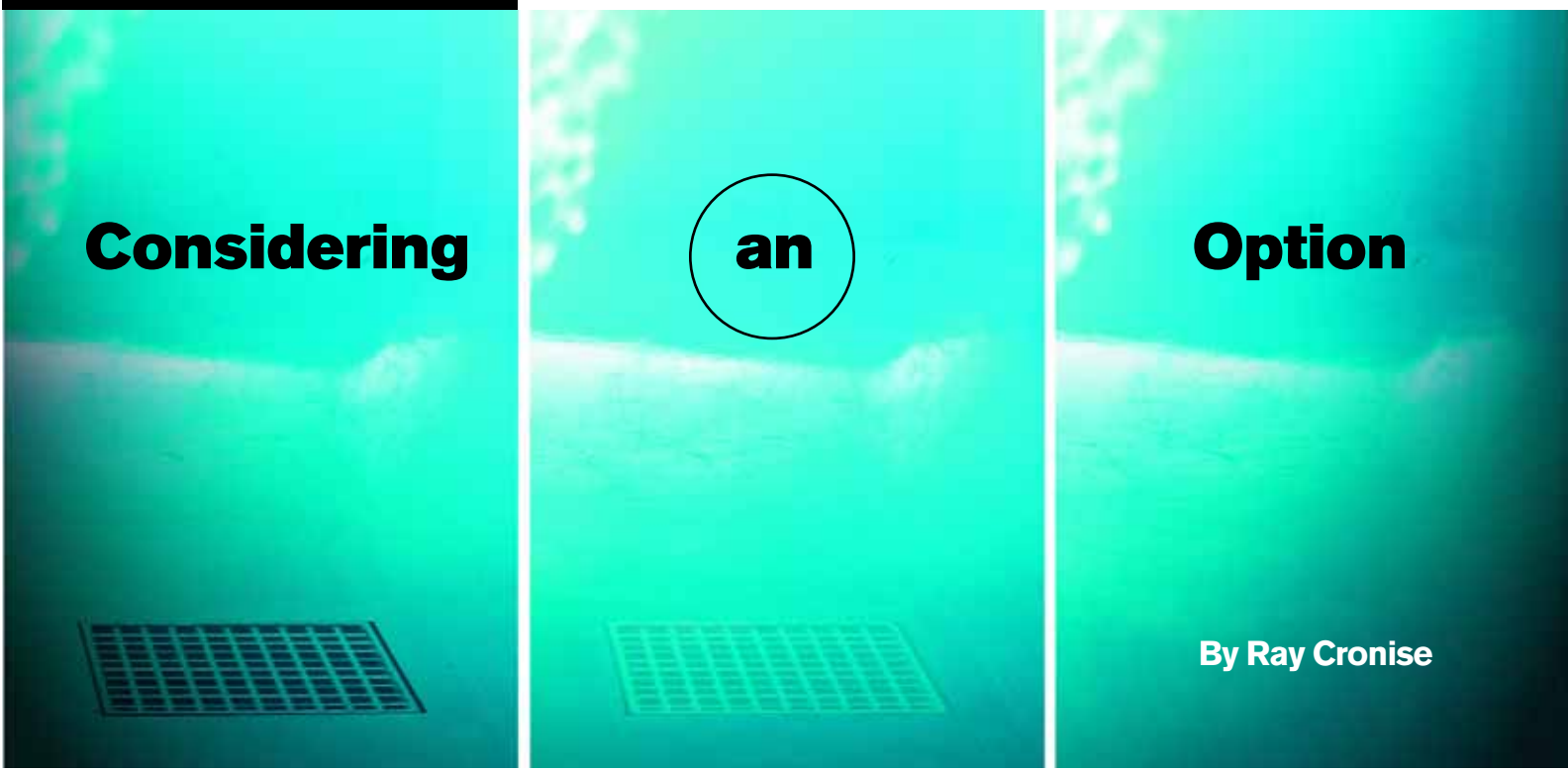

Considering an Option

By Ray Cronise

Most suction-entrapment accidents occur when someone gets caught on a swimming pool, spa or wading pool drain that has somehow been compromised. This fact prompted Ray Cronise, a former NASA scientist and current pool company executive, to take a scientific approach and use sophisticated computer software to see what was really going on. His conclusion: For proper circulation, watershapes don't need the drains that seem to be the focus of the problem.

The death in 2002 of the granddaughter of former U.S. Secretary of State James Baker brought the problem of suction entrapment to unprecedented public attention.

That incident – and others in which bathers have become stuck atop pool drains – have led to development of new legislation and pool-construction standards as well as increased awareness of the hazard. To me and some others, however, the new rules represent a reactive, regulatory solution to what might better be approached as a proactive matter of technology and engineering.

In stepping back and carefully examining the anatomy of these terrible accidents, it becomes clear that, although steps can be taken to *reduce* risks, there is no single approach, given current design and construction practices, that will *eliminate* risks altogether. So far, in fact, all of the industry education and media attention we've witnessed is focused on solutions that at best mitigate entrapment hazards. These are *not* approaches that lead us to complete solutions.

As an industry, we have not grappled with what I see as the true, addressable core of the issue – that is, whether the drains really need to be there in the first place.

Common wisdom and long-established building practice hold that these suction points are needed to achieve proper circulation in watershapes, and such thinking is so ingrained that many building codes and health departments mandate their use. What is surprising is that most state codes are very specific in acknowledging that the inlets (or returns) are what distribute sanitizer and circulate the water. Armed with that fact, it should be clear that adequate circulation can be achieved by proper positioning and orienting of inlets and by using skimmers as a sole source of suction.

In fact, I am now convinced that drains can be omitted from most watershape circulation systems – a step that would entirely eliminate the risk of suction entrapment. And this isn't just my belief: Recent research has taken this thought and given it real substance.

We can't, of course, simply outlaw drains. Right now, in fact, we need them as sources of water for spas, waterfeatures and other systems that call for flows that exceed what current skimmers can provide. But that in itself is simply a technological issue – one that definitely should be addressed by companies that manufacture these fittings.

pool-drain issues

The pool and spa industry has been broadly aware of suction-entrapment risks at least since the late 1970s and has long been aware that submerged outlets (that is, *drains*) can be especially hazardous to children.

Since the 1980s, at least 150 entrapment incidents have been documented, including nearly 50 in which death was the outcome. When weighed against the millions of people who safely use pools and spas each year, that number may be statistically insignificant, but the horrific and needless nature of these tragedies nonetheless requires us to pursue reliable solutions to the problem.

Complicating the issue somewhat is the fact that five different forms of suction entrapment have been identified: hair entrapment, body entrapment, limb entrapment, evisceration and mechanical entrapment (which is not technically a form of *suction* entrapment). Each type involves a different underlying physical phenomenon that makes developing firm, broad-scale, mandated solutions difficult. It's also less than helpful that system configurations vary widely and that there's also a complex interdependency among various entrapment-mitigation strategies.

We know, however, that children are most often at risk of suction entrapment because they can become fascinated by the currents created by drains and will often intentionally stick their hands and feet on them to experience the force generated by the suction. In the case of wading pools, that fascination might lead a hapless child to sit on the drain.

The grim realities that attend discussion of these issues make almost every aspect of them controversial. My own experience has shown that running in the face of industry practice by suggesting that drains are unnecessary is itself controversial, even though it removes suction entrapment on drains as a practical possibility. I can't fathom the resistance to this idea, but as mentioned above, I and others have long thought "drainless watershapes" to be a concept worth exploring.

Furthermore, I have for some time believed we all needed to step back and take the emotion out of our conversations by using a scientific approach, developing an understanding the underlying physics of suction entrapment and then applying what we might learn in the field.

This sort of investigation is familiar to me: Before forming Trilogy Pools, a fiberglass-pool manufacturer in Fayetteville, Tenn., I was employed by the National Aeronautics & Space Administration doing research in microgravity material science and saw the potential for using advanced computer modeling to test ideas and reach conclusions based on fact rather than supposition or habit.

With some help, I was able to simulate water circulation in computer models of pools that were identical to one another except for the presence of a drain in one version and the absence of a drain in the other. The results showed that not only can inlets and skimmers provide adequate circulation but, further and counterintuitively, that the addition of drains does *nothing at all* to improve circulation. This in fact supports what most state codes once specified – that it is the inlets rather than outlets that ensure proper circulation by virtue of the way they distribute water within pools.

In a realm in which the only acceptable number of suction-entrapment incidents is zero with zero deaths, I believe that the reliable solution we've all been looking for is at hand.

debunking drains

Part of the problem with the pool industry's approach to circulation systems has to do with its longstanding, uncritical acceptance of design and construction precedent – an approach based on tradition more than on engineering and science. Although there have certainly been voices (in the debate about suction entrapment in particular and hydraulic design in general) that do reflect a more disciplined engineering perspective, they have failed to gain significant traction or counter the weight of sanctioned, standard practice.

In point of fact, the pool industry has traditionally used drains in the belief that they are required to ensure circulation at the deepest point of the pool and avoid accumulation of contaminants in supposed "stagnant areas" near that low point. When considered in light of basic fluid dynamics, however, it becomes clear that this desired effect simply does not occur.

In stepping back and carefully examining the anatomy of these terrible accidents, it becomes clear that, although steps can be taken to *reduce* risks, there is no single approach, given current design and construction practices, that will e*liminate* risks altogether.

Indeed, the simple existence of in-floor cleaning systems is evidence that drains do almost nothing by themselves to remove material and contaminants from the bottom of a pool. These systems rely on strategically placed, moving floor returns that push debris to the drain, but while they provide an example of good use of a drain, these in-floor systems are themselves under attack as a result of generic dual-outlet piping mandates that disallow installation of drains in series. (What is needed here is another reasoned technological solution and more flexibility than traditional dual-drain T configurations allow: The fact is that drains in series are often used safely.)

Here's a simple analogy that illustrates the source of this misconception about the role of drains in circulation systems: We all know you can blow out a candle at arm's length. What most people don't know is that it is impossible to *suck* out that same can-

dle: Air can effectively be *pushed*, but it can't readily be *pulled*. The same holds true for water flowing in or out of pipes: As with an in-floor cleaning system, you can push debris in a general direction, but it's impossible to reverse the physics and achieve the desired effect of cleaning up a pool's floor by sucking the debris. Even the most efficient drain's influence is measured in inches, not feet.

To accommodate the persistence of standard practice, the industry has developed a number of approaches that seek to increase the safety of the drains it installs:

- *Drain covers* have been modified to include improved safety features and seem to help, but there is no protection if the cover is broken or missing – a factor that continues to be a root cause of entrapment incidents and therefore make these covers less than serviceable as part of a complete solution. (Some 15 years ago Valerie Lakey was severely injured in an entrapment accident because the screws were missing from a cover – the same reason Kiah Milsom died in July 2008.)

An important element of the new ASME/ANSI A112.19.8-2007 has to do with testing of the cover and sump along with the fasteners as a *system*. Not all testing laboratories are following the standard, however, with the result that the very deficiencies that cause the problem – that is, missing screws or insufficient attachment – may *not* be addressed in hundreds of thousands of covers now being replaced in compliance with new federal legislation.

- *Safety vacuum-release systems* have been developed that will shut off a pump when the SVRS device senses an excessive vacuum buildup, but this approach adds considerable expense to a project, does not necessarily provide protection from all forms of entrapment (especially the transient or incomplete blockages associated with evisceration and hair or limb entrapment) and presents the risk of mechanical failure of the sensing system itself.
- *Multiple (dual) drains* have been identified as a possible preventive measure. Although there has never been a documented suction-entrapment accident on a dual drain that has been properly installed, covered and maintained, the risk is negligible. Yet in absolute terms, dual drains are also subject to improper maintenance in the same way as are single drains. Further, I would argue that because all suction-entrapment accidents are statistical anomalies, we cannot reasonably assume that simply because a multiple drain hasn't yet been implicated in such an accident doesn't mean it is entirely beyond the realm of possibility.
- *Proper flow rates* are extremely important for a variety of reasons, and it is true that drains operating within specified flow rates with proper covers or grates have the ability to minimize risk. In practice, however, it's unreasonable to assume that all designers and installers will adhere to sizing guidelines for pumps and plumbing. In fact, we have seen increasing evidence of underestimated flow rates in efforts to comply with new "green" legislation. As a result, while mandating proper flow rates is beneficial on a number of operational and safety levels, such requirements alone will not completely solve the problem.

It's my position that none of the improvements that have been offered or proposed to date *completely* removes the risk of injury or death: So long as drains continue to generate powerful suction forces; so long as grates may become damaged or malfunction as a result of improper installation; so long as screws continue to go missing; so long as pumps might be oversized; and so long as SVRS devices are tested with one set of piping and flow conditions and installed in completely different and unknown environments, bathers will be put at some level of risk.

As a result, I have chosen to tackle the problem from the direction of asking whether drains are even necessary – an approach that has led me to a further exploration of whether there is any circulatory advantage to drains being there in the first place.

computer simulation

While it seems obvious to those trained in fluid dynamics that the presence or absence of a drain would not significantly influence circulation dominated by high-velocity return inlets, I thought: *Why not just prove it?* Some of the best discoveries happen when you test a hypothesis and see where the results fall. And if the candle analogy holds, I thought it would be fairly easy to demonstrate that, in fact, the inlets (rather than the outlets) are what dominate pool circulation.

In this vein, my hypothesis was that simply pointing the returns toward the bottom would create adequate circulation in a pool with or without a drain. Debris with a density less than water would be suspended and eventually removed by the skimmer; debris with a density greater than water would sink to the bottom, where a vacuum-cleaning device of some kind would remove it.

I have chosen to tackle the problem from the direction of asking whether drains are even necessary – an approach that has led me to a further exploration of whether there is any circulatory advantage to drains being there in the first place.

In-floor cleaning systems offer an exception, but in the absence of such an alternative approach, my hypothesis held that there is really no compelling reason to install a drain to achieve proper pool circulation.

Based on my experience at NASA, I knew of technical advancements that make it possible to simulate the flow of fluids with a great deal of accuracy. That in mind, I approached the New Hampshire office of ANSYS, a computer-modeling firm based in Canonsburg, Pa., and asked for help. ANSYS had developed Computational Fluid Dynamic (CFD) software that allows engineers to model the flow of either liquids or gases (or both) within defined areas while also systematically determining the effects of inflows, outflows, obstructions, boundaries and a wide range of other factors.

This is the sort of software that engineers use in designing

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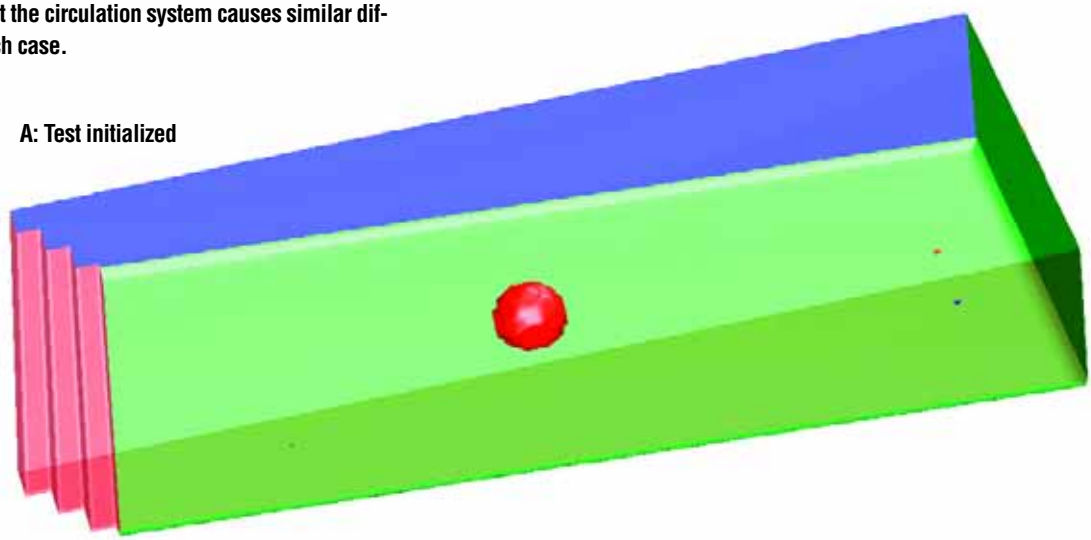
These computer-modeling readouts show what happens after a sphere of contaminant (A) is introduced to pools identical in every way – except that one has a drain (B & C) and the other doesn't (D &E). The red indicates where the contaminant has a mass fraction of 0.0016, and it's apparent that the circulation system causes similar diffusion in each case.

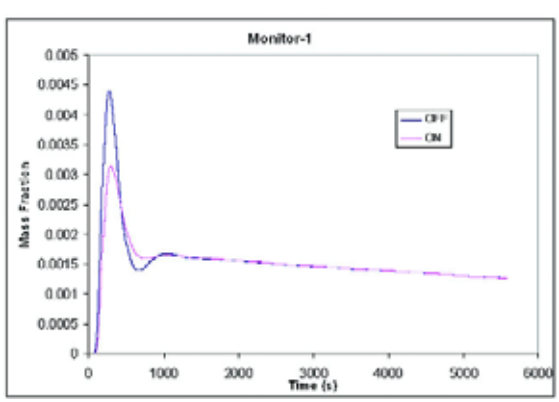
A: Test initialized



automobiles, airplanes and mass-scale heating and cooling systems for buildings, power plants and chemical plants – not to mention a range of products and processes that depend on fluid flow. (Moving closer to our aquatic endeavors, this same software was used to engineer the high-performance skins that helped Michael Phelps set all those records and win all those gold medals during the Beijing Olympics.) The key benefit of CFD software is that it enables engineers to simulate fluid flows while avoiding the time, expense and measurement difficulties involved in actually building and testing designs.

I worked closely with the consulting engineers at ANSYS to simulate the flows of water through computer models of swimming pools, both with and without drains. The concept pool was 15 feet wide by 35 feet long and had a depth of six feet at one end and three at the other. The pool had four inlets arranged around its perimeter to provide circulation and a skimmer at the waterline through which water exited the pool. Both pools had circulation rates of approximately 60 gallons per minute (slightly higher than the 50 gpm required for a six-hour turnover rate with a pool of this size); one had a split main drain, the other had none.

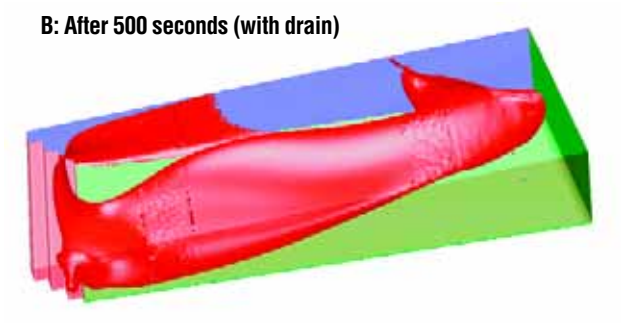
As a first exercise, we computed the steady-state flow fields in the two pools. In both cases, we observed that large-scale circulation was mostly driven by the returns. We then placed a two-foot-diameter contaminant sphere (that is, a tracer) in the center of the pool near the floor. Multiple mon-

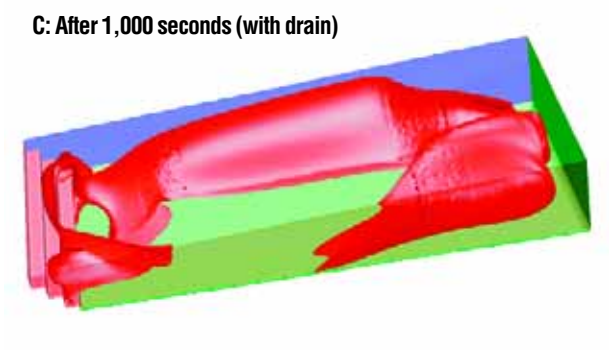


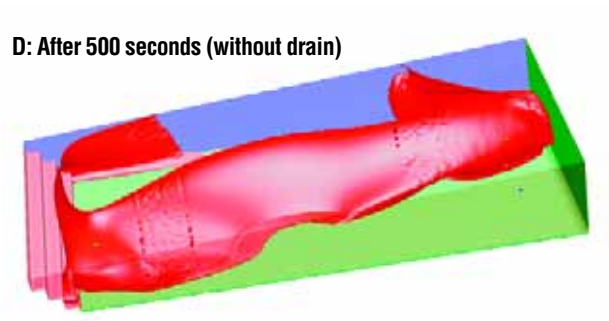
Monitors were positioned at each end of the pool – two feet below the surface of the shallow end and three feet below the surface of the deep end. Shown here is a comparison of contaminant's mass fraction through time, both with and without drains in the shallow end of the pool (where the difference was greatest, although similar results were observed at the other monitoring points). The contamination level was higher without main drains for a short period, but the level dropped after about 600 seconds and there was no visible difference after 1,000 seconds.

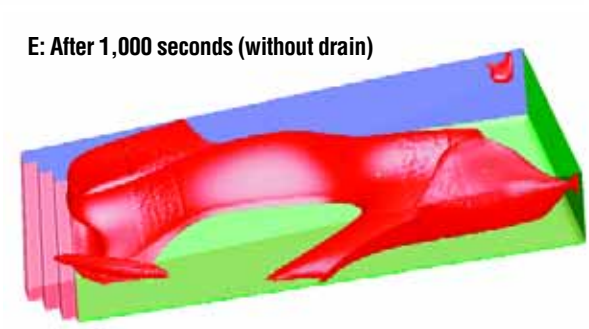
Editor's note:

Ray Cronise's 'Commentary' is provocative and bound to be controversial, and we encourage you to respond to it by writing us a letter or sending us an e-mail to register your own thoughts. What do you think? Please let us know.









itors were placed at either end of each pool, two feet below the surface of the shallow end and three feet below the surface of the deep end.

a closer look

Simulations were initiated, and the monitors tracked the concentration of the contaminants for 20 minutes. The results were both interesting and provocative: With and without drains, the pools were essentially *equal* in their ability to clear away the contamination.

In observing the contaminant loads, we noted that the concentration at each monitoring point started at zero, basically because the contaminants were initially released away from the monitors.

Once the simulation started, we noted that the contaminant concentration was lower in the pool with a drain until about 1,000 seconds into the simulation. After that, the contamination levels in both pools evened out and essentially showed identical results from that point forward. In sum, the simulations showed that having a drain neither improved nor harmed circulation in the pool.

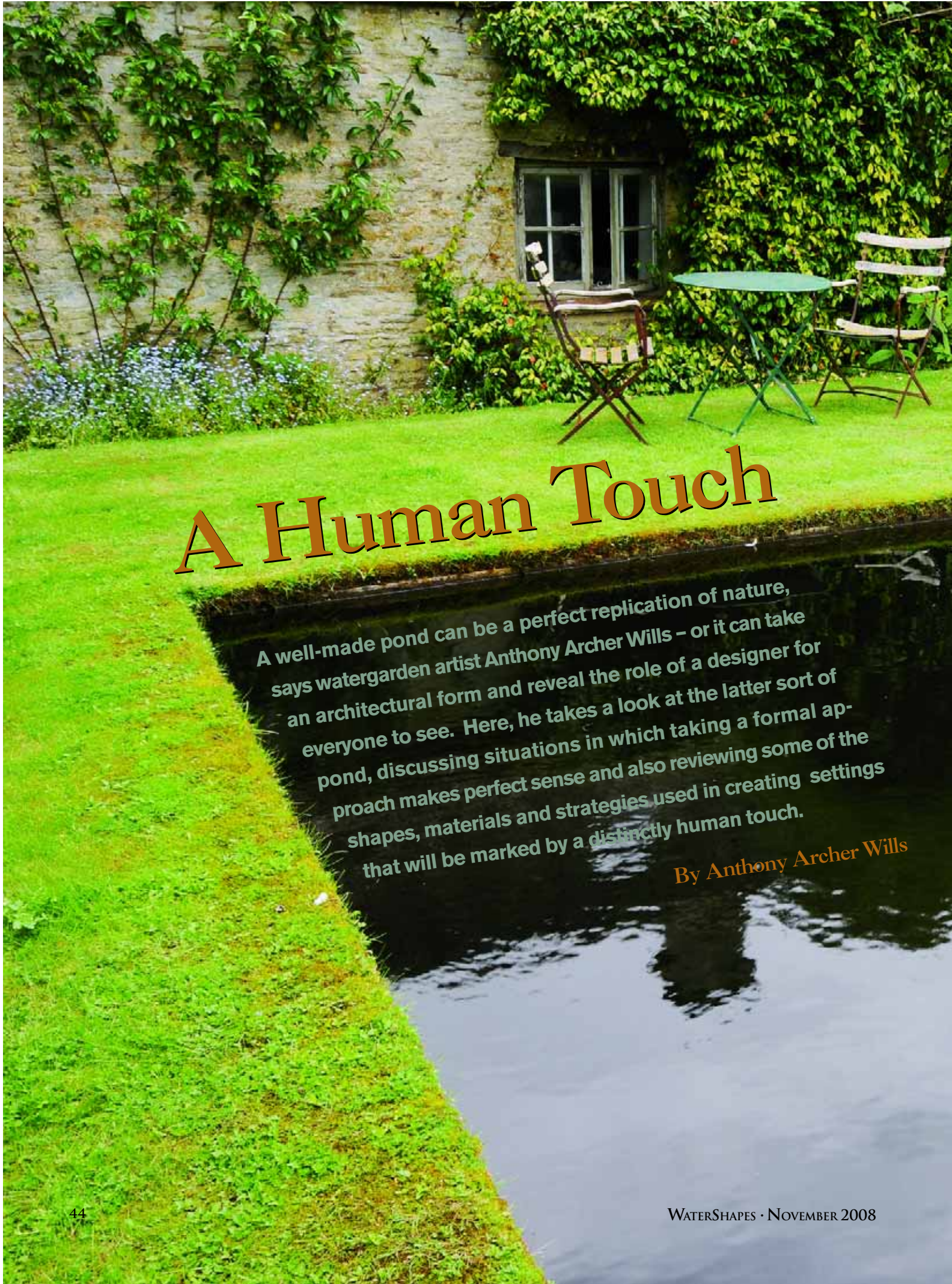
The process also showed that inlets and skimmers alone were sufficient to clear the contaminant's mass fraction to levels of about 0.0015 within about 1,000 seconds. After that point, the circulation system continued to reduce that level to about 0.0010 after 6,000 seconds – that is, 1.7 hours.

If there is no practical difference in circulation performance in pools with properly arrayed systems of inlets and skimmers and no drains, and if the presence of drains is a known agent in incidences of suction entrapment, why install drains at all? If our interest is in reducing risk to bathers, what possible reason can we have to include these suction devices in our watershapes?

Believe me, I don't fault the industry for its building practices, which have always been based on empirical information amassed in the absence of sound scientific data. The circulation of water is something that is nearly impossible to predict through observation and difficult to measure, so following precedent by using drains simply makes sense. And it makes even more sense given the fact that building codes and health departments have fallen into the same sort of empirical thought processes.

But now, CFD simulation clearly shows that drains not only are unnecessary but do not even improve the circulation in a pool or demonstrate a superior ability to clear away contamination. So let's set aside supposition and deal with fact: Now that these results are out in the open, it's time for the watershaping industry, building officials and health departments to take action and mandate that pools (with the exception of those with in-floor cleaning systems and waterfeatures that need more water than current skimmers provide) be built without drains when a sufficient water supply can be obtained from overflows. Further, industry suppliers need to focus on those exceptions and develop high-rate overflow devices (including skimmers) to make it easier to build drain-free pools, spas and associated waterfeatures.

It's my contention that future deaths and injuries can be prevented (at some cost savings, I might add) simply by designing and building future pools without drains and by sealing the drains in existing pools – or by reversing the flow through drains so that they become inlets. At the very least, this research shows that the rules need to change and that designers and builders should no longer be constrained by mandates requiring them to include unnecessary drains in their watershapes.



A Human Touch

A well-made pond can be a perfect replication of nature, says watergarden artist Anthony Archer Wills – or it can take an architectural form and reveal the role of a designer for everyone to see. Here, he takes a look at the latter sort of pond, discussing situations in which taking a formal approach makes perfect sense and also reviewing some of the shapes, materials and strategies used in creating settings that will be marked by a distinctly human touch.

By Anthony Archer Wills

As a rule, those of us who build watershapes meant for purposes other than swimming or hydrotherapy tend to pursue one path or another: Either we make our ponds, streams and waterfalls look as natural as we can manage, or we establish them to reveal the hand of man either partly or completely. In that either/or context, successful design depends at least in part on being perfectly clear with ourselves about what we are trying to achieve.

In assessing ponds of these opposing forms, it's my personal practice to look at both natural ponds and formal ponds (or, more accurately, *architectural* ponds) as being right on par with one another with respect to their potential for beauty. Indeed, architectural ponds can be incredibly appealing when done up in such a way that they reflect a particular style of architecture and accentuate and capitalize upon aesthetic partnerships.

In deciding which way to go, it all boils down to a question of which approach will be more striking in a particular setting.

In this article, I'm going to depart from the naturalistic train of thought that has characterized much of what I've written about in *WaterShapes* in recent years and will focus my attention instead on ponds with an architectural bent. My aim is to explore the opportunity these watershapes give us not only to harmonize with architecture, but also to create bold juxtapositions with nature or take advantage of the opportunity to combine forms and make a setting so much more appealing.

Seeing Anew

Growing up in England, I spent a lot of time within easy reach of natural bodies of water in the form of lakes, ponds, streams and rivers that ripple the countryside – and I've drawn inspiration from them ever since.

At an early age, however, I was exposed to architectural ponds through my grandparents, who owned several country homes at which I noticed formal ponds referred to as "lily tanks" – simple rectilinear ponds that were used ex-

clusively for growing water lilies, which were pretty much the only aquatic plants one could obtain back then.

These ponds were made of stone, concrete or brick (often with raised and crumbling edges), and there were also little ones usually lined with lead or zinc. The water was invariably clear because the plants consumed all of the available nutrients, and I still remember the beautiful white and the occasional red flowers that emerged. Watergardening was a rare hobby in those days, and my mother was a particularly enthusiastic participant.

Later on, my initial professional interest in watergardening was almost entirely a matter of pursuing the replication of nature. But the austere lily tanks I remembered from childhood came back to me when I began to grow water plants on my own and started taking more than a casual interest in what was going on in the water. That was the humble trigger for my interest in ponds of a more architectural form.

The capacity of architectural fountains to define or call attention even to small, out-of-the-way spaces is among their greatest virtues. Indeed, they can be almost any size and placed almost anywhere, giving us tremendous flexibility in deciding how to use them as part of grander design schemes.

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In traveling extensively across the United Kingdom, my interest in these watershapes grew as I noted how many country houses and large estates were adorned with some form of architectural pond, usually in the Victorian style. In addition, those I saw were very often in a dilapidated state – a fact that generally made them seem more beautiful to me as I observed the way time had worn on the materials and how nature in some cases seemed intent on breaking down the very stone of which the ponds' structures were composed.

What I also came to notice is that these architectural ponds afforded whoever installed them the opportunity to bring water into spaces that simply could not have supported any other kind of watershape. Where naturalistic watergardens frequently need large areas to achieve an appropriately natural appearance, I saw that these architectural ponds could be placed almost anywhere – and often in the most unlikely spots in tiny courtyards, patios or terraces or even on the occasional balcony.

They give us, in other words, tremendous flexibility in positioning water and how it can be used as part of a larger design scheme. In some cases, these ponds will be the only body of water on a property; in others, they herald the presence of other waterfeatures. Similarly, they might be a retiring feature partly hidden off to the side somewhere, quietly beckoning one to walk over to take full notice of them – or they can be the centerpiece of a space around which an entire, broad garden revolves.

There's really no limit to how architectural ponds can be used, so long as there's a deliberate reasoning behind their presence in a given space.

Timeless Qualities

I must come back to flexibility for a moment, because there's so much to tell about the ways in which architectural ponds can be used.

They can be subordinate parts of fountains, with water flowing into them via spouts or around raised fountain bowls – or strong architectural features in their own right. They can serve as basins for wall-mounted fountains or as simple tanks in which water lilies or emergent plants are the only things you notice. In my own work, I delight in creating tiny waterfeatures that lend atmosphere to spaces that might otherwise be completely featureless and obscure.

It doesn't take much to instill even a modest setting with an almost magical presence: Just adding water and plants (or water's sound and motion) is all it takes to transform the experience of passing from one area into another.

Indeed, even a tiny architectural pond can be established as a destination, as a place where people can step aside and have a quiet conversation or simply ponder the beauty of the plants or reflections – much as they would in the presence of a much larger body of water that would provide far more expansive views. There can be an intimacy to these ponds that is really very special and makes them cherished for what they bring to their settings: I love, for example, the way they can provide focal points seen from inside a home that draw the eye out to the garden, inviting one out for a closer look.

None of this is to imply that formal ponds can't be large or, as do naturalistic ponds, provide wonderful reflections of adjacent structures, statuary, trees or other objects of visual significance. Where they can be made large, they bring the potential of bouncing light up into dark rooms or producing dramatic reflections off their mirrored surfaces. Just like their naturalistic cousins, these large watershapes can lend a sense of intimacy to a grand setting or one of importance to an otherwise insignificant space.

No matter the scale or setting, of course, the key to effective use of an architectural pond is the same one that opens the doors of refinement for all watershapes: When used in a deliberate and purposeful way, architectural ponds can be placed in almost any type of setting with any sort of architectural style, from classic to contemporary. On that level, success is, as always, about good and appropriate design.

As you review the following clusters of images and their associated texts, please bear one last set of observations

in mind, starting with the point that geometric enclosures for water date back to the most ancient reaches of civilization.

From the Greeks and Romans on through Islamic cultures and the formal design traditions of Europe, what we see in these geometries is a desire to impose order on the untamed spasms of nature. A long, rectilinear pond at a building's entrance, for example, would give visitors a feeling of psychological or even physical comfort stemming from the presence of an ordered aquatic structure. This expression of our ability to control nature is a likely reason why architectural ponds have a place in almost all design traditions.

Crossing Bridges

In today's world, however, we've come full circle to a place where our surroundings are so orderly that we have the desire to make naturalistic elements stand out amid the rigidity of our cities. That state of affairs also brings this discussion in a full circle and carries me back to the combination of impulses I mentioned at the outset.

With architectural ponds, we have an amazing opportunity combine the formal with the natural in forms I see as representing the best of both worlds. Presented with a blank canvas, for example, we can create a natural-looking body of water on one side with brimming edges and emergent plants as might have been formed by nature itself; then we came along, adding a wooden deck on the other side – or a brick or stone terrace. With one side natural and the other architectural, it leaves us with the impression that someone tamed a portion of the space for their use without utterly destroying a natural setting.

Achieving that sort of balance represents a challenge that's been in play from civilization's very first attempts to bring water into constructed environments, and it's my belief that, in exploring these concepts in our own projects, we not only grapple with the intricacies of those challenges but also participate in watershaping's traditions in the most profound ways possible.

I'm intrigued by the possibility of bringing the architectural together with the natural and of making it seem as though one part of a pond has been tamed for our use while another part reflects the water's untrammeled, natural, ancient state. It's a philosophical bridge between forms – and a profound way to reveal the hand of man in otherwise wild-seeming settings.

An Affinity for Age

Growing up in England and having had the privilege of traveling over much of the world, I've developed a passion for architectural ponds that look *old*. Many of these watershapes have been there for a very long time, and it's fascinating to observe the ways in which the elements have overtaken their man-made structures and had their way with bodies of water that originally stood quite apart from nature.

I have the same affection for the timeless beauty and charm of very old buildings on which the stones or bricks have weathered and the mortar has worn away. I also love roofs completely covered in lichen or moss as well as walls, pathways and other structures embraced or consumed by plants. It's as if these objects of our craft are being taken back into the bosom of nature.

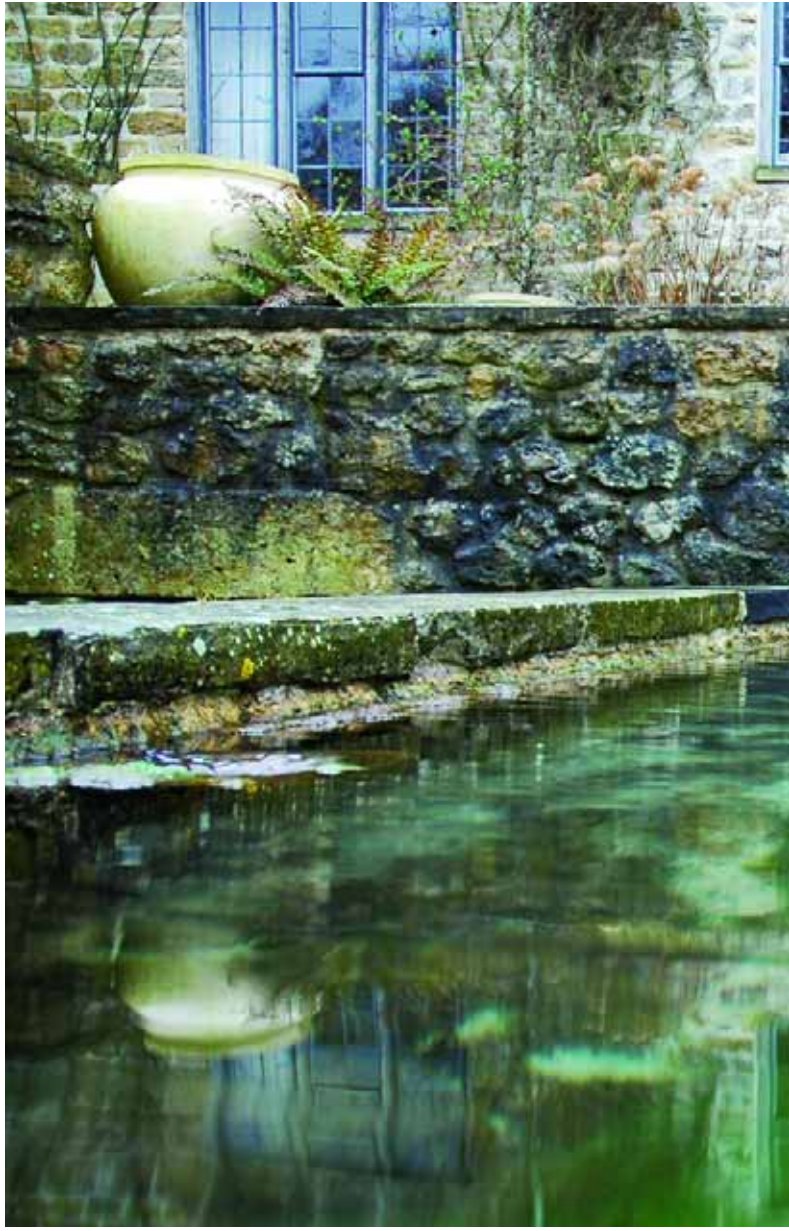
In places where these structures have been in place for hundreds of years, they've become so fused together that it's sometimes difficult to tell where craft ends and nature begins. With just a fleeting glance, you can almost sense the passage of time; with a closer look, you perceive the infinitely complex relationships between structures and nature.

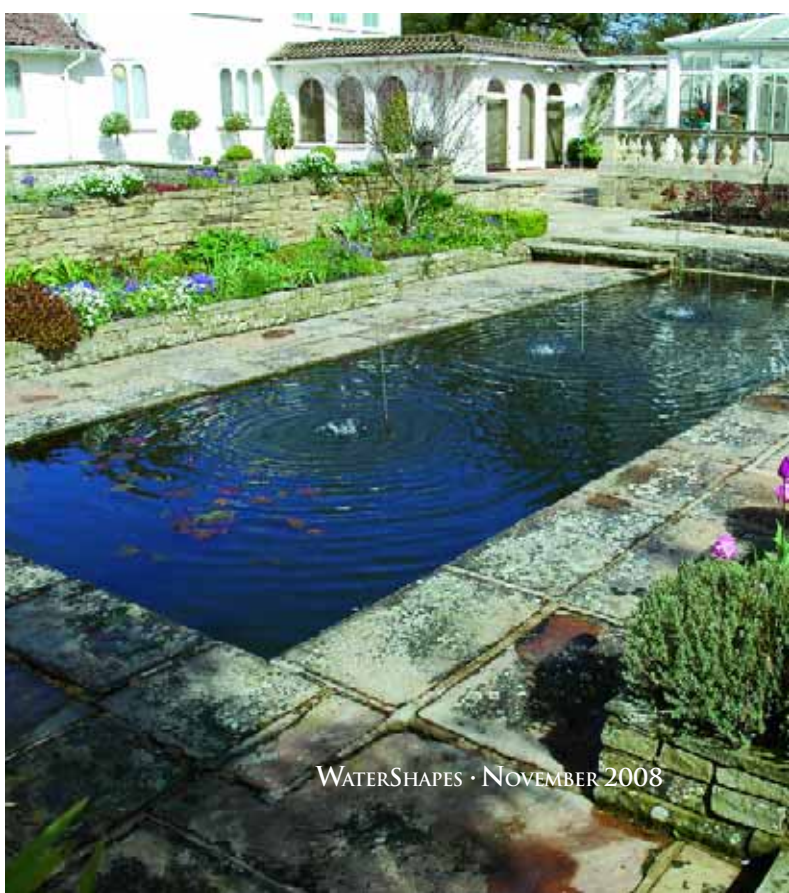
Best of all, when you combine that aged or aging appearance (genuine or manufactured) with the comforting presence of water, there's a power there that provides people with profound feelings of comfort.

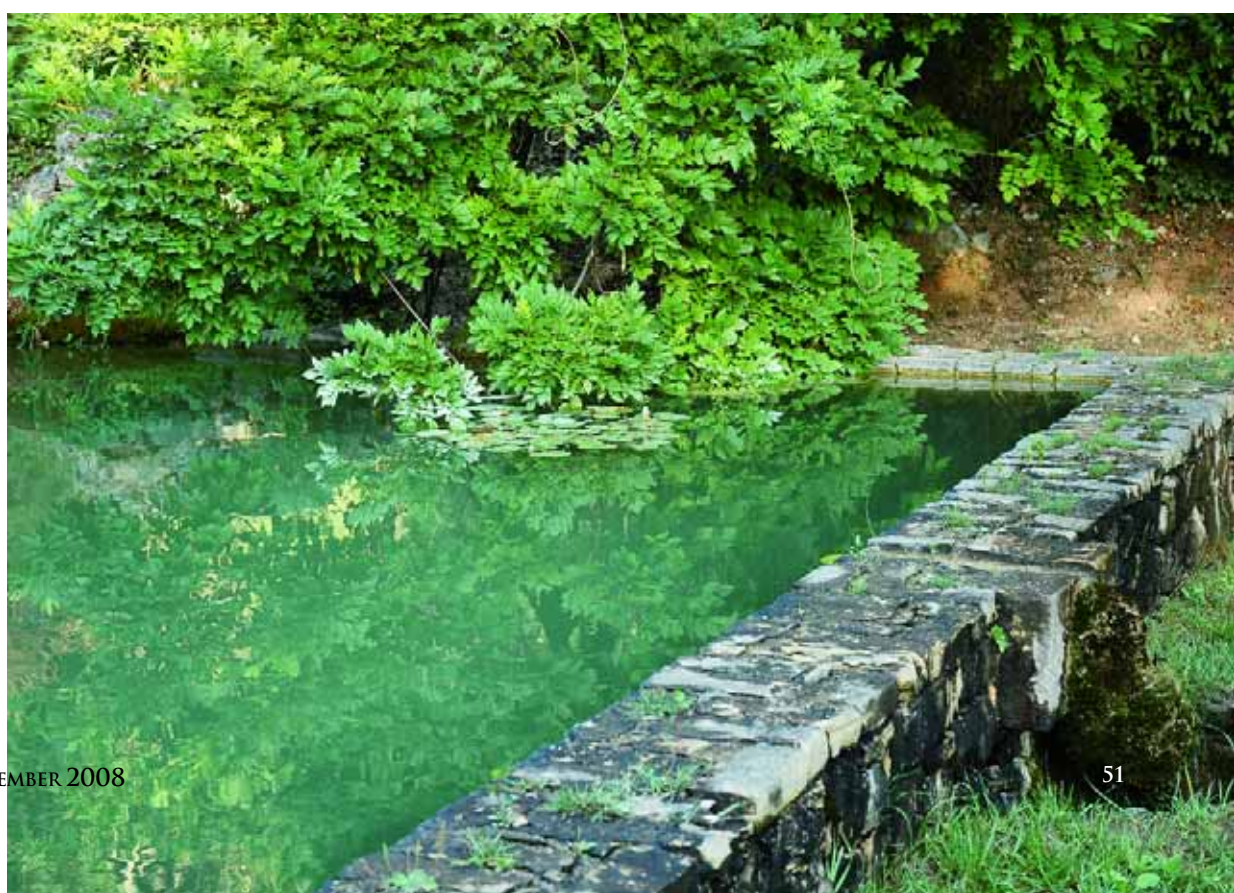
These objects that have been around a long time give us sensations of stability and permanence – valuable commodities in a world full of disposable items and places that aren't meant to last. At the same time, water allows change to mingle with stability: Water lilies, hyacinths and emergent grasses change as they grow, and we get an inkling of the contrasts, even subconsciously, in settings that might seem to be old and unchanging.

This is why old materials that perhaps have been reclaimed from other structures are so powerful when used to construct architectural ponds. By doing so, you pick up on the work nature has done with the passage of time to make a fresh aesthetic statement. And while there are techniques and products that can be used to create that look artificially, to my eyes there is no substitute for the real thing and the subtle, beautiful, entirely random effects of age.

– A.A.W.







Shapes and Settings

When the occasion rises, I've always loved octagonal ponds either set at ground level or raised for seating because of the multiplicity of ways they function in garden spaces. They are wonderfully balanced – geometric and architectural yet soft at the same time – and work particularly well in gardens where paths and planting areas emanate from a center the pond defines.

Rectangular ponds can be wonderful, too, by directing the eye across linear views to a piece of nearby sculpture or off into the distance. Their value may alternatively or conjointly be as reflective surfaces that mirror a home or some other significant structure. Either way, architectural ponds have an amazing ability to link spaces and objects visually that would otherwise seem distant and completely disconnected from one another.

This need for connectedness is yet another reason why, as in all forms of garden design or watershaping, there is a responsibility on the part of the designer to respond appropriately to the setting and the overall environment. With architectural ponds, I'd even argue that there is a *greater* need to be sensitive to the setting than there is with naturalistic ponds.

This is so because, at a minimum, we as designers respond to those two types of ponds very differently. In naturalistic work, we follow the dictates of nature: Although these ponds may exist comfortably in the presence of built environments, they will always be separate from them: Nature rules, no matter what.

That's *not* the case with architectural ponds: As designers, we must respond directly to the architecture of the home or other surrounding structures – an adherence to style that almost always means selecting materials that are the same or very similar to what's already there on site as well as using shapes that echo existing architectural forms. Unless there's some very direct reason to do otherwise, we are constrained within an existing design scheme and by the need to maintain a harmony of materials.

– A.A.W.

Power in Simplicity

I believe that the job of the pond designer is to avoid doing anything that disrupts feelings of tranquility and repose. If the structure containing the water makes too bold a statement or somehow appears out of place, then we run the risk of jarring the person experiencing the water and of compromising or destroying the desired visual and psychological effects.

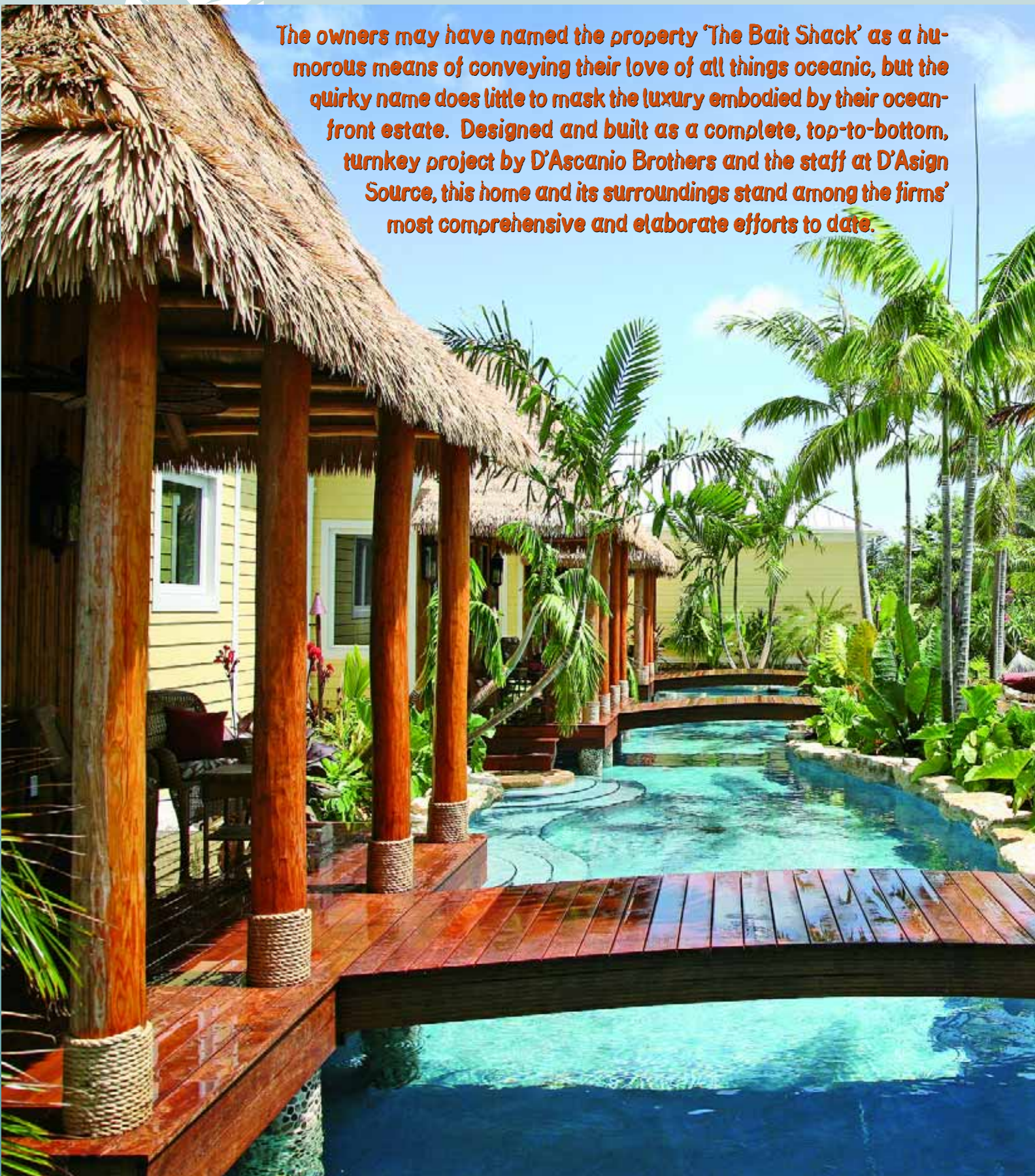
This is an area in which I believe we have much to learn from the traditions of Japanese gardening – despite the fact that our Western approach to architectural ponds may seem at odds with the way Japanese gardeners keep their forms so simple and direct, especially when working in small spaces. Indeed, they won't do anything to upset the meditative quality of a setting, which is precisely where I see a connection to the architectural ponds I admire most.

Look at it this way: Water always forms a confined, dead-level plane and therefore must be precisely placed in the context of any surrounding structures. In effect, we are setting distinct boundaries for a highly reflective sheet of liquid. The materials surrounding the water may be aged or rough-hewn in appearance and the water may be host to ever-changing plant materials, but the plane of the water will always remain precisely the same. As a consequence, there's an advantage to using deliberate, easily understood forms because they create a sense of balance with the unavoidable precision of the water's level.

Organized with care, the container's simple lines can be used to achieve a range of effects, be it tapering, bordering, magnifying or reflecting corresponding shapes in the setting as the situation allows. The principle to remember here is that these lines create a sense of stability that is restful for the eye. In many situations, this plays out simply by keeping the lines of the pond parallel to the shape of an adjacent building or the line created by a line of trees or hedges.

The organization of these primary lines must be congruent with other elements nearby or the effect can be extremely jarring – as would be the case in pointing the corner of a pond at the straight line of a wall. The visual conflict thus created will disrupt any sense of balance and tranquility and invoke the discomfort of instability in exact opposition to Japanese garden philosophy. When there's a picture on a wall that's not hanging properly, we don't see the painting, just the fact that it needs to be straightened!

– A.A.W.



The owners may have named the property 'The Bait Shack' as a humorous means of conveying their love of all things oceanic, but the quirky name does little to mask the luxury embodied by their ocean-front estate. Designed and built as a complete, top-to-bottom, turnkey project by D'Ascanio Brothers and the staff at D'Asign Source, this home and its surroundings stand among the firms' most comprehensive and elaborate efforts to date.

Latitude for Attitude

By Franco D'Ascanio

Unlike most companies that become deeply involved in exterior environments, we at D'Asign Source of Marathon, Fla., are also happy to get involved with our colleagues at D'Ascanio Brothers in designing and building everything else associated with a given property.

When asked by our clients to do so, we tackle it all, from designing and engineering a home and taking care of all the licensing and construction, to furnishing the interiors and providing luxurious details inside and out. And when we're done, we'll happily service and maintain the property for them.

The clients we worked with on the project depicted here are a perfect example of how this works. They had bought another estate we had created and were so happy with the results that they called us in when it was time to assemble their dream home on a large seaside parcel in the Florida Keys.

While not all of our projects are so comprehensive, it's always our preference to take on every aspect of a project for our clients because it gives us the ability to create environments that are clearly integrated into a unified design program. We've also found that there are significant logistical and financial benefits to this kind of arrangement, both for our firm and for our clients.

Walls to Water

In this case, we couldn't have asked for a better situation. First of all, the clients are wonderful people who, through our history together, have become good friends. Second, they're young, fun-loving and can afford everything they might want – and don't mind sharing what they have with family and friends.

Third and perhaps most important, they have a passion for the relaxed, water-oriented lifestyle of the Florida Keys that fits perfectly with our capabilities.

Our involvement with them this time began at the earliest possible point. In fact, we even helped them locate the perfect piece of oceanfront property – at five acres, an unusually large parcel for the Keys. From that point on, our involvement was total as we worked to uncover the possibilities offered by the site and worked with the clients to determine how they intended to use the space.

Right away, they let us know that this was to be their primary residence and was to serve as a base of operations for all sorts of water-related activities – fishing, boating, scuba diving, spear fishing and swimming. It was also destined to be used for entertaining on a large scale, counterbalanced by a similar desire for intimate spaces they could enjoy in private moments. In a nutshell, what they wanted was a Keys-style paradise.

After numerous conversations and site visits, we started working with the primary features, including the main house, a detached guest house complex and a coach house that would serve a variety of utilitarian purposes – mostly as storage space for a variety of aquatic "toys."

We then began mapping out various garden spaces, including a rainforest, a "Jurassic" garden, an exotic fruit garden and more. We also developed plans for an enormous swimming pool, a large pond for fly-fishing, an outdoor entertainment area that would be known as "The Tiki Village" and a structure called "The Bait Shack," which, as its name suggests, was to house tanks filled with live bait along with gear for fishing and diving.

Evidencing the owners' whimsical attitude, they later decided to name the entire estate "The Bait Shack" – humorously ironic, given the lavish nature of the place.

Part of our challenge in all this was figuring out ways to create these disparate functional areas while integrating them all in some sort of coherent design scheme, especially in visual terms. As our work became more specific, of course, we found that this would be no simple task.

The main house has a distinctly Victorian styling that didn't exactly mesh with the relaxed spirit that would mark structures on the rest of the property, but we bridged the gap by repeating soft colors and by using the same wood from the home's porches to create pathways and bridges that play prominent visual roles on the 'Keys side' of the composition.

Take the main house, for example. At about 6,000 square feet, it's not terribly large for an estate of this scope, but it was to have a pronounced Victorian style that wouldn't mesh all that easily with some of the other elements of the project. Helpfully, that style is not uncommon among older homes in the area, so it fit in architecturally, but it isn't a look that immediately lends itself with creating the sort of South Seas atmosphere our clients were interested in conjuring for their guests.

Dual Approach

To make it work, we had to accept the fact that what we were doing would have a split personality: The home and its interiors were to be replete with all sorts of traditional Victorian detailing, while the guest suites and the exterior spaces in general would capture the rustic, island feel.

Once that path was chosen, it was a matter of devising visual transitions that would bring the two approaches together. The solution in this case was to link the guest house to the main house via raised wood decks and bridges over a canal-like portion of the swimming pool. By controlling the pace and visual dimensions of this transition, we managed to bring the two worlds together in a reasonably effective, harmonious way.

For their part, the three suites that make up the guest house are nothing short of idyllic. Inside, they're appointed with gorgeous woodwork and open-air tropical details, and each has access to the pool as well as to a deck cantilevered over the water. Each suite is also connected to a large island reached by the bridges.

That island, surrounded by canal-like arms of the pool and heavily planted with palms and other tropical landscaping native to the south seas , features all sorts of waterfalls, pathways, private seating areas and a variety of lighting and fire effects.

Obviously, a project such as this is an enormous undertaking: On both the design and construction sides, we had to organize our activities as major phases – an approach dictated in part by complex permit requirements as well as strict environmental regulations.

In other words, we may have had a site plan, but we knew that once we were started, it was more than likely that some unforeseen design details would take shape as we rolled along. By phasing the process, we added a measure of flexibility that enabled us to cope with whatever local agencies might toss in our direction.

We began by demolishing an existing house and then scraping the site clean. With the canvas blank, we started on the main house, then moved on to the guest quarters and then the swimming pool, which was to function as a primary, unifying element that would weave its way through a number of different areas.

As the work on the structures and pool moved along, we managed to get to some basic landscaping work, but for the most part we stuck to the phase-by-phase pro-

The three guest suites fully embody the Keys atmosphere, with their rustic porches and appearance over canals of a sort that are common features of the local landscape. Each one has a bridge leading to a palm- and hammock-strewn island and the main pool beyond: Made with Ipé and supported by cast-in-place concrete columns, the graceful spans are meant to conjure memories of other tropical environment in which such bridges are used to traverse lagoons and inland waterways.

gram and worked on "future" phases only when it was both sensible and practical. (Actually, it was hard to resist working on several phases simultaneously, because the clients wanted everything done within an 18-month span. That's a short stretch for a project as complex and detail-oriented as this one, and I'm convinced it would have been impossible had we not done everything ourselves.)

From the first day, the property was a beehive of activity, often with hundreds of craftspeople and workers on site. Even though the lot was big, we were all amazed at how quickly the space filled up with equipment, materials and hard-working bodies.

Digging In

One of the biggest challenges we faced in this project had to do with all the work we did below grade.

The site is located on ancient reef rock covered by about a foot of sandy soil. Coral rock is extremely porous, so, of course, the water table here is quite high. As a result, we began by installing a mass-scale dewatering system and a series of temporary retention ponds made necessary by the fact that you're not allowed to dump the water back into the ocean.

With that system in place, the basic foundation work involved jack-hammering a complex set of trenches and footings that coursed through the entire property. But those were minor tasks compared to swimming pool excavation and making way for a 110,000-gallon cistern to be used for water reclamation and irrigation.

The cistern, which is buried beneath the guest quarters, is an environmental measure made unusually necessary (and valuable) by the scarcity of freshwater resources in the area. Driven by a computer, the system distributes precise amounts of water to the various garden areas, all based on prevailing weather conditions and the defined irrigation needs of different plants.

Digging out such large areas gave us substantial quantities of rocky spoils we used to build up portions of the lot and raise the main house five feet above grade. We also used this excavated material as the underpinnings for a large stone waterfeature at the front of the

When the homeowners and their guests arrive, they're introduced to the property's aquatic themes by a large stone cascade. This waterfall feeds a 150-foot-long stream that eventually flows into a 100-by 80-foot gunite pond stocked with red fish, snapper, puffer fish, tripletail and a few small sharks.

Luxe Details

As mentioned at the start of the accompanying text, The Bait Shack estate incorporates a variety of garden areas. These feature hundreds of plant species including palms and a host of other (mostly) indigenous plants.

Throughout the site, we installed identifying placards (manufactured in-house at our cast-stone manufacturing facility) for key plants, offering their names and origins. The overall sense is that the property is a private arboretum, and we made it work day and night with a grand irrigation system, tasteful landscape lighting and a zoned sound system.

Among the highlights, the entry stream winds through a densely planted tropical rainforest area crossed by paths and outfitted with several small bridges that lead to a number of areas designed for relaxation and contemplation. The lush space includes some 200 species of palms and another 500 species of various tropical plants.

There's also a hummock rich in native plants at the front of the property; a specimen-palm garden adjacent to the guest house that frames an extremely old, rare Cuban palm that was already growing on site; and a "Jurassic" garden encompassing a collection of ancient cycad species, an orchidarium and an exotic garden featuring more than 30 fruits that can be enjoyed right off the trees.

– F.D.

house. Broken coral has a certain charm, but we also imported hundreds of tons of more decorative stone for use throughout the property.

From the start, it was everyone's intention that the pool would provide big fun and dazzle just about anyone who might see it. In many ways the pool is really the heart of the entire design because of the way it links and integrates so many contrasting spaces and the various activities they support.

And it's *big*: At about 220 feet long and 50 feet wide, it boasts 8,000 square feet of surface area and holds 225,000 gallons. Approximately 80 percent of the pool is four feet deep, but there's also an area in front of the grotto that's up to ten feet deep and offers ample opportunities for jumping and diving from various locations.

The idea was to create a backyard pool that would rival what even the best resorts have to offer. We'd even say it surpasses most of those wonderful pools by virtue of the way it embraces the structures and brings the homeowners and their guests right up to the water.

On one side, there's a 200-foot-long leg of the pool that flows by both the main house and the guest quarters. It has the feel of a canal and is therefore typical of waterways found all over the Keys, but it one-ups them by having decks that reach out over the water as well as swim-outs. In addition, we physically linked all of the patio and island features together with tropical-wood bridges to make it, all in all, a wonderful, interconnected place to be.

Zoned for Fun

The long canal ultimately flows into a broad swimming area marked by extensive rock edging, a large beach entrance and a 20-person spa. To one end of this area is the abovementioned grotto, which includes waterfalls, a swim-up area and diving rocks. Adjacent to this area is a large swim-up bar – a key part of the original plan's "Tiki Village" – and a beach entry over near the spa.

The grotto is constructed entirely of natural stone – Fort Myers Cap Rock – chosen to match similar stone we brought in for use around the rest of the property. We suspended the grotto's interior stones on a steel armature, then covered the structure with a concrete shell that served to support the boulders we placed atop the cavern.

The pool is a typical gunite structure, but much of it is raised above the natural grade in order to match the levels set for the main and guest houses. (We used excavated coral rock to bring much of area around the pool up to the new grade.) The pool is finished with a custom quartz product from 3M (St. Paul, Minn.) whose color has been dubbed, appropriately enough, "Bait Shack Blue."

The water is sanitized using a saltwater chlorinator, but unlike most systems of this kind, we decided here to exploit an abundant resource by using filtered seawater to fill and maintain the pool's huge volume.

In keeping with the rest of the property, the pool is functionally divided into a variety of zones. The portion that flows by the main house and guest suites has, as previously suggested, a canal-like appeal and stands ready for swimming, wading or observing the beauty of the pool's island. Over in the main pool area, by contrast, the accent is on more vigorous play as well as group activities courtesy of the spa, the swim-up bar, the grotto, the diving rocks, the beach entry and the volleyball court set up just beyond the beach entrance.

This watershape is so big with so many distinct spaces that the owners have devised an unusual aquatic game in which they and their guests use underwater scooters to race around a course that stretches out for some 500 feet in length. It's all about fun, in other words, and the owners and their guests have taken to all of the available amenities like ducks to water.

The result is an estate of unusual luxury, whimsy and variety. Through it all, our clients were wonderful collaborators who placed a great deal of confidence in our firm by allowing us to make a large number of critical decisions, both technical and aesthetic.

For my part, I've had the pleasure of visiting the property on a social basis on several occasions since we completed our work on site, and I've been thrilled to see how much the clients and their other guests enjoy the various environments. Our firm has executed lots of elaborate projects through the years, but few have reached the level or the sheer fun of The Bait Shack.

The pool is truly the heart of the entire estate's design. Divided into a variety of fun zones – canals, a deep jumping and diving well with a slide, a 20-person spa, a large beach entry, a play area, a grotto and more – the area also includes 'Tiki Village,' a space that includes a large circular swim-up bar with eight underwater stools as well as a host of outdoor cooking/bar amenities and an overhead structure designed to resist hurricane-force winds.

Elegant Intentions

By David Fisherman

From time to time, says David Tisherman, you run into a design in which 'restraint' is the watchword. That was certainly true in this project, where he found an elegant English manor home and has given it a pool that looks as though it's been there for a hundred years. Far less restrained, however, is the structure that holds the watershape in place – and does so without applying any extra pressure to a huge retaining wall that stands just a few feet away.

Sometimes,

the main idea that will drive a design jumps to mind as soon as you see the site.

That was the case with the project covered here: When I pulled up to the gate of the property – high in the affluent hills of Bel Air, Calif. – what I found wasn't a big, showy home of the sort that have increasingly come to characterize the neighborhood; instead, what I saw was a place defined by subtlety and elegance.

It all started with the gate's beautiful brick pilaster, beyond which I could just glimpse a large, lovely home with the distinctive architecture of an English manor house. Even though I hadn't met the clients yet or seen the entire job site, I was already convinced that the project would be a matter of understatement without lots of visual bells and whistles: No vanishing edges, no perimeter overflows – just simple, timeless beauty.

When I met the clients moments later, my thoughts never strayed from the initial impression I'd formed. What I couldn't have anticipated then was that this would also turn out to be a project of profound technical complexity.

At Hello

The clients made an immediate impression, too. He's a successful surgeon, she's a retired business executive, and both are well-educated, well-traveled, keenly intelligent and accomplished. Their home is filled with art and exquisite furnishings – ample evidence of good taste and their cultivated design sensibilities. They were, in short, serious people who seemed to know how to get exactly what they wanted.

But what I also discovered was that they were surprisingly down to earth – less interested in being showy than they were in surrounding themselves with beauty and good design. In fact, unlike most clients I encounter on this level, they wanted to know absolutely *everything* about what I was doing or was going to do and became involved at a level I've seldom witnessed. From the very first moments of our initial discussion, I had the sense that this would be a rare and potentially wonderful collaboration.

Early on, they told me that they had spoken with numerous other pool contractors, many of whom had come through the door claiming to be "designers." They saw through them quickly, however, because the concepts the contractors brought forward were no more than simple parroting of thoughts and suggestions the clients themselves had offered in their conversations.

I responded by letting them know that the process could move in one of two directions: I could start nodding my head, too, and simply give them exactly what they thought they wanted, or I could verbally and visually explain my own ideas about the design based on what I thought the project required.

I spelled it out in those blunt terms because, although they had developed a fairly sophisticated vision of what they wanted, it was clear to me that many of their initial thoughts would not have yielded the desired results. It was a clear case in which they had strong inclinations but

needed a conscientious designer to reshape those concepts into a project that would far exceed their expectations. What they'd encountered before I arrived, they told me, was a whole flock of people without any design credentials at all.

By that point, I had apparently impressed them enough that they were willing to hear me out, so I began offering general thoughts about the yard, how everything should work together and how we needed to manage transitions from one area to the next. I didn't paint myself into any corners by getting too specific: At this point it was more a philosophical discussion than anything else.

Our conversation lasted for about 90 minutes, and when I left, I suggested that they should think things over and that we should speak again when they were ready. They took full advantage of my invitation: Through the next couple of months, we met several dozen times to discuss various design issues and, as important, to define the nature and boundaries of our collaboration.

Traditional Softness

Through all of this, the fundamental idea I'd lit upon the first time I saw the property never left my mind. In a nutshell, that concept had to do with creating a backyard that would look as though it had been built with the house in 1910 as a complement to the home's English-countryside aesthetics.

To that point, nothing that had ever been done in the backyard advanced anything close to such a vision. It wasn't an overwhelming space: The home sits on an acre lot, and the yard in which we were working was about 100 by 140 feet in size. In walking out the back door, we stepped

The gated entrance to the property and a glimpse of the manor house beyond gave me an initial impression that never faltered: I knew immediately that I would be working in understated terms to bring subtlety and elegance to the home's exterior environment. And as it turned out, it was quite a space: a broad, open yard with great views – but also an existing, 15-foot-tall retaining wall that needed respectful treatment.

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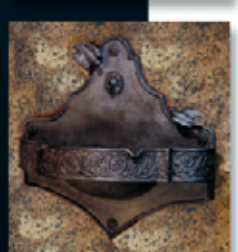

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Special Engineering

One of the most unusual features of the pool described in the accompanying text has to do with the cantilevered deck that extends along the far pool wall. Typically, when a pool has such a deck projecting outward from the top of a pool wall, the deck will run the full length of the wall at the same width and therefore will apply a uniform outward force to that whole wall – which, of course, needs to be engineered to accommodate the added load.

Normally, the added load is not a special problem because a full-length, same-width deck applies the *same* load to every part of the wall, so the tendency of the deck to bend the wall in the outward direction is distributed uniformly. In this case, however, the deck extends at different widths along the pool, which posed us with the problem of preventing the load from acting disproportionately on only one part of the wall.

Failure to develop an engineering solution in this case would cause one portion of the wall to flex outward to an extent different from the rest of the wall – a fact that would likely cause serious cracking at points where the load differential existed.

The solution developed by my friend Mark Smith and his staff at Mark Smith, AIA, of Tarzana, Calif., involved establishing the bond beam along that *entire* side of the pool as a *torsion beam*. What this meant was, instead of having the usual 12-by-12-inch bond beam, we expanded it to 36-by-24 inches and used a specially designed pattern of reinforcing bars that enabled us to spread the beam-twisting deck load along the entire length of the pool.

This had two important results: First, it prevented localized overloading of the pool wall by integrating the strength of the entire length of the wall in resisting the deck load. Second and in turn, we were therefore able to add just a modest amount of extra steel to the entire wall, rather than face the prospect of having to use a great deal of extra steel and concrete in the affected area – an approach that would have increased the likelihood of cracking while also compounding the difficulty of installing the steel and shooting the concrete.

– D.T.

I wish to thank Mark Smith, who participated in the preparation of this sidebar.

onto an upper deck area marked by a hodge-podge array of used brick. Below our feet was a small retaining wall that held back a slope and did nothing by way of offering access or any sense of visual transition.

Beyond the wall was a lower deck made of concrete that dropped about five inches across its 17-foot width. Not only was it pitched with unnecessary steepness, but its main visual features were two large drain grates. In other words, the yard was all about controlling any flow of water, and it was easy to see why this was an issue: The home had originally been built atop a steep slope that flowed down into a canyon, and a long, 15-foot-tall retaining wall had been installed to create a level yard. It was clear that the space's aesthetics had long ago been sacrificed in the name of preserving the wall's integrity.

It was also clear that the wall had been erected without any thought being given to the future addition of a structure as large or heavy as a swimming pool – but more on that below.

The basic design scheme was relatively simple. We would place a 50-by-16-foot rectangular pool about 50 feet away from the house and up close to the retaining wall. The idea was for it to func-

The presence of the retaining wall and the need to set up a structural deck that would span the pool's far wall at different widths led us to use some unusual approaches with the shell. Note the large footing on the retaining-wall side of the pool, for example, which ensures that the pool will place no surcharge on the wall, and the stair-step approach to the spa that makes it a monolithic part of the shell. There's also that huge, 24-by-36-inch bond beam: It's engineered as a torsion beam to distribute the load of the staggered structural deck along the full length of the pool.

tion visually as a reflecting pool that would enhance views of the surrounding trees (already in place), the landscaping we would install later and distant views beyond the canyon.

At one end, there would be a seven-by-nine-foot spa that would be set back by a few feet and connected to the pool via a set of small runnels that would pass beneath capstones and gently spill into the pool. These big watershapes were to be balanced by a small, rectangular fountain at the edge of the upper deck – a structure that would serve an additional purpose by bringing a soft sound to the space near the house. Off to one side, we also plotted out a large outdoor kitchen/dining area.

Linking these destinations, we set up stone pathways, small decks, planting beds, rustic wall details and a host of other touches all directed at making everything seem to be a hundred years old. In this grand composition, the pool was to be visually subordinated to the whole – just another destination away from the house. Our aim was to make each component work as part of a visually integrated, well-appointed, elegant garden space in which plants and stone were the primary focus and the whole would be perceived as subtle, understated and sublimely elegant.

Structural Bones

As we thought things through, we were all aware that the subtlety we were after would completely mask the technical difficulty of what we were pursuing.

As mentioned previously, we were positioning a big pool near the huge retaining wall that gave us a flat place and a large expanse of certified, compacted fill in which to work. We knew in selecting this spot that we couldn't place any surcharge on the wall, which had been designed to support nothing more than the weight of the soil.

In addition, the clients made it clear after I explained the visual issues the

stonework raised that they didn't want to see any expansion joints that would create an obvious frame separating the pool from the surrounding decks. This meant not only that we had to design a benched cantilever to carry the spa and make it part of the monolithic structure, but also that we had to devise and hang cantilevered structural decks from the bond beam.

And there was one more challenge: On the side away from the house, the deck was to extend away from the pool at varying widths, an approach that would impose different levels of stress on the structure. This led to deployment of a specially designed "torsion beam" (explained in some detail in the sidebar on page XX).

All in all, this was a tricky exercise in structural engineering I happily left to the associates of my gifted friend Mark Smith, an architect based in Tarzana, Calif. I always turn to him and his staff when I need sophisticated design solutions; as it turned out, this project involved structural details that proved to be far more advanced than are seen on most pool projects – even those being built on steep hillside lots.

The engineering started in the excavation phase when, on the far side of the pool's floor, we cut a deep footing that reached down past an imaginary 45-degree line extending from the bottom of the far pool wall back to the base of the retaining wall's footing. In doing so, we made certain nothing we would do placed any additional burden on the wall. (The obvious alternative would've been to move the pool away from the wall, but that would've eaten up space we wanted to leave for decks, lawn and garden areas.)

The cantilevered decks also required some unusual forming. We over-excavated around the pool to allow for the large torsion beam and the reinforced-concrete substrate for the stone-covered deck. Into this open space, we extended the steel from the oversized bond beam, passing it through the wood forms. We shot the pool shell up to the forms, then, after removing the wood and battering and roughing up the edges to ensure good mechanical bonding where it was needed, we poured the decks to the thickness required in the structural plans.

Inside the shell, we ran a bench 18 inches below the waterline along the full length of the pool. In the deep end, we added a large notch to be used to step down from the bench into the deep end – a wonderful way to get in and out of deep water comfortably without using ladders and rails. This bench detail served double duty by giving us a chase through which we ran much of our plumbing: This minimized penetrations of the shell and at the same time left the beam free for extra rations of deck- and spa-supporting steel.

It's important to note that the bench and steps were all made of concrete and reinforced steel rather than by excavating their shapes into the soil. We used no rebound at all in shaping these internal features and took great care to make the scale of the bench sufficient to ensure complete shotcrete coverage around the steel and the plumbing lines.

The all-glass-tile spa has a special beauty of its own, with artfully radiused corners throughout; an exquisite, green-toned tile blend I developed using several colors that pick up the mood and colors of the surrounding landscape; and a line of notches for the runnel system that feeds the spillways flowing into the pool.

We used the spa's dam wall in similar ways, exploiting its four-foot thickness as a convenient access point for several main plumbing runs.

Granite Textures

Once we shot the shell and poured the structural decks and gave everything time to properly hydrate and cure, it was time to start working on myriad finish details. (I'm often saddened by the fact that so much sophisticated, top-flight construction work is buried and forgotten, but I always bounce back when we start applying beautiful materials that will bring my clients untold years of enjoyment.)

The primary stone material we used on this project was 16-by-16-by-two-inch blocks of Porphyry, a granite quarried in the Italian Alps and imported in a process that took four or five months. (As a practical point, it's always important in working with imported materials to factor in long delivery times, account for the delays that seem invariably to occur and prepare clients for the wait so they don't become too impatient.)

We chose this material because, at about 100 million years old, it seemed perfectly suited to the task of making the backyard seem at least 100 years old. The material itself is simply gorgeous and, reminiscent of ancient granite curbs and cobbled streets of Europe, evokes Old World charm in every respect possible.

We used a lot of this stone throughout the design as a means of establishing continuity: It's there in the pool coping and on the decks, where we took full advantage of its elegantly chiseled edges; it's also been ledgered to form various steps and pilasters and was used to cap walls and make pathways. (Note that we stayed away from modern-looking cantilevered treads: Instead, we went with a ledgered,

The custom color we developed for the interior finish is a key to creating the impression that this is a reflecting pool that was built with the house nearly a century ago. This green is definitely *not* a standard color, but I've used it and similar hues for years because they offer remarkable backgrounds for reflections – just the effect I was after in this project.

stacked look in all of these details to stick with the old-fashioned appearance we were after. Another old-seeming possibility would have involved using big curbstones, but we elected not to go that way.)

Everywhere we used it, the stone's rough edges and surface textures as well as its remarkable color variations all were perfect for the classic, countrified look we were pursuing.

We also used the stone to create the spillways connecting the spa to the swimming pool. As mentioned above, the spa sits away from the pool by some 40 inches, and the gap is paved in Porphyry. Beneath the stones, we prepared eight three-inch-wide runnels that transmit water to spillways that rise just eight inches above the pool's waterline. This creates an extremely soft, engaging sound of falling water as well as a perfectly balanced visual effect: Had we used a conventional wide-weir approach, the look would have been sacrificed and the flow would have made too much monotonous noise.

From the house, you now move from the upper terrace to the patio and then down one of two sets of steps into the area leading to the pool, the deck and their green surroundings. As always, we were going for subtlety, so we didn't overdo it with the decks. In fact, most of the space between the upper patio and the pool has been left to expanses of lawn slightly interrupted at times by modest Porphyry pathways and low walls crossing swaths of green.

All in the Details

As I've often stated in these pages and elsewhere, it is frequently my objective to use water only as an adjunct to the visual impression made by an overall space. In this instance, it's useful in that context to note that, although the pool, spa and decks required complex engineering and construction, the project is an assemblage of a host of refined details, many of which are well away from the swimming pool.

One of my favorites in this project is another, much-smaller watershape mentioned above: the rectangular fountain basin with a brass bubbler nozzle in its center that sends a short, feathery plume up above the water's surface. The basin is filled with seafoam-green river rocks and sits with its Porphyry coping in a planter at the edge of the patio. As suggested earlier, the fountain flow's soft sound and retiring visuals both forecast and mirror the subtle impression made by the bigger watershapes beyond.

We carried a similarly subtle tone over to the dining area that starts alongside the house and reaches out into the yard. The cooking structure, which includes a grill, refrigerators, a freezer, a pizza oven, side burners and a searing tray, is finished with ledgered Porphyry and has simple lines that show off the texture of the stone.

One of the most interesting details of this outdoor kitchen is what's *not* there: We kept the size of the structure down by eliminating storage cupboards, which I've always seen as a waste of space be-

cause plates and flatware typically go inside for post-meal cleaning. In this case, we set up what little available storage space we had as open cubby holes for wood storage – a visual that adds to the classic look.

Outside the back door on the upper terrace, we picked up a detail from the architecture of the house to inspire seating planters at the base of the six-by-six-inch posts that support part of the home's upper floor. Originally, these posts had tiny bases that made them look spindly and insubstantial. We took some of the old brick from the deck and installed large base planters to strengthen the impression the posts made, laying the brick in an imprecise, rusticated pattern to give everything an Old World feel.

Of all the project details, however, perhaps the most elaborate is the glass-tile finish in the spa. A custom blend of three green colors produced by Sicis of Ravenna, Italy (available in this country through Cactus Stone & Tile of Phoenix), the finish lends a beautiful green color to the water and picks up on the colors of the surrounding landscape. You don't even notice the tile until you're right on top of the spa: Once you peer down into the water, however, you're treated to a shimmering spectacle of dancing colors.

The only craftsperson I allow to touch the glass tile on my projects is Willie Villanueva, the best tile installer I've ever met. His craftsmanship is on full display here, especially in the tiles hugging the rounded edges of the steps and benches.

We could've used quarter-round pieces to accommodate those edges with ease, but that would've created visible lines and disrupted the beautiful appearance of the tile surface. By hand-shaping a two-and-a-half-inch radius on the edges to accommodate the 5/8-inch-square tile pieces, Villanueva was able to wrap the material around the contours to create a seamless finish.

Our effort to create a seamless visual sweep from the home through to the surrounding trees and distant views involved us in much more than just the pool and spa: We picked up on the home's architectures, for example, in building brick surrounds for a series of posts on the upper patio and installed the same Porphyry material we'd used around the pool on that patio and all other walls and deck areas (including the outdoor kitchen) to bring continuity to the entire space. One of the key integrating details is the small, rectangular fountain off the upper deck: It's a marvel of understatement with a bubbler nozzle lending a gentle sound up near the house that forecasts the gentle splashing of the spillways into the rectangular pool beyond.

Green on Green

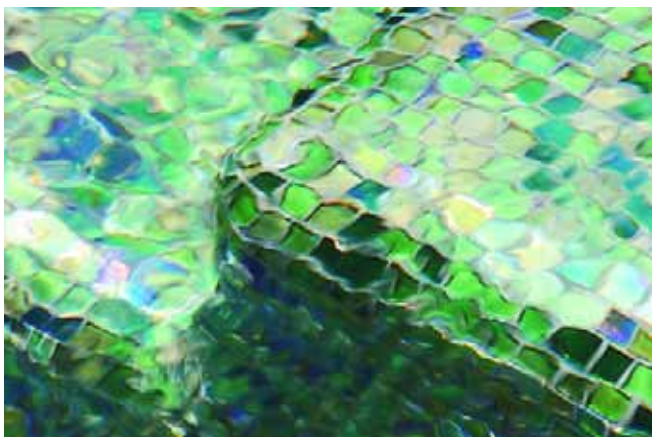
We used the same tile blend in the pool, but only at the waterline. We could have used it on the benches (or on the entire interior surface, for that matter), but ultimately this project was about the look rather than about installing lots of expensive tile: We wanted instead to reinforce the impression that the pool was there primarily for its reflective qualities.

In this case, we decided on a subtle PebbleFina material – an exposed-aggregate product from Pebble Technology of Scottsdale, Ariz. – that would, when polished, look like colored plaster but with significantly less of the mottling found in those finishes.

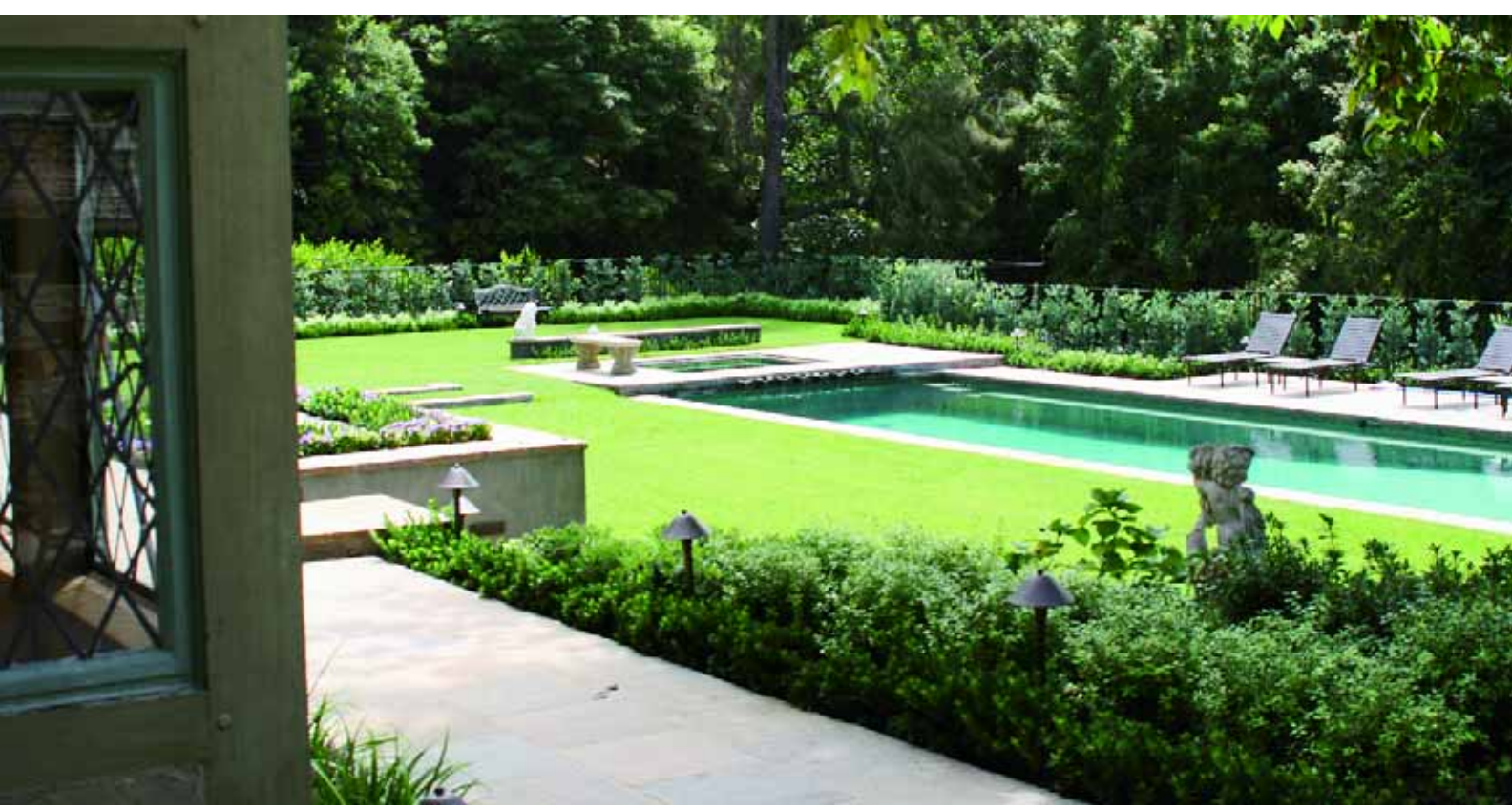
We used a customized green color I developed with the help of John and Luis Marquez of Tony Marquez Pool Plastering (Sun Valley, Calif.). PebbleFina comes in just four colors, and so far as any of us know, no such finish has ever been done with this coloring. We spent a good deal of time experimenting with aggregates and green colorants to achieve the desired look. The result is a soft-green finish that provides a great reflective water surface while harmonizing with the landscaping.

That landscape plan was developed by Kenny Unger of Kenyon Landscape (North Hills, Calif.). He did a brilliant job of devising a formal English garden of the sort found around many of the classic manor homes dating to the 16th and 17th centuries. There's an artful geometry to the arrangement of spaces, along with wonderful variations of color and texture as well as impeccable attention to detail.

By the time we all finished our work, the clients' expectations had indeed been exceeded and they'd been given exactly what they desired even though, at the start, this wasn't precisely what they had in mind. From my perspective, the special nature of the collaboration (and, of course, the beautiful outcome) makes this project stand as one of my favorites: Absolutely everything came together – water, stone, plants, hardscape – to create a singular, subtle garden experience in a place that truly looks and feels as though it's been there at least 100 years.



From any distance at all, the pool seems for all the world to have been built along with the house a long time ago. The rich texture and appearance of the Porphyry, the elegance of the formal gardens, the selection of classic garden art and accent pieces – everything works together to create the impression I'd envisioned when I arrived at the property for the very first time. When you get up close to the pool and spa, the sense of age is compounded by the timeless beauty of the glass tile and the rough-hewn quality of the slightly cantilevered spillways.



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GENESIS 3 DESIGN GROUP

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GENESIS 3 - THE INTERNATIONAL FORUM FOR CONTINUING EDUCATION FOR WATERSHAPE DESIGNERS AND CONTRACTORS

Circle **16** *on Postage Free Card*

Of Interest

The following information has been provided to WaterShapes by product suppliers. To find out how to contact these companies, look for the Product Information Card located on page 76.

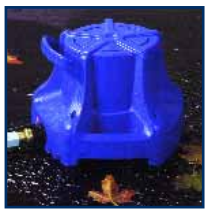
Vinyl-Liner Step Track

Circle 135 on Reader Service Card

CARDINAL POOL SYSTEMS offers a liner track that makes vinyl-covered steps and benches fit perfectly on every installation. The track is bent and bolted between each step tread and riser, eliminating the need for step rod and its clips and pockets. A simple vinyl bead welded to the back of the liner then snaps into the track, which can be made to conform to any shape or size. **Cardinal Pool Systems**, Schuylkill Haven, PA.

Pool-Cover Pump

Circle 136 on Reader Service Card



LITTLE GIANT PUMP CO. offers the APCP-1700 pool-cover pump. Designed to drain water from pool covers at a rate of 1,700 gallons per hour, the unit activates in two inches of water and features a 25-foot power cord, an integrated handle for easy portability, a wide base for stability and a mechanical float. The energy-efficient motor has a maximum lift to 21-1/2 feet. **Little Giant Pump Co.**, Oklahoma City, OK.

Tile/Vinyl Cleaner

Circle 137 on Reader Service Card

SEAKLEAR has introduced Thick Tile & Vinyl Cleaner for use in pools and spas. Designed to remove film, oil and scum lines from tile and grout as well as the tile borders on vinyl liners, the product is non-abrasive but cleans deep down into pores to remove tough soils. It comes in a one-quart container and is safe for use on acrylic surfaces, making it ideal for taking care of portable spas. **SeaKlear**, Bothell, WA.

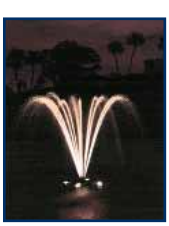
Wireless Control

Circle 138 on Reader Service Card

ADVANCED CONTROL LOGIX has introduced WebLogix, a wireless Internet communications interface that allows full bi-directional communication with its line of chemical controllers. The communication module allows chemical controllers to be viewed and programmed wirelessly via the Internet, and each module has the capability of providing communications for four pools. **Advanced Control Logix**, Colfax, CA.

Fountain Systems

Circle 139 on Reader Service Card



AQUA CONTROL has introduced the Evolution Series Fountain. Designed to produce impressive spray patterns at a low operating cost, the easy-to-install unit offers six spray patterns and can be plugged into a standard 115-volt receptacle. It comes with either a 100- or 175-foot cord, 100 feet of mooring rope, two mooring stakes and a timer/photo sensor; optional LED lighting is available. **Aqua Control**, Spring Valley, IL.

Heavy-Duty Pumps

Circle 140 on Reader Service Card

PENTAIR COMMERCIAL POOL & AQUATICS offers the C-Series of high-performance pumps. Designed for commercial and large residential pools as well as fountains and water attractions that demand high flow rates and continuous operation, the pumps' all-bronze construction provides long-lasting strength and durability in single and three-phase models. **Pentair Commercial Pool & Aquatics**, Sanford, NC.

Step Lights

Circle 141 on Reader Service Card

ORBIT/EVERGREEN has introduced a line of 12- and 120-volt LED step lights for outdoor walkways, steps, decks and patios. Designed for versatility and style, the fixtures are offered in a range of models, sizes, finishes and cover-plate options to complement all architectural designs. They come in horizontal, circular or vertical configurations with louvered, hooded or frosted-glass faces. **Orbit/Evergreen**, Los Angeles, CA.

Travertine Collection

Circle 142 on Reader Service Card

CACTUS STONE & TILE offers the Torreon Collection of filled and tumbled Travertine. The color-matched materials are intended for various uses in a project, with pool copings at 12 or 24 by 14 inches with 3-inch thickness; pavers at 6 or 12 by 12 inches with 1-3/16-inch thickness; and tiles at 16 by 24 inches and 1/2-inch thickness – all in a consistent Desert Cream color. **Cactus Stone & Tile**, Phoenix, AZ.

Outdoor-Kitchen Fixtures

Circle 143 on Reader Service Card

CALISE OUTDOOR KITCHENS offers the Modular Island System to simplify the process of selecting, designing and installing features and fixtures for outdoor kitchens. The system includes a wide variety of stainless steel cabinets, bars and grills in shapes and sizes that work together in any of up to 1.9 million configurations that include refrigerators, storage units, sinks and much more. **Calise Outdoor Kitchens**, Las Vegas, NV.

Surface Materials

Circle 144 on Reader Service Card

NATIONAL POOL TILE provides a complete array of decking, stone and tile materials to integrate the looks of decks, pools and patios. Collected to enable designers and builders to weave outdoor spaces seamlessly into one another, all of the materials – quartzite, Travertine and more – are durable, acid-proof and slip-resistant and come in a range of colors and surface appearances. **National Pool Tile**, Anaheim, CA.

Paver Drains

Circle 145 on Reader Service Card

QUAKER PLASTIC now offers its paver drains in both tan and gray colors to match more design choices. The 2-3/8-inch-tall units are made specifically for use with standard pavers and require no cutting or adjustment. They are held in place by securing clips that reach under the pavers and can be alternated from side to side or all placed on one side to fit flush against a wall or building. **Quaker Plastic**, Mountville, PA.

Site-Access System

Circle 146 on Reader Service Card

FRANK WALL ENTERPRISES has introduced DuraDeck, a mat system designed to provide jobsite access to builders while protecting turf from damage. The high-density polyethylene mats can be placed over marshy terrain, mud, sand and other soft surfaces for access and traction to create an instant roadway over virtually any type of ground and will not warp, rot, crack or delaminate. **Frank Wall Enterprises**, Columbus, MS.

Continued on page 80

Concrete Sealer

Circle 147 on Reader Service Card

DECK-O-SEAL offers Deck-O-Grip W/B, a non-yellowing, water-based, blended, polymer-based, high-solids sealer for decorative concrete. The product is clear, transparent, easy to apply and cures to form a hard yet flexible film. It also provides improved chemical resistance when compared to standard acrylic-only curing and sealing compounds and results in a slip-resistant surface. **Deck-O-Seal**, Hampshire, IL.

Rubber Liners

Circle 148 on Reader Service Card

FIRESTONE SPECIALTY PRODUCTS offers PondGard rubber liners. Flexible and easily shaped, the fish- and plant-friendly material works in ponds, streams, watergardens and waterfalls and comes in a variety of sizes and lengths. It is also resistant to ultraviolet exposure, ozone, frost, snow and temperature extremes and resists microbial attacks and algae growth. **Firestone Specialty Products**, Indianapolis, IN.

Classic Stone

Circle 149 on Reader Service Card

YELLOW MOUNTAIN STONEWORKS offers custom architectural and landscape stone. Materials include antique granite, limestone and sandstone salvaged and reclaimed in China as well as newly quarried dimensional stone finished in a range of textures and finishes – honed, polished bush-hammered, cleft, flamed and more, either hand-tooled or done with machines. **Yellow Mountain Stoneworks**, Seattle, WA.

pH Controller

Circle 150 on Reader Service Card

CAT CONTROLLERS offers the CAT 1000, a digital controller that constantly monitors and automatically corrects pH. Designed for use in residential pools, the system is a perfect complement to salt chlorine generators, protecting plaster and aggregate finishes while easing chemical maintenance. The unit comes with either a CO2 kit or a peristaltic acid pump and tank system. **CAT Controllers**, Rockville, MD.

Water Effects

Circle 151 on Reader Service Card

PENTAIR WATER POOL & SPA offers MagicFalls Water Effects in five different forms: with waterfalls in sheet, curtain or rain style; and as arcs in sheet or rain form. Each is available in six finishes (brass, bronze, copper, gray, silver or white) and in ten widths from 8 inches to 8 feet. In addition, some sizes can be factory-cut to a concave or convex radius or custom curves. **Pentair Water Pool & Spa**, Sanford, NC.

Decking-Product Catalog

Circle 152 on Reader Service Card

TIMBERTECH has published a catalog covering its line of wood-composite decking and railing systems. The 24-page, full-color booklet includes information on an array of decking profiles, color options and textures; docking planks; two railing systems available in an array of colors that complement decking choices; a deck-drain system; and a variety of accessories including fascias, risers and end caps. **TimberTech**, Wilmington, OH.

Continued on page 82

Of Interest

Glass-Tile Collection

Circle 153 on Reader Service Card

OCEANSIDE GLASSTILE has added several new options to its Casa California collection. A silken matte finish is now available along with the line's iridescent and translucent non-iridescent finishes, and there are three new colors: cool gray, cinnamon and chocolate. Made using recycled materials, the handcrafted collection also includes an extensive selection of trim pieces. **Oceanside Glasstile**, Carlsbad, CA.

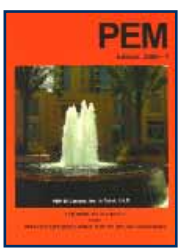
Sterilizer Ballasts

Circle 154 on Reader Service Card

EMPEROR AQUATICS has introduced Smart Ballast. Designed to deliver precise input wattages to lamps in ultraviolet sterilizers, the device maximizes UV-C output, lengthens lamp life and can be positioned well away from the sterilizer housing for added safety using its 19-1/2-foot power cord. The system is also watertight and resists damage in the event of a quartz-sleeve failure. **Emperor Aquatics**, Pottstown, PA.

Fountain Catalog

Circle 155 on Reader Service Card



PEM FOUNTAIN has published information on its line of fountain, water-display and fountain-pond products. The 235-page catalog covers new products, water switches, jumping, spray and laminar jets, lighting fixtures, wiring devices, fountain controls, pond and pump fittings, projection-screen jets and flow straighteners as well as illustrations and current technical information. **PEM Fountain**, Richmond Hill, Ontario, Canada.

Terrain-Friendly Software

Circle 156 on Reader Service Card

STRUCTURE STUDIOS has released a Terrain Update for its Pool Studio design software. This update enables designers to create multiple, sloping hills and upright arcs in realistic three-dimensional representations and topographical maps in two dimensions. It also allows for rotation and scaling of materials to offer clients multiple product options – all set amid true-to-life landscaping. **Structure Studios**, Las Vegas, NV.

Commercial Pool Heater

Circle 157 on Reader Service Card

LOCHINVAR offers Copper-Fin^2, a gas heater for commercial pool applications. Available in models ranging from 500,000 to 2,070,000 Btus per hour with thermal efficiency ratings up to 89 percent, all units are designed for high efficiency in a space-saving configuration. They also exceed the toughest NO_X emissions requirements, with a rating of less than 30 parts per million. **Lochinvar**, Lebanon, TN.

Pool-Finish Brochure

Circle 158 on Reader Service Card

CL INDUSTRIES has published literature on SunStone Pearl, a pool finish in which small pebble aggregates are blended with pigmented, color-fast white Portland cement to produce a durable stain-, wear- and chemical-resistant surface. The six-page, full-color gatefold brochure shows seven color options (both dry and under the water) and highlights the availability of custom color blends. **CL Industries**, Orlando, FL.

Fountain Lighting

Circle 159 on Reader Service Card

OTTERBINE BAREBO has introduced its Fountain-Glo Par 64 Lighting System. Designed to illuminate large, impressive fountain-jet patterns vertically as well as horizontally without being too complicated to install or maintain, the fixtures operate on 115-volt service and feature two-light sets that produce 2,000 watts of power and over 38,000 lumens with bulb lives exceeding 4,000 hours. **Otterbine Barebo**, Emmaus, PA.

Ozone Generators

Circle 160 on Reader Service Card

DEL OZONE offers the Eclipse Series of corona-discharge ozone generators. Easy to install, retrofittable, reliable, energy efficient and non-polluting, the systems produce no chemical byproducts and are designed for use in the circulation systems of swimming pools with capacities from 7,000 to 25,000 gallons (as the primary system) and from 15,000 to 100,000 gallons (as supplemental systems). **DEL Ozone**, San Luis Obispo, CA.

In-Pool Bench

Circle 161 on Reader Service Card

FOX POOL has introduced an in-pool bench to complement its pool packages. Designed to follow the straight or radiused contours of the pool wall for a seamless look, the bench becomes an integral part of the pool to ensure structural integrity while requiring less space to build than features that protrude outside the pool wall. Each bench also comes pre-plumbed with three hydrotherapy jets. **Fox Pool**, York, PA.

Coping for Fiberglass Pools

Circle 162 on Reader Service Card

VASTEC USA offers a flexible, powder-coated aluminum coping for use with fiberglass pools. Designed as an easy-to-use, faster-to-install alternative to coping made with styrofoam cantilever deck forms, the product is available in white, tan or gray, is fully compatible with tile, pavers and fiberoptic lighting systems and withstands the challenges posed by salt-chlorine generators. **Vastec USA**, Dagsboro, DE.

Pond Skimmer/Fountain

Circle 163 on Reader Service Card

EASYPRO POND PRODUCTS has introduced a floating skimmer that doubles as a pond fountain – a combined functionality that keeps small ponds clear of surface debris while providing a decorative accent. A submersible pump draws water from the surface, down through a removable strainer basket and three foam filter pads. The water is then returned through the fountain nozzle. **EasyPro Pond Products**, Grant, MI.

Pool Enclosures

Circle 164 on Reader Service Card

CCSI INT'L offers the Garden Prairie line of pool enclosures as eco-friendly, energy-saving options for pool projects. Featuring insulated, light-transmitting polycarbonate roof glazing for solar-energy retention, the structures assist in keeping pool water at desired temperatures, reduce cleaning time, limit wind- and sun-related evaporation and help minimize chemical consumption. **CCSI Int'l**, Garden Prairie, IL.

Continued on page 84

Automatic Pool Cleaner

Circle 165 on Reader Service Card

AQUA PRODUCTS offers the Aquabot Turbo T-Jet, a self-contained, self-propelled pool cleaner that consumes minimal energy and significantly reduces pool filter maintenance. Featuring a 5,100-gallon-per-hour pump and reusable filter bag, the unit captures 23 quarts of dirt and debris from palm leaves and rocks to silt and algae down to two microns – keeping it out of the filtration system. **Aqua Products**, Cedar Grove, NJ.

Aerator Catalog

Circle 167 on Reader Service Card

AQUAMASTER has published a catalog on its line of water-quality-management products. Designed to relieve problems with algae build-up, aquatic weeds, bottom sludge, foul odors, insect infestations and stagnation in lakes and ponds, the aerators covered in the 24-page, full-color booklet range from 1/3 to 25 horsepower and come in dozens of spray patterns – some reaching to 96 feet. **AquaMaster**, Kiel, WI.

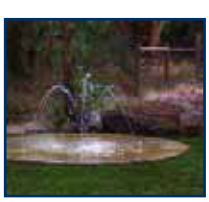
Compact Excavator

Circle 169 on Reader Service Card

BOBCAT has introduced the Model 418 compact excavator. Designed for use in unusually tight working areas with an access-width requirement of just 28 inches, the lightweight, joystick-controlled unit has a dig depth of six feet and operates with no tail swing or overhang, thus allowing the operator to optimize spoil placement and minimize machine contact with structures and other nearby objects. **Bobcat**, West Fargo, ND.

Residential Spray Pad

Circle 170 on Reader Service Card



S.R. SMITH has introduced WetDek, a zero-depth residential spray-pad system available in 6-, 9- and 12-jet configurations. Designed for new construction or as an add-on, the system is packaged either as a kit for integration into a pool's circulation system or as a stand-alone feature. Both options include a programmable 4-channel controller that enables the user to customize waterplay configurations. **S.R. Smith**, Canby, OR.

Dancing-Water Controller

Circle 166 on Reader Service Card

CRYSTAL FOUNTAINS offers ChoreoSwitch, which combines with the company's submersible LED lighting arrays to make it easy to create exciting interactive water effects for splash parks as well as residential play areas. The control system can be programmed to produce effects that change at up to 10 times per second and, when lit, can be used day and night. **Crystal Fountains**, Toronto, Ontario, Canada.

Deck Lighting

Circle 168 on Reader Service Card

HADCO offers literature on its line of low-voltage deck-lighting fixtures. The two-page, full-color sheet depicts products available in a variety of materials, styles and finishes including copper, steel, brass, bronze and powder-coated black, white and green. Designed variously for applications on posts, walls or steps, all units come with a lamp, six feet of 18-gauge wire and a low-voltage connector. **Hadco**, Littlestown, PA.

Floor/Deck Surfacing

Circle 171 on Reader Service Card

NATARE offers NataDek, a surface finish designed for applications in wet areas around swimming pools and in waterparks or other waterplay areas. Made of a specially formulated PVC/polyester composite, the slip- and fade-resistant material can be used in new installations or over old concrete, ceramic tile, wood or plaster floors and is available in a wide variety of standard and custom colors. **Natare**, Indianapolis, IN.

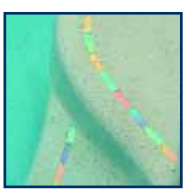
Pool Pumps

Circle 172 on Reader Service Card

A.O. SMITH offers two-speed motors for swimming pool pumps. Designed to run quieter, cooler and more efficiently, units operate at two different speeds to suit various water-circulation applications while consuming between 20 and 45 percent less energy than single-speed pumps. The motors are available in a range of horsepowers and frame configurations to suit a variety of system needs. **A.O. Smith**, Tipp City, OH.

Tile Accents

Circle 173 on Reader Service Card



PEBBLE TECHNOLOGY is rolling out its Finishing Touches Tile Collection in several markets. Available in three families – the Shoreline, Gemz and Geometric Collections – the materials include porcelain and glass tile in various styles that are designed to bring splashes of brilliance, color and sheen to the waterlines, floors, steps and seating areas of pebble-finished pools and spas. **Pebble Technology**, Scottsdale, AZ.

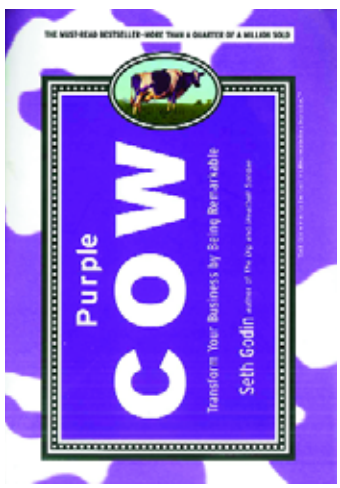
Tree-Protection Systems

Circle 174 on Reader Service Card

NEENAH FOUNDRY has published a catalog on its line of cast-iron tree grates and guards. The 24-page booklet covers ten styles of tree grates in range of sizes and a number of square, rectangular and circular configurations along with some one-of-a-kind products. There's also information on fabricated tree guards along with tips on tree planting, pedestrian safety and grate installation. **Neenah Foundry**, Neenah, WI.

By Mike Farley

The Color of Uniqueness



As 2008 draws to a close, it's apparent that we are contending with a far more challenging marketplace than we enjoyed just a couple years ago. Current economic woes have cut deeply into bottom lines, forced some watershapers out of business and prompted many others to seek out ways to maximize the business and referrals that come their way.

With this challenging business landscape in mind, I recently picked up a copy of Seth Godin's *Purple Cow: Transform Your Business by Being Remarkable* (Penguin Group, 2002). Godin, the best-selling author of 10 books, is well-known for challenging the conventional thinking that constrains many businesses. Although this particular book was written before the recent downturn in the world and U.S. economies, his message in this easily read 150-page discussion is quite applicable to today's situation – particularly among watershapers who want to enhance their approach to the business.

Godin's discussion starts out with an account of a trip to the French countryside, during which he was transported by the stunning beauty of the landscape and by the cows scattered over the hills and fields. Although those cows made a strong first impression, he writes, they all started to look the same after about five minutes – an observation that introduces his assertion that to be successful in business you must be remarkable and stand out from the crowd.

In today's marketplace, he explains, there are a great many people who do a good job and are relatively succesful by being predictable (even bland) and by rarely straying beyond their comfort zones. To be truly successful, he continues, we need to vest our products, services and ourselves with qualities that are unique.

Godin concedes that this is much easier said than done: Many of us fear doing the remarkable because we don't want to risk failure and don't want to buck educations that taught us from childhood to conform and "stand in line." To overcome those fears, step up and expand our horizons, he says, we need to take risks and stop fearing failure.

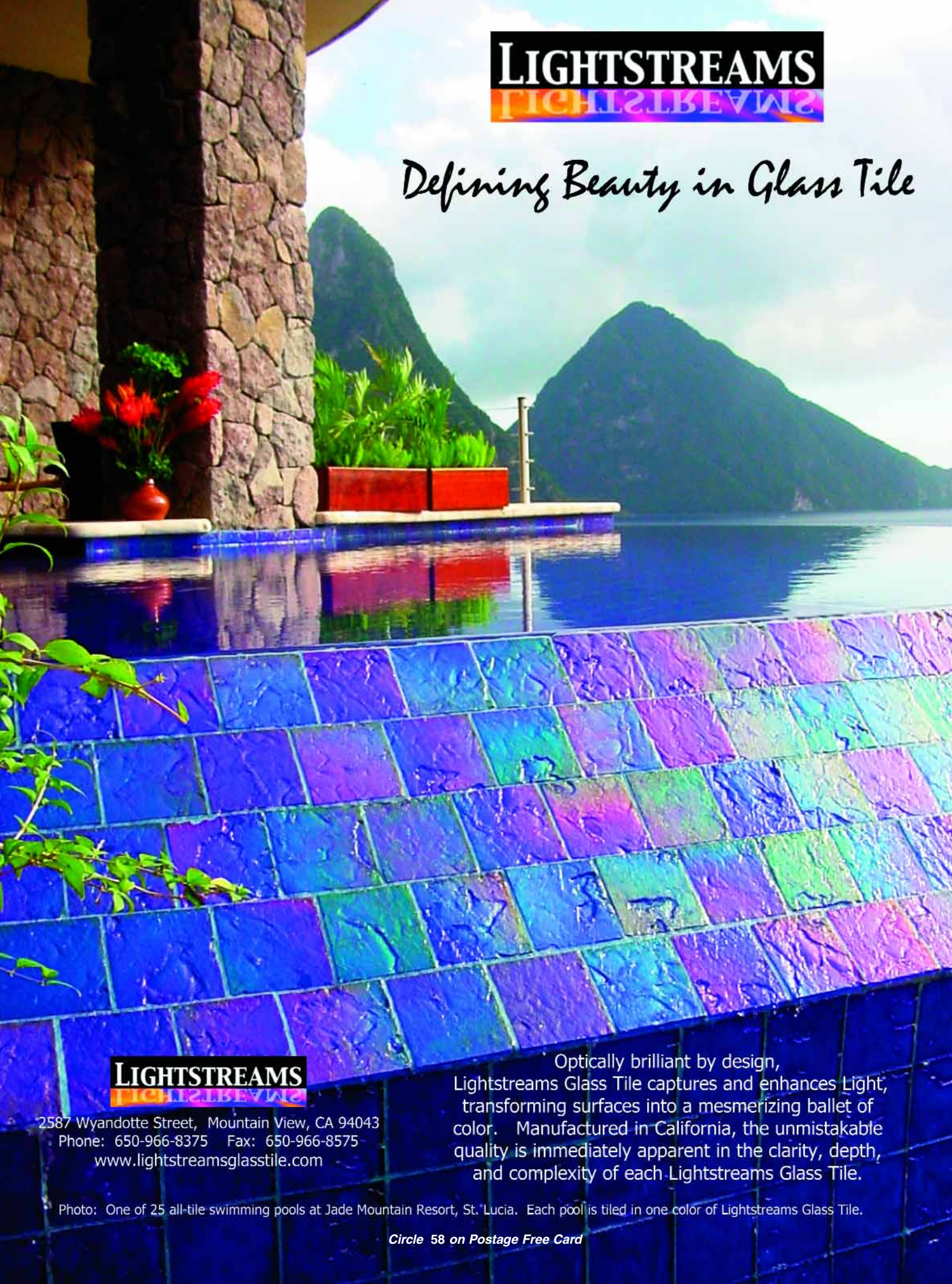
Those who *do* take chances – and, as important, who constantly strive to expand their knowledge and skills and continuously pursue education – will, he says, have a better chance of expanding their businesses and remaining successful through good times and bad.

In all of this, he says, there's a further challenge that comes from our tendency in upswings to stay the course because we're happy with the success we're having and don't want to stray from what's working. Conversely, when markets soften we're similarly reluctant to step out and try new things because economic pressure increases our fear of failure and sense of vulnerability. The result, he laments, is that too few people are *ever* willing to be remarkable.

In applying what I read to our industry, I can't think of a more apt analysis: The watershapers I know who've taken chances by making pool interiors red or suggesting deluxe materials (or staging any of a hundred other innovative leaps designers have put on display in *WaterShapes*) are those who are still thriving in the current market. Those who have relied on production-oriented approaches are, by contrast, suffering greatly.

Although Godin doesn't mention our industry in his anecdotes, we are nonetheless operating within a model that perfectly makes his case. As I see it, his book offers a reasonable admonition to us to stretch our boundaries; work referrals that arise from being creative and quality oriented; seek education; and, essentially, figure out ways to become the purple cow who stands out from all the rest. 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.



LIGHTSTREAMS

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Optically brilliant by design, Lightstreams Glass Tile captures and enhances Light, transforming surfaces into a mesmerizing ballet of color. Manufactured in California, the unmistakable quality is immediately apparent in the clarity, depth, and complexity of each Lightstreams Glass Tile.

Photo: One of 25 all-tile swimming pools at Jade Mountain Resort, St. Lucia. Each pool is tiled in one color of Lightstreams Glass Tile.

Circle **58** *on Postage Free Card*

Jandy

- Pumps
- Filters
- Heaters
- Heat Pumps
- Controls
- Lights
- Water Purification
- Valves
- Water Features
- Water Leveling
- Cleaners
- Pool Covers
- Accessories

ALL JANDY PRODUCTS WORK SEAMLESSLY TOGETHER

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Optimizes energy use by automatically adjusting equipment programs and schedules based on seasonal needs. This feature eliminates the need to manually change programs when outdoor temperatures typically change. It knows what to do before you do!

Smart Variable Speed Pump Interface

Manage most brands of variable speed pumps, allowing programming of up to eight speeds, for optimum filtration and significant energy savings.

Save Water with Sprinkler Control

Jandy offers control of sprinkler systems, programming up to eight valves with multiple on/off times and easy override features including automatic season adjust from the OneTouch controller.

Automates Lighting

Smart light interface allows control of color lighting and "set it and forget it" features from the OneTouch screen.

energy smart products