

Inside: Mark Holden on Aquatic Safety

WATER SHAPES

Design • Engineering • Construction

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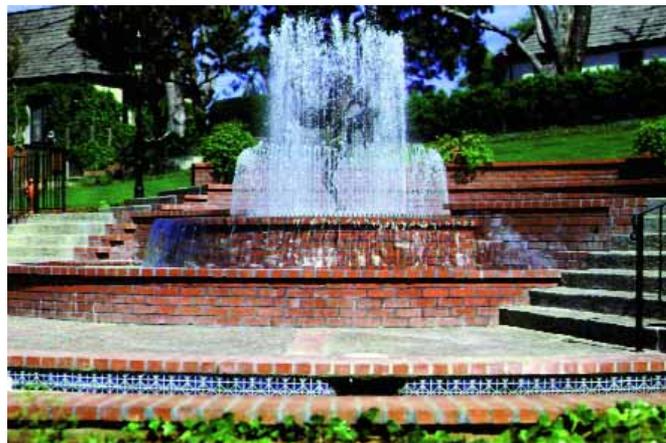
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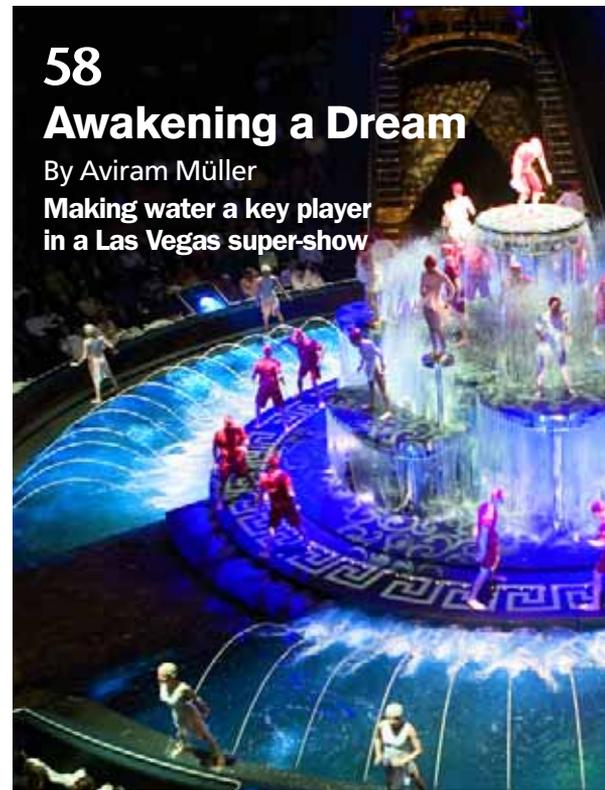


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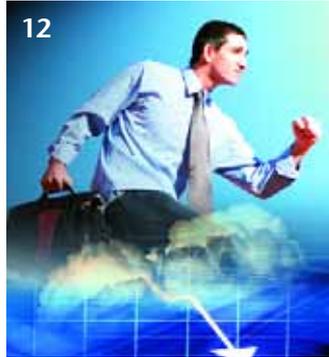
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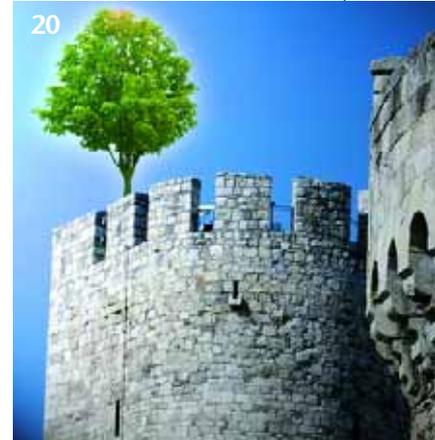
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Photo by Tomek Rossa, courtesy Aviram Müller, Karajaal, St. Sauveur, Quebec, Canada.

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By Eric Herman

To Better Days!

I imagine that many of you said “good riddance” instead of “farewell” to 2008 – and that almost as many of you might want to skip right over the looming uncertainty of 2009 completely and head directly into 2010.

Nobody can jump ahead in time like that, of course, which leaves us in the here and now to decide how to proceed through our current economic predicaments as individuals, companies and nations. Speaking for myself, my plan is to call on my reserves of native optimism and to face the coming year without fear or abiding worry about conditions that are beyond my control. To do otherwise is to invite sleepless nights in place of much-needed energy and hope.

Fact is, most of us have been around long enough to know that economies swing on pendulums between booms and busts and that we have no choice but to make things work until conditions start swinging our way. In the meantime, there’s a commonsense need to recognize that, as things change, the surest path to survival (and eventual success) involves finding ways to keep moving forward.

On the bright side, I’ve spoken with enough people to know that the demand for watershapes of all sorts has seldom been stronger – but that it has proved for months now to be almost impossible for interested consumers to find the financing that is so often needed to turn dreams into reality. The messages aging Baby Boomers continue to hear about the fantastic health benefits of swimming and hydrotherapy will eventually rekindle the pool and spa market, just as certainly as the increasing awareness of the glories of watergardening will endure right through hard times and ultimately carry us to a time when pent-up demand will be unleashed upon watershapers everywhere.

We should also be mindful of the fact that, despite the grim news, lots of watershapes continue to be commissioned, designed and built. Even during hard times, affluent people buy beautiful homes and adorn them with custom enhancements including pools, spas, fountains, ponds and streams. Indeed, I’ve spoken with many watershapers who have seen no fall-off at all in their businesses and are in fact just as busy as ever – if not more so.

It is in this phenomenon that I find the ultimate reason for optimism.

As I see it, the persistence of activity through these troubled times is an immense tribute to the ever-more creative and dynamic projects watershapers have generated through the past decade – and that this achievement, this uplifting of watershapes from mere commodities to custom treasures, is ultimately what will pull us through and should be driving a shared optimism about the future.

As a result of creative expansion, the watershapes market has far greater value than it once did. Through your own efforts you’ve set the table for success, and even if current conditions have temporarily scattered the flatware, there is little to undermine the progress that has been made. Consumers mostly want what they see, and you’ve given the world enough to look at and desire for years to come.

Here’s to a better 2009: It’s in all of us to get through it, and to do so with confidence and style.



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James Atlas is co-principle of Platinum Poolcare Aquatech, a full-service pool design, construction and service firm serving upscale residential clients in the greater Chicago area from a base in Wheeling, Ill. The son of widely known pool builder and industry pioneer Ron Atlas, James has been involved in the pool-construction business since childhood. He attended the University of Colorado at Boulder, graduating with a bachelors degree from the business school in 1991. He worked as an options trader at the Chicago Board of Exchange for three years before rejoining the pool industry in 1994. After that, he soon applied his entrepreneurial skills to form Fountain Technology, a firm focused on commercial waterfeatures, and Pool Watch, a commercial pool maintenance/aquatic services company. He eventually rejoined his father's firm and worked as an estimator for large commercial projects. Recognizing a void in the area's custom pool design/construction market, he formed Platinum Aquatech in 2003 to serve upscale residential clients and merged it with another firm, Poolcare Specialty, in January 2008.

Ed Beaulieu is chief sustainability officer at Aquascape of St. Charles, Ill. – a role that has seen him install custom waterfeatures from small ponds to large lakes and commercial waterfeatures. He holds a bachelor's degree in zoology/limnology as well as a master's degree in marine biology. Now focusing on sustainability, Beaulieu incorporates water quality, storage and habitat considerations into custom landscape designs that have been featured in such publications as *Architectural Digest*, *Better Homes & Gardens*, *Nature's Garden* and *Irrigation & Green Industry News*, among others. He has been project manager for the company's waterfeature installations at the Flower & Garden Festival at Disney's Epcot Center in Orlando, Fla., for the past six years and has also appeared on various shows on the HGTV and D.I.Y. channels.

Aviram Müller is the founder of Karajaal, a water-experience company based in St.-Sauveur, Quebec, Canada, that focuses on the design and engineering of distinctly interactive aquatic venues in which water, lighting effects, fountains and pools are typically part



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of the package. A multi-faceted artist with an extensive technical background, Müller has worked on three continents through the past 25 years. He has a passion for creating distinct, affordable and ecologically responsible experiences, with a focus on commercial centers and resorts. He is currently working on a textbook on the subject of sculpting with water that will be aimed at university students and graduates in architecture, engineering and the fine arts.

Once each year in January, we provide fuller biographies of our columnists:

Brian Van Bower operates Aquatic Consultants in Miami and is a co-founder of the Genesis 3 Design Group. With more than 35 years' experience in the swimming pool and spa industry, he now specializes in the design of swimming pools, recreational areas and hydrotherapy clinics. As a consultant, he also conducts training and inspections and serves as an expert witness in insurance investigations. From his start with pools in 1967, he's been a pool manager, service technician and contractor, operating Van Bower Pool, Patio & Spas from 1971 until 1991. He began consulting in

1989 and co-founded Van Bower & Wiren in 1995 to specialize in high-end pool-construction projects. He's been active in trade associations throughout his career at the local, regional and national levels, has won numerous design awards and has been inducted into the Swimming Pool Hall of Fame.

Bruce Zaretsky is the owner of Zaretsky and Associates, a landscape design/installation/consulting firm in Rochester, N.Y. Since starting in the landscape design industry in 1979, he and his firm have become nationally recognized for their creative and inspiring landscapes and waterfeatures in projects ranging from small residential spaces to innovative public projects. Zaretsky also works as the Landscape Consultant to the Town of Penfield, working with developers to ensure that the city's beauty is preserved. He teaches courses on landscape design and installation at the Chicago Botanic Garden and at national landscape conferences, and recently his firm has placed emphasis on conceiving and installing healing and meditation gardens for healthcare facilities and on promoting sustainability and conservation in the landscape industry.



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Three columnists contribute to 'Currents': **Mark Holden** is a landscape architect, contractor, writer and educator specializing in watershapes and their environments. He has been designing and building watershapes for more than 15 years and currently owns several companies, including Fullerton, Calif.-based Holdenwater, which focuses on his passion for water. His own businesses combine his interests in architecture and construction, and he believes firmly that it is important to restore the age of Master Builders and thereby elevate the standards in both trades. One way he furthers that goal is as an instructor for Genesis 3 Design Schools and also as an instructor in landscape architecture at California State Polytechnic University in Pomona and for Cal Poly's Italy Program. He can be reached at mark@waterarchitecture.com. **Mike Gambino** owns and operates Gambino Landscape Lighting in Simi Valley, Calif. A graduate of Adelphi University with a bachelor's degree in business administration, he has been a California-licensed landscape contractor since 1990. In 1995, he began specializing in high-performance low-voltage landscape lighting systems designed and built to last. For more information, visit his web site: www.gambinolighting.com. **David Peterson** is

president of Watershape Consulting of Carlsbad, Calif. He's been part of the watershaping industry since 1994, when he began working for an engineering firm that specialized in large aquariums and marine-mammal exhibits. In 1998, he stepped onto to manufacturing side of things with Polaris Pool Systems, ultimately serving as vice president of engineering there before starting his own firm in 2004 to support industry professionals with design, engineering and construction-management services. He earned a BS degree in civil engineering in 1995 from the California State Polytechnic University at San Luis Obispo and is a registered civil engineer.

Mike Farley is a landscape architect with more than 20 years' experience and is currently a designer/project manager for Claffey Pools in Southlake, Texas. After receiving his degree in landscape architecture from Texas Tech University, he began his professional career in California with a high-end landscape-design firm through which he became involved in several pool-remodeling projects. He later joined Geremia Pools in Sacramento, Calif., where he worked for six years before returning to Texas in 1998. A graduate of the Genesis 3 schools, he assumed his current position in the fall of 2003.

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By Brian Van Bower

Fulfilling Prophecies



If you're paying even the slightest bit of attention to the world at large, you've probably heard more than you ever wanted to know about current economic conditions.

Indeed, everything that has happened in the past year or so with both our national and the global economy has made it hard for some people to think optimistically about the future. These are perilous times, as some say, and in one way or another, I know we're all being affected by what's going on.

But that doesn't seem to be the whole story. In fact, lots of my recent conversations with watershapers have reinforced my view that there are positive ways to respond to the current business environment. I'm even emboldened to say that, for some watershapers, the news hasn't all been bad.

True, there are some who are worried and are flirting with depression. Some have seen their businesses slow to a stand-still; borrowing the money needed to keep moving forward has gotten very hard to find; and in absorbing the steady drumbeat of negativity about the economy, it's tough for these folks to see the future as being anything other than bleak.

In sharp contrast, I've spoken with far more watershapers who continue to

My recent conversations with watershapers have reinforced my view that there are positive ways to respond to the current business environment. I'm even emboldened to say that, for some watershapers, the news hasn't all been bad.

report that they're doing very well: Business is still advancing because people who have money still have it – maybe a bit less than before, but they see this downturn as temporary rather than permanent and are still in the market for beautiful, artistic watershapes and exterior environments. These watershapers (and I count myself among them) are upbeat about their prospects and, I dare say, are still having fun.

sound footings

I make no bones about the fact that I thrive on positive energy and that talking with those who are somehow in a good mood always makes me feel better. I'm not belittling those who have been caught up short by recent trends, but as anyone who reads my columns knows, I strongly believe that mood and attitude govern our ability to cope as individuals, businesses and project teams – and even as a nation.

Look at it this way: When the stock market tanked late in 2008 – and did so in a big way – the corporations whose stock prices declined were not, in fact, worth less than they had been just a few days prior. What actually changed was a perception of value, and that's what led to the fall in stock prices. There was bad news, people decided to sell and the stock market took the blows. And that's less of an oversimplification than it might seem.

What interests me in this context is that for everyone who sold stocks at lessened values, there had to be someone willing to buy at those depressed levels. In other words, the market filled with bargains, and there were plenty of people willing to take advantage of the situation because they had attitudes and insights that enabled them to see through the situation and plan for the future. One among them was Warren

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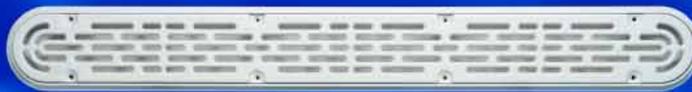
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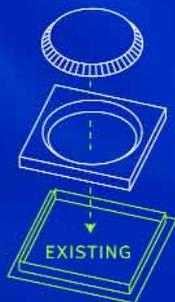
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Buffett, who bought huge blocks of stock knowing that it might be quite a while before he will realize any gains.

All of which brings up the fundamental point I want to make in this discussion: Regardless of market conditions, we always have a choice in how we approach and plan for the future. Among watershapers these days, I see a clear division

between those who are still prospering and those who've seen their businesses dry up, and I believe the disparity is largely due to attitudes that drive actions.

Consider this case: I recently spoke with a master tile installer with whom I've worked on a number of projects. He told me the story of a local pool builder who mostly does mid-range pools and de-

pends on volume to keep things going – not only a tough market these days but also a difficult business model. It's a good firm with a good reputation, but it has certainly seen its business drop off in the past year.

The builder had been asked by one of his clients to install an all-tile finish in a pool. The builder had never done such a project before, but rather than rejoice in the opportunity to work with a luxury finish, he'd actually tried to talk the client out of it, expressing the vague concern that the tile would be "too slippery." Having no experience with tile pools, neither the client nor the builder knew that poor footing is *not* a common complaint about tile finishes. In all my years of specifying all-tile finishes, in fact, it's a complaint or concern I've never, ever heard.

The client persisted, so, to head him off, the builder actually hired an attorney to draft a disclaimer warning of the possible danger. Instead of reflecting and amplifying the client's excitement about purchasing something valuable and beautiful, the builder injected fear into the process. And this isn't an issue of leaving cash on the table: It's one of depriving a client not only of the desired finish but also of the pride of ownership that would have come with it.

one way or another

As I see it, the builder's attitude served as a key factor limiting his ability to step up and operate on a level that would increase his chances of prospering in today's marketplace. Not to overgeneralize, but I also see this as a case in which an approach based on value, confidence and optimism was defeated by fear and insecurity – and that this is exactly the sort of internal conflict that is driving the current evolution of the watershaping business.

In essence, I believe that what we've seen through good times and not-so-good times in the past decade is the emergence of an entirely separate watershaping industry that stands outside the traditional boundaries of the pool and spa industry and the other industries that have conventionally played parts in the way water is used in design and construction projects.

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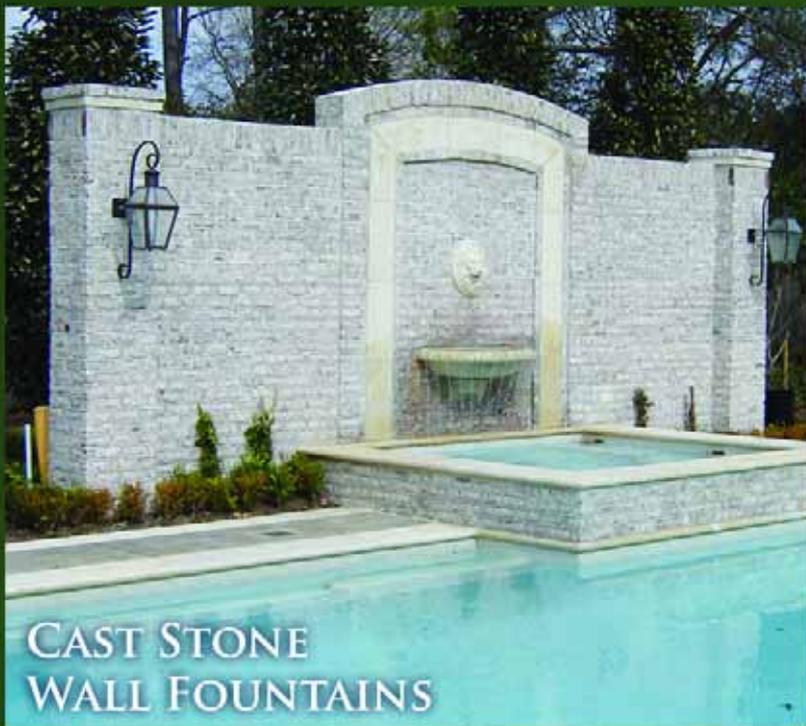
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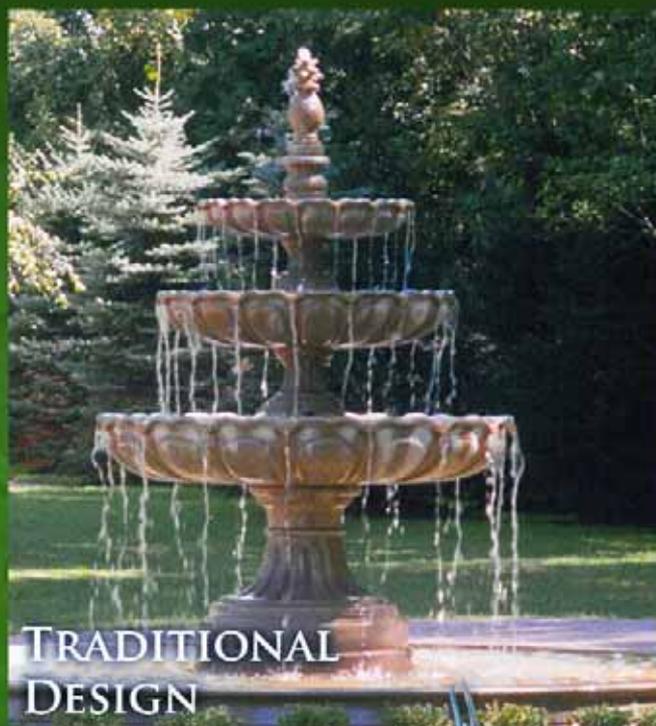
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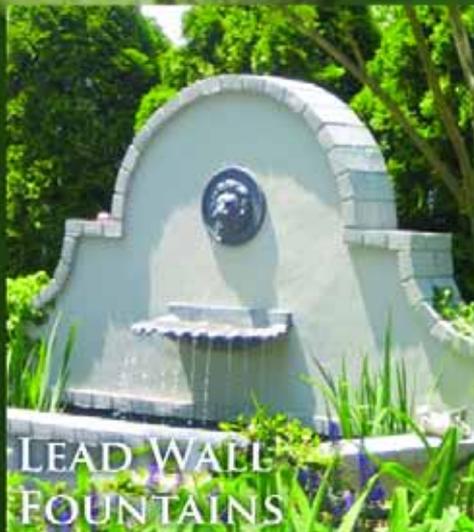


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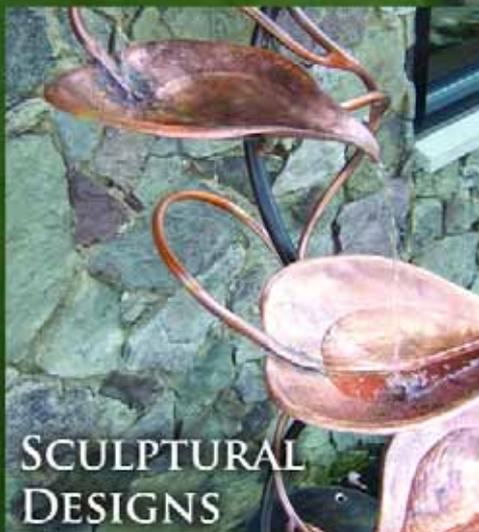
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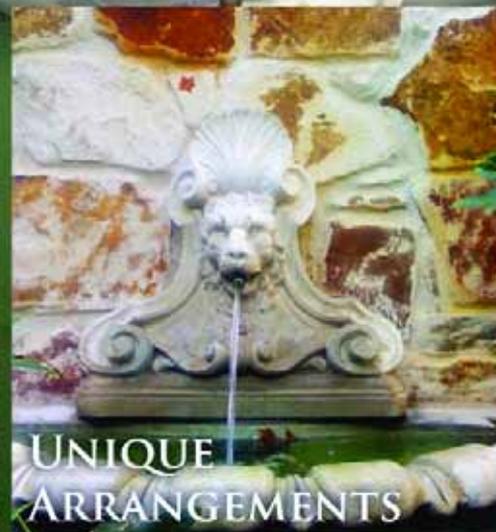
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On one branch of that evolutionary split, we have those people who have not embraced the messages, attitudes and knowledge base that have defined both *WaterShapes* and the Genesis 3 design schools for more than ten years. In fact, it never ceases to amaze me that, a full decade into the existence of the magazine and the educational resource, there are still

those in the mainstream pool/spa industry who have never heard of either one. We welcome those people to the party – better late than never – but it’s interesting that even in the relatively compact universe of watershaping, there are people who remain on the outside looking in, often by choice.

Lots of those outliers are caught up in

I believe that what we’ve seen through good times and not-so-good times in the past decade is the emergence of an entirely separate watershaping industry.

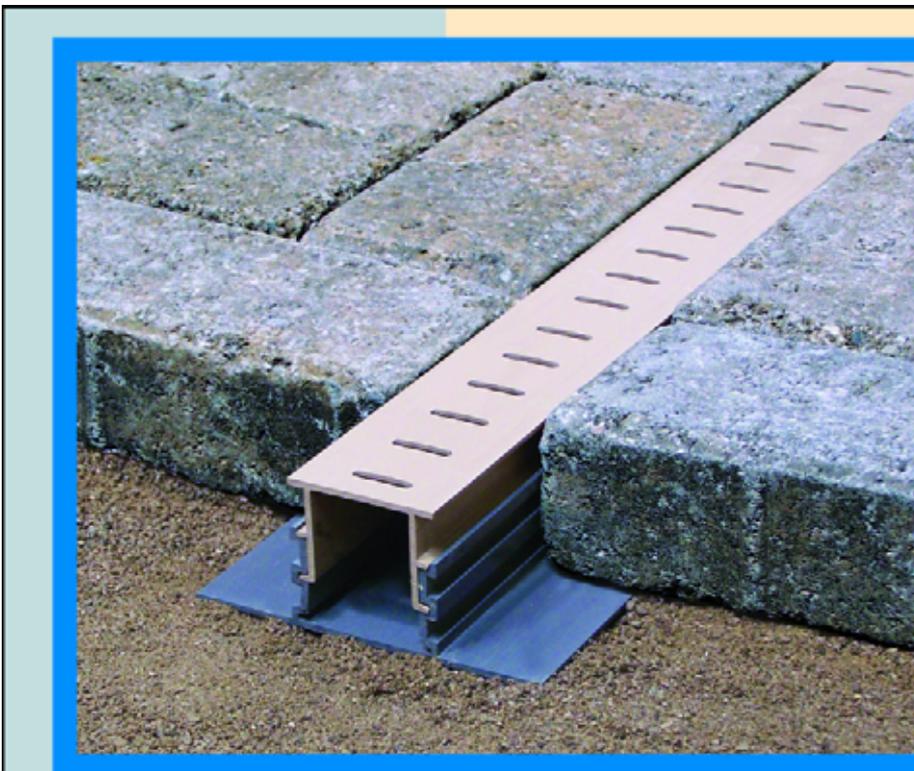
the “old industry” mentality and are suffering greatly through these volatile times. But they are joined by lots of people and companies who know all about this magazine and Genesis 3 and might *talk* like new-generation watershapers, but don’t truly share their attitudes.

(It’s important to note that this isn’t strictly a high-end-custom vs. low-end-volume distinction: Rather, the difference I’m highlighting has to do with a mindset that prevents people from adopting more progressive and expansive views of their own businesses. The relative affluence of the clientele is really just a product of a positive mentality and the actions that result.)

On the other side of the evolutionary tree are those who have embraced a more powerful approach to watershaping and have joined and helped define a whole, new, separate industry. I don’t believe it is coincidental that these happen to be designers and builders who are doing the best jobs of thriving today: Their “new attitude” has driven them to expand their knowledge bases, offer broader ranges of aesthetic and technical options and, perhaps most important, unshackle themselves from reluctance to try new things and face the future with joy and energy.

I’m gratified by how many of these people have participated in Genesis 3 programs and seem to have internalized every aspect of the positive outlook carried in each issue of *WaterShapes*. Certainly, neither are prerequisites for bolder, more optimistic thinking and actions, but the correlation is so strong that it’s impossible to ignore.

For all the nuances and complexities involved in advancing any business, there remains this fundamental distinction: To do something different, you first have to *think* about doing it. Returning to the builder mentioned above, making a client



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fear the possibility of slipping on an all-tile finish points clearly in one direction, while getting himself excited about the fact that he'd be installing his first-ever all-tile pool would have driven him in the other. The action begins with a thought, and a thought is *always* a matter of choice.

comes the good

I believe and have often argued that, good times or bad, embracing this positive form of thinking and adopting this lively approach results in fewer yet better jobs, more beautiful work, greater profits and an improved overall lifestyle. At this level, work is simply more fun and enjoyable.

And now, it seems, to this list of benefits we can add one more: Operating in this way means you'll apparently be far less vulnerable to the ebbs and flows of the general economy.

To be sure, the current economic downturn may eventually "trickle up" to the point where it limits the custom end of the watershaping business, but it's clear to me just the same that our new industry is going to feel the pinch later and to a lesser degree than the traditional ones, and I'd be more than happy to bet it will bounce back sooner, and with a roar. The lows, in other words, won't be as low, and the highs will be higher.

I have sympathy for those who might be coming to this realization late in the game. After all, you can't just throw a switch one day and decide that all of a sudden you're in a different category. Stepping up to new levels takes planning, an investment in education and an ongoing willingness to work hard at improving your acumen and skills. It's all about positive action over time.

By the same token (although I've never heard that the *late* bird gets the worm), I don't think there's ever a bad time to make a good, positive change in direc-

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tion. And for those who remain steadfast in their adherence to the old, traditional value system that characterizes parts of the pool/spa industry and simply refuse to change, I find it difficult to be very sympathetic.

It seems cruel to say it, but there's no doubt in my mind that current economic trends will thin the ranks and drive marginal and/or sub-standard players from the marketplace – just as occurred in the late 1980s and early '90s. We know as well that economic performance is cyclical and that the mighty engines of the U.S. economy will rev back up. When that happens, we will very likely see some level of pent-up demand unleashed in the market. I can't feel bad knowing that, when recovery comes, many of the people who have in my view held watershaping back will no longer be part of the scene.

Another positive: In the boom years prior to the downturn of 2008, the industry was so flush with business that it was easy to take success for granted – and watershapers weren't alone in doing so. In fact, all that many consumers had to do to be "successful" was buy a house, live in it a couple of years without making any improvements, and sit back and watch its value appreciate. I believe many people began to think they were entitled to financial success just by virtue of the fact they lived someplace.

The result is that many people in business lost sight of what it really means to be successful. There was less thought given to creating objects of value and more time spent in becoming collectively lazy in thought and action. So what we're witnessing now is a mass-scale recalibration of expectations – something I see as a healthy process that will force watershapers to appreciate the nature of success on a more grounded, focused level that will benefit both clients and watershaping alike.

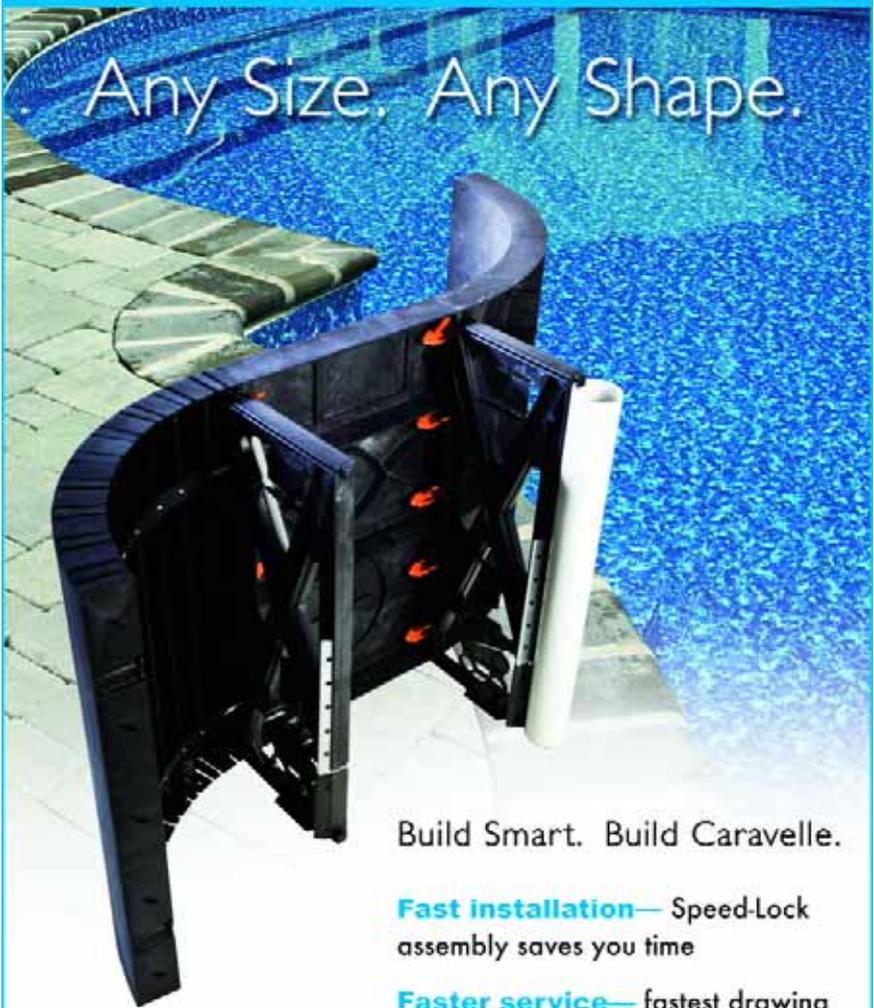
clearly now

It is true that tough times do not leave us with easy answers and that, sometimes, things will happen that are beyond our control. The cold fact is, we may well be facing tighter markets, reluctant buyers and reduced opportunities for an indefinite period of time.

In a place where nobody really seems to know how long our current economic woes will continue or how bad things might get, I choose optimism tempered by realism and will never allow myself to lose the clarity with which I've seen things for the past ten years. In short, I will never see an all-tile pool as being hazardous or as something other than

a foundation on which I can build future prosperity.

As I see it, both sides of the evolutionary tree are running into self-fulfilling prophecies. For myself, I choose to ignore those who are letting bad times drive them under and choose instead to associate with those who will keep me moving forward, in good times and bad. **WS**



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By Bruce Zaretsky

In Service of Trees



I recently read a short article in a construction magazine in which the writer described a fairly convoluted process by which he had “protected” a tree on the site where he was working. Basically, what he did was wrap the trunk in two-by-four studs, securing them in place vertically with some loops of metal strapping.

In his estimation, this was just what he needed to keep the tree from being damaged by accidental equipment bumps – the boards, in effect, would suffer and the tree would be spared any battle scars.

Although I admire and respect his desire to protect the tree – something that far too many construction firms neglect – my suspicion is that he accomplished nothing by dressing the tree in this hoop skirt. Indeed, while the photographs that accompanied the article were meant to show his trunk protector in action, it was clear that the tree was headed for an early demise, as the new home had been positioned just a few feet from the trunk.

I’m not a seer and cannot predict what will happen two, three or five years down the line, but experience tells me that this tree will not be with us in 2013 and may not last even that long.

All of us at one time or another run up against trees that are very much in the way – and our clients simply won’t let us remove them. To be sure, working around such prized specimens can be a real (but worthy) pain.

steering clear

All of us at one time or another run up against trees that are very much in the way – and our clients simply won’t let us remove them. To be sure, working around such prized specimens can be a real pain, which is why so many in the construction trades have passive-aggressive attitudes about them and just wish they’d go away. Indeed, this may be why so many turn their backs when it comes to doing what it really takes to protect them.

The resentment of such trees grows by leaps and bounds when they create traffic problems on site, which might explain why their bases become such great resting places for pallets of concrete, unused equipment, scaffolding and garbage dumpsters, among other things. In actuality, the weight of these objects does more irreparable harm to trees than the occasional ding with a backhoe bucket or skid-steer loader ever could.

The plain fact is that not only do we need to protect the *trunks*, but we also need to keep equipment and materials far from the trees’ *roots* as well. While trees scarred by encounters with equipment show their injuries in an obvious way, the injuries created by root compaction and damage are not so immediately obvious – nor do the consequences manifest themselves right away.

I would need a calculator to tally up the number of times I’ve been called to clients’ homes through the past 30 years to answer the same question: “Why is my tree dying?” In most of these cases, the clients paid a premium price for a “wooded” lot only to be left without a single thriving tree even five years later. The main culprits? Root compaction, root damage and

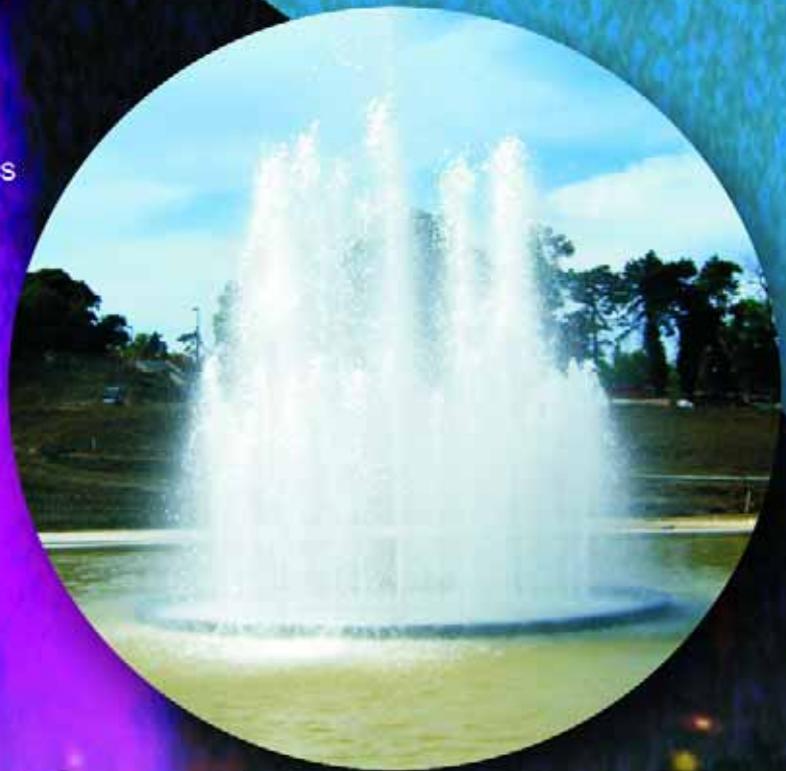


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changed grades.

In my consulting work for the town of Penfield, N.Y., I spend a substantial amount of time walking around potential building sites to evaluate vegetation, particularly the trees. I review grading plans presented by the developers' engineering firms to see where cuts and fills will be executed, and I also check for utility and roadway placements.

Once my surveys are complete, I make recommendations as to how particular trees or groupings of trees might be saved, either by changing or removing some building lots, repositioning roadways or making any number of other changes. I do so for a simple reason: You cannot cut a roadway within the drip lines of trees and expect them to survive. Nor can you install storm sewers or raise the grade by several feet in the close proximity to those trees without doing them dramatic harm.

Trees and their surroundings *must* remain undisturbed at least to their drip lines (that is, to the full extents of their



Although it was clearly someone's intention to put up some kind of protective barrier around this tree, it didn't happen soon enough to keep a couple pieces of equipment from finding resting places well within the tree's drip line. It's a situation that can harm the tree — but the damage likely won't manifest itself until long after the construction crew has left the site behind.

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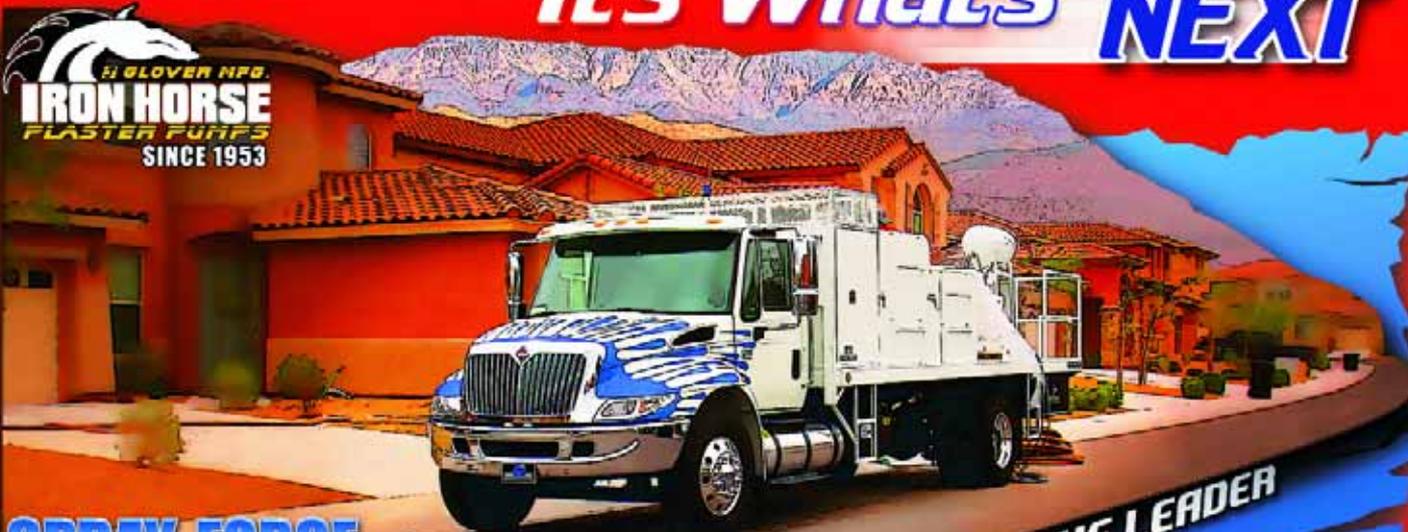
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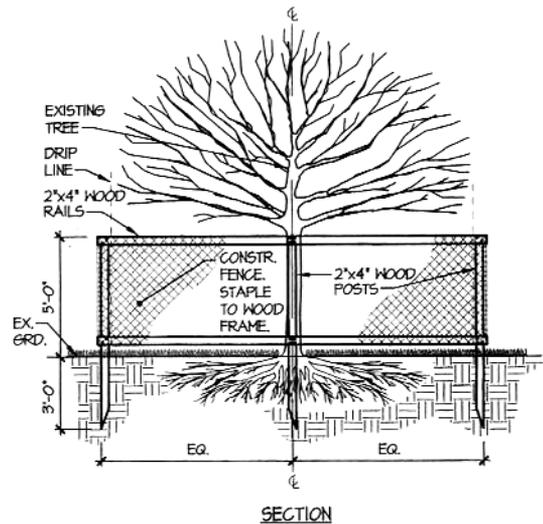
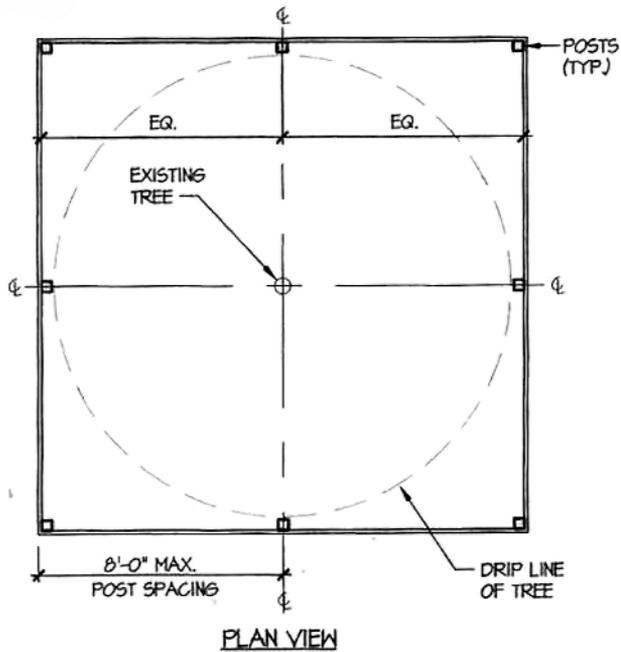
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canopies of branches and leaves). The running of equipment within those lines and over the roots is a surefire ticket to those trees' slow deaths: Compaction of the soil blocks the roots' ability to exchange air, water and nutrients with the surrounding soil and slowly (but surely) suffocates them.

creating a perimeter

Part of the problem is that, when faced with mistreatment, trees don't immediately shrivel up and die. It can take months for the first signs of distress to materialize – branches dying back, increased susceptibility to diseases and insect infiltrations, leaf loss and more – and sometimes years for trees to die completely.

Gradually, however, dead growth shows no signs of regenerating; branches break off in storms and fall to the ground (or onto houses, cars or homeowners!); and such trees are eventually beyond recovery. Finally, they must be removed before they become even more menacing.

This, to make a long story short, is why it's absolutely imperative that trees must be protected on job sites.

By *protection*, I mean that trees must be given wide berth by all equipment, people and materials, typically by installing fences around them that extend to their drip lines. The simplest and least costly way to do this is to install snow-fence stakes to create perimeters and use orange construction mesh to block access to the protected areas. It's that simple.

It's also inexpensive: By his estimation, the builder mentioned at the outset of this column spent about \$250 (in time, materials and labor) in wrapping his tree in lumber and probably ended up killing the tree anyway by damaging the roots in setting the home's foundation – although he'll be long gone and off to another job site long before that happens. By contrast, stake-and-mesh systems cost very little and are a good way to save trees. Indeed, builders will never need to give the trees' safety a second thought.

To be sure, there are situations in which maneuvering close to trees is inevitable. If there's truly no alternative to driving over root systems, then a fairly effective way to protect them is to pile

at least eight to 10 inches of nursery mulch throughout their drip-line zones, thereby distributing any load and minimizing the damage to be done by equipment.

If you use this approach, you must avoid turning the equipment (especially skid-steer loaders) within the drip-line zones: This will dig the tires or treads into

the mulch and apply pressure to the ground below. And remember: It's equally important to *remove* the mulch at the end of the project.

At that time, if it's apparent that, despite your best efforts, some compaction has occurred, it is essential to bring in an air-infiltration gun to aerate the soil around the tree and break it up a bit.

Continued on page 26

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Trees must be given wide berth by all equipment, people and materials, typically by installing fences around them that extend to their drip lines.

It's that simple.

making the grade

Beyond the instances highlighted above in which root damage and/or compaction played leading roles, an equally difficult time for trees results from projects that involve changing the grade in their vicinities. Quite often, in fact, new development inevitably means changed grades.

Through the years, I've advised many developers on ways they can alter their plans to avoid grade-change issues and protect stands of mature trees, and almost universally the response is: "We can't do that." The reason they usually give is financial, and they seem immune to my counterargument that a wooded site is more valuable than a non-wooded one and they might thereby recoup their costs many times over. Make sense to me, but doesn't seem to influence their thinking at all.

In a recent situation that I was involved with, for example, the developer presented a plan for a site where he'd bought three houses in a row and planned to knock them down and replace them with four cookie-cutter commercial buildings. The lots had originally been residential and had some trees that had been cared for by the homeowners, including a 30-inch sugar maple, a number of oaks in the 24-inch range and a large stand of pines.

As presented, the plan called for stripping the site and laying out the four buildings on a rigid grid with more-than-ample parking areas all around. I walked the site, then went back to my office and rearranged the footprints to preserve the largest of the trees and the stand of pines. What I suggested in no way diminished the total square footage of the buildings and preserved 85 percent of the parking spaces.

I saw the pines as creating a picnic area for employees of the future businesses that would occupy the buildings and suggested establishing a village-like appearance rather than the all-too-common strip-mall look the developer had planned. I presented my ideas to the developer and the town's engineer (whom I answer to), and the first words out of the developer's mouth were, "We can't do that."

His reasoning was simple: He told us that he needed to cut and fill areas to make the drainage system work and that the trees were in the way. I countered with my point that trees would make the site more valuable and that he could more than offset the cost of saving them – and went on to explain that all he needed to do was build wells around the trees before grading to his heart's content.

Building wells of this type is relatively simple: You just build circular retaining walls about eight feet out from the trees to keep the bases of their trunks from being buried; beyond the wall, you cov-

er the rest of the drip-line zones with crushed stone into which you've set vertical pieces of four-inch PVC pipe at intervals about eight feet apart around the tree, spanning the distance from the new grade to the original one. This is sufficient to keep the tree healthy and protect it from root damage as well.

encircling a solution

In the plan I redrew, I used these wells to save all of the trees. I also set up traffic patterns so there would be no traffic within the drip lines – and even if there were, the crushed stone would prevent the roots from being damaged by compaction and the piping would allow for air infiltration.

I explained all of this to the developer; he said he'd discuss it with his partners and engineer and get back to us. The conversations continued and I held out some hope, but I made the mistake of going on a short vacation: With me out of sight and perhaps out of mind, the developer swung into action and leveled the site. I was shocked to drive by a few days after my return to find nothing more than a ten-acre patch of dirt.

This was a bad outcome from my perspective, because enhancing the property was possible at a relatively small expense that might easily have been recouped as a result of the site's enhanced aesthetics and greater visual appeal. The troubling thing is, this sort of retrograde thinking happens all the time in places all over the country.

There are other issues, of course, and other possible solutions. Not all sites, for example, have areas that need to be filled. In fact, some need to be cut to create proper grades for drainage and effective use.

In such cases, I suggest staying away from desirable trees to their drip lines and leaving them alone on plateaus. Alternatively – and if planning time allows – it is possible to start a year or so before construction begins at gradually root-pruning trees back toward their trunks to promote root development in tighter circles. This is a program that requires the expertise of a certified arborist who knows the proper techniques and will be on hand through the entire

process to monitor the trees' health.

I started out this discussion with a desire to impart some simple advice on protecting trees on construction sites, and I've done so to the best of my ability. But I'm not an arborist, and I know well enough that if I have any doubts about how to handle trees put at risk by my actions on site, it's time to call in a profes-

sional and get his or her recommendations on how best to proceed.

At that point, it's my responsibility to make certain everyone on site follows the program that's been established: It's the best way I know of to keep trees safe – and the best way to preserve the value that trees add to the properties we're called on to enhance. **WS**

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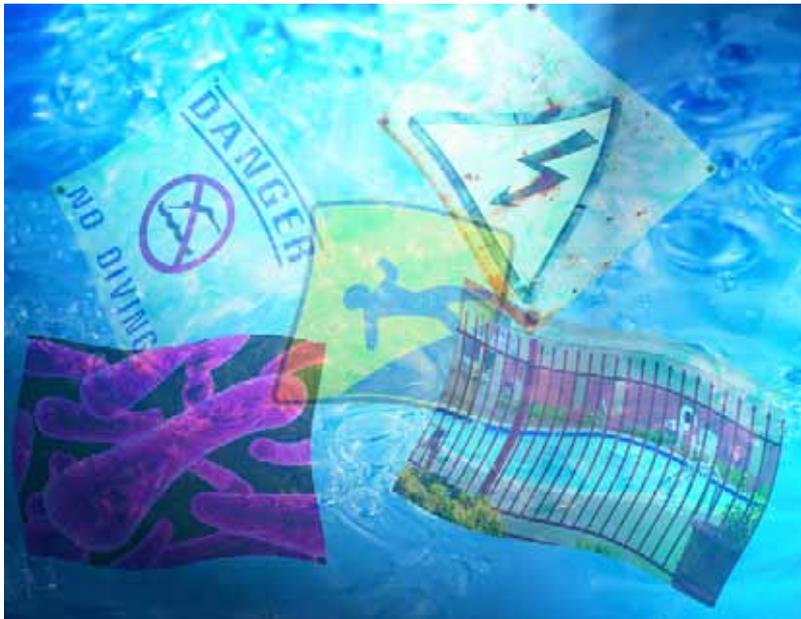



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By Mark Holden

Safety First



Last October, I had the pleasure of attending the American Society of Landscape Architects' convention in Philadelphia. While there, I spent much of my time sitting in the *WaterShapes* booth in the exhibit hall and found myself fielding a surprising number of questions from landscape architects about aquatic safety – and particularly on the new federal regulations and standards having to do with entrapment prevention.

At first, I thought it was strange that this was such a hot topic among landscape architects, who, as a rule, haven't been all that involved in the technical details of pools and spas. But before long, it occurred to me with some strength that more and more landscape architects are indeed becoming watershapers – and, more important, that they recognize a need for developing knowledge and new skills in doing so.

In other words, safety is obviously an important part of watershaping: As professionals new to the field, they recognize that they need to know all about it.

This experience in Philadelphia has since triggered new thinking on my part when it comes to what I teach student landscape architects in the classroom. Safety has always been part of what I help them understand, but the questions that came at me from licensed, practicing landscape architects made

While it is true that swimming may well be the healthiest of all forms of exercise, we accept the fact that immersion in water always presents elements of risk.

it even clearer to me that aquatic safety in water is a complex set of topics, each of which needs to be covered in some detail and ultimately accommodated in watershape designs and plans.

aquatic cautions

As we all know, aquatic exercise and play are not, by nature, entirely safe activities. While it is true that swimming may well be the healthiest of all forms of exercise, we accept the fact that immersion in water always presents elements of risk.

In examining those risks, it's helpful to break them down into separate categories, specifically: drownings, entrapments, diving accidents, slip/fall hazards, electrical shocks and infections. Periodically, these become controversial, societal issues, as has recently been the case with suction entrapments and is often the case in times following outbreaks of viral and bacterial infections involving cryptosporidium, a waterborne agent that causes severe and sometimes fatal intestinal distress.

The emotional and social profiles of these hazards are often heightened by the fact that small children are frequently the victims in drowning and entrapment accidents and that the elderly often fall prey to waterborne infections. The fact that these incidents are mostly preventable forces those involved in watershape design and construction to press forward constantly in seeking workable solutions and implementing preventative measure.

The pool/spa industry has dealt with these issues for years now and continues to seek the right combinations of remedies. Those outside that industry – meaning the large majority of landscape architects, for instance – are generally not so well schooled in these issues but *do* need to get up to speed quickly if their inclination to get involved in watershaping is to continue to grow.

Continued on page 30

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I'm involved with the full range of safety-related issues on a couple levels: I teach landscape architecture students in a university setting, but through my firm, Holdenwater (Fullerton, Calif.), I also deal with these issues daily in conducting safety inspections of commercial swimming pools (where we see a multitude of problems resulting from improper design and

maintenance) and in working with pool contractors and landscape architects to make certain their plans pass legal tests set forth by federal, state, county and municipal regulations, codes and standards.

Unfortunately, what we see in many plans are dangerous design choices – sometimes by pool professionals but far more often by landscape architects who

simply do not know any better. When we encounter these problems, we do all we can to enlighten these professionals about exposing their clients and a watershape's users to risk.

Frankly, I doubt that landscape architects and even most specialists in aquatic design will ever become fully aware of *all* pool and spa codes and standards: These provisions are epic in scope and scale and derive from myriad sources. Nonetheless, there are some crucial areas in which we all should be well informed.

Helpfully, these areas of concern are not entirely dependent on details pulled from codes, regulations, laws and standards: In many cases, in fact, a commonsense appreciation of what is and is not dangerous is most of what anyone needs to create watershapes that are as safe as possible.

Let's look at each of these classes of safety challenges in turn:

► **Entrapment:** Within the past year, suction entrapment has become the most discussed of all safety issues related to pools and spas. These accidents are statistically rare compared to some others, but they are so horrific and are so often fatal that they merit special attention.

In *WaterShapes'* November issue, my fellow "Currents" contributor Dave Peterson offered a comprehensive overview of the regulations, codes and standards aimed at preventing entrapment accidents ("Entrapment Meltdown," p. 28), so I won't dig in as deeply here as I otherwise might. But do let me isolate a few key points here to make the discussion complete with respect to what I think watershape designers need to understand.

In essence, entrapment is caused when hydraulic systems run too fast relative to the equipment and the plumbing configuration. What can a watershape designer or a landscape architect do to protect bathers from improper system configuration? The first step, I think, has to do with placing conditions on builders of their projects to meet (and, whenever possible, to *beat*) the minimum safety requirements imposed by code.

Landscape architects' plans typically have detailed notes for irrigation- and drainage-system installers, and I think the same should go for pool contractors: In other words, you should spell out various

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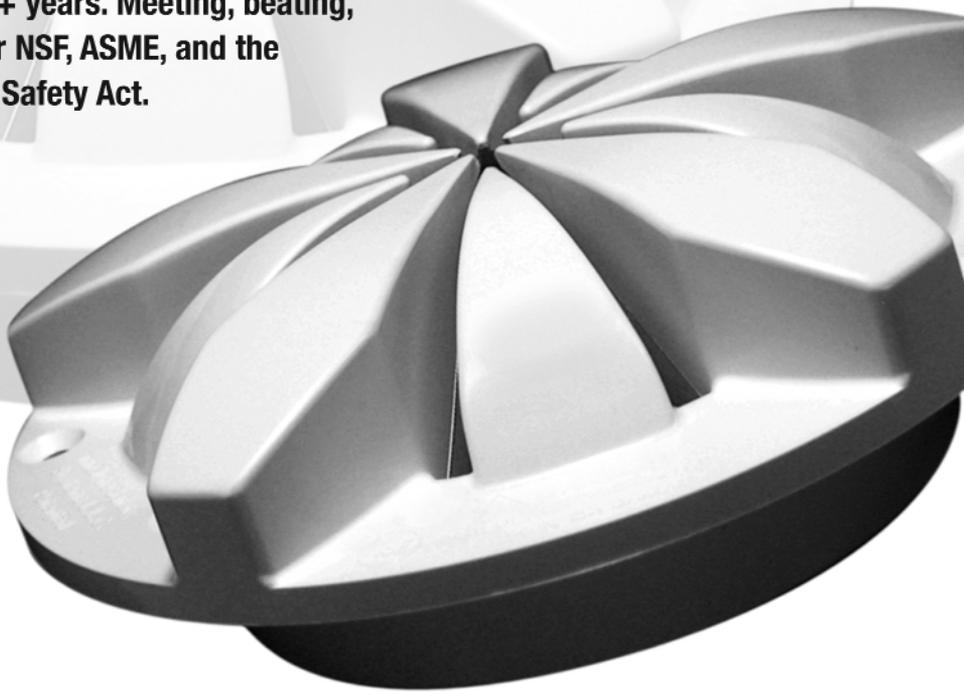
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safety-related details, specifying, for example, the use of line velocities that will prevent suction entrapments.

It's unfortunate that so many water-shape builders ignore line-velocity issues and therefore create situations in which entrapment is a hazard, but that doesn't mean designers can't take control by requiring maximum flow rates of five feet per second in suction plumbing and seven feet per second for discharge plumbing. I'd even go so far as to require flows of four feet per second on the suction side: This would go a long way toward reducing concerns about "fast" systems.

The same goes for drain grates. Instead of letting contractors use any grate pulled off the truck, specify what you want or place a general restriction on what can be used by specifying something along the lines of "all suction devices shall operate at 75 percent of the testing-approved limits for said devices (that is, drain grates rated for 206 gpm shall never be used on any system operating at 154 gpm or more)."

I'd also suggest specifying split-suction suction drains separated by 48 inches or more. Health department codes specify 36 inches, but why ride a thin code margin when the adding a bit of pipe is the only issue? As I see it, entrapments are preventable if fundamental details of this sort are addressed by both designers and installers.

► **Electrical Shock:** We all know that water is a highly efficient electrical conductor – and, as watershapers, that our man-made bodies of water are circulated and illuminated using electrical power. As is the case with entrapment, when safety standards established for system design and construction are not met, the combination of electricity and water can become dangerous – and fatally so.

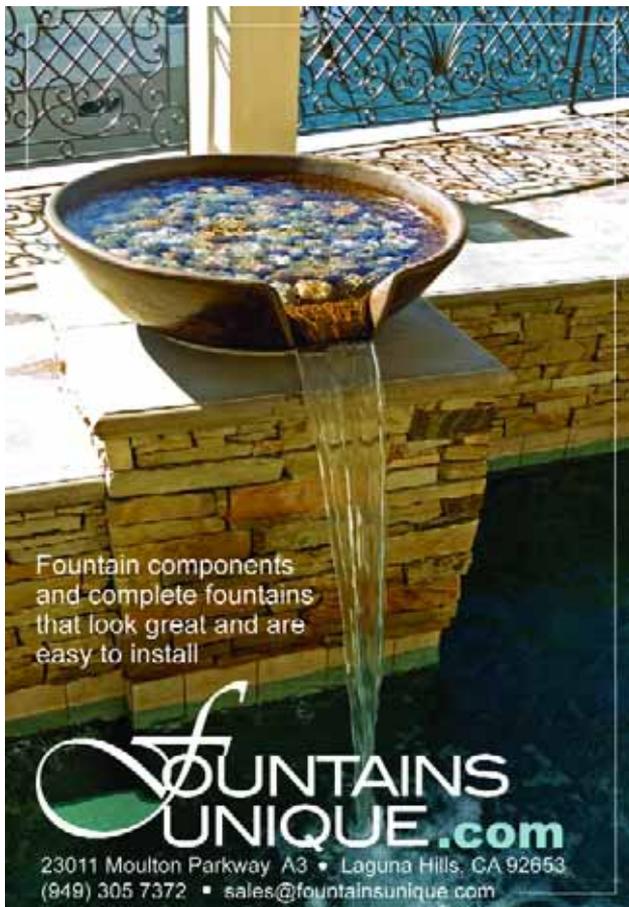
Unlike entrapment, however, electrical safety in watershapes is rarely discussed these days. I think that's a mistake: After diving into too many pools for inspections and having seen far too many accidents-waiting-to-happen atrocities in

pool construction related to electrical safety, I think more attention should be paid to these systems.

The most common problems I see are water in improperly sealed light niches and lights set up without ground-fault circuit interrupter (GFCI) protection. I shudder to think about what might happen to people swimming in these bodies of water when the lights come on: Frankly, I'm surprised electrical safety is not a more prominent issue than it appears to be.

Once again, designers need to be aware of and specify measures to be taken in construction to ensure project safety. This means notes and specifications directing builders how to protect against electrocution; mandating the use of appropriate GFCIs; and requiring full and proper bonding and grounding of all metal components.

Complicating matters on this front is the fact that some products work only for limited amounts of time. Most single-



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gang GFCI units, for example, require monthly testing that is seldom done – but if and when they fail, they bring risk to every bather who might use the watershape. At a minimum, what designers can do is specify that all submerged lighting must be protected by a GFCI device and set baseline criteria for their selection, installation and, yes, *testing*.

Another possibility, of course, involves specification of fiberoptic or LED lighting – a surefire means of avoiding electrocution hazards.

► **Diving Injuries:** Although fewer and fewer watershapes are being designed with diving boards or diving wells these days, many of the landscape architects' plans we see still include these features and seldom demonstrate that the designers are paying any attention to what happens to divers once they enter the water. That's not good, because diving accidents can result in severe head or neck injuries – and drowning can be a byproduct of these impacts.

In referring to this issue, I tell these professionals what I tell my students: Forget the water when providing the physical form for a pool, spa or fountains, then imagine that you personally need to get into that watershape, move around within it and even sit down if that's what's desired. The exact same concept applies to diving: If you think through where you're locating a diving rock or board, then obvious issues arise if you've chosen to do so in an area that is shallow or has benches or steps.

Obstructions are obvious hazards to be avoided, as are the improper floor profiles that are often at the core of diving injuries. In the former instances, common sense can be your guide; in the latter, there are minimum guidelines for the "diving envelope" for diving boards – recommendations that I always exceed. My general rule: If I plan on having people dive into a body of water, I make it deep, *really* deep, and make certain the diving area extends out far enough from the board that the

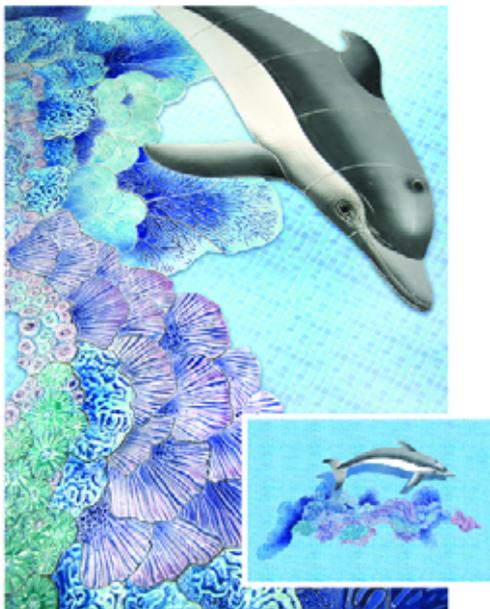
possibility of contact between a diver and the pool's floor is strictly limited.

In public and commercial projects, diving-related signage is a critical component of any design or plan. Public pools, for example, require signage alerting people to diving hazards, and many pools now instruct those using them that there is no diving allowed. The warning is conveyed using marker tiles set around the perimeter of the pool or spa; this may not solve the problem, but at least those willing to read will have been warned.

► **Water-Related Illness:** When the water in pools or spas is not properly treated or filtered, pathogens such as cryptosporidium, giardia, staphylococcus and legionella (among others) can infect bathers. There's a science to disinfecting water, and it's challenging to watershapers because different organisms respond differently to various types of chemical treatment. In fact, some of them have even developed immunities to approaches that had once been effective.

Continued on page 36

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Watershape designers should all be aware that proper sanitization is critical in any body of water with which people might become involved – and that means just about every watershape, no matter where it's built. Fountains, for example, were once considered “safe” because they aren't designed for direct human interaction, but in the real world it is no longer fair (or smart) to assume that such an exception exists.

There are many possibilities when it comes to water treatment, and watershape designers must define systems for all features with which people might come in contact. That means demanding proper turnover rates for filtration and circulation – details that should be indicated in plan notes.

I tell my students that there are five magic specifications that need to be included with all watershape designs: pump, filter, sanitizer, auto-fill and overflow – basic, but a start. Without all of these elements in place, you run the risk of exposing

bathers to waterborne pathogens – something that should not be anyone's goal.

► **Slip/Fall Hazards:** According to the Federal Government, slip-and-fall injuries account for one in three of all non-fatal injuries. Common sense tells us that water makes smooth surfaces slippery and increases the chance of someone falling and hurting him- or herself – a problem that can be exacerbated by the sometimes vigorous play in and around swimming pools.

If someone slips and falls in a space you've designed and is badly injured, you can be held accountable in a court of law, especially if your design carries no apparent accommodation for good footing. The solution is to mitigate your exposure to such liability by modifying your designs accordingly.

Polished granite, for example, has a fantastic look and I love it in landscapes – but it may be the worst-ever material to use as coping around a fountain or pool. Still, this material seems to be rising in popularity, so when it is unavoidable

I advise my students to alter its surface in some way (that is, flame it or bush-hammer it) or replace it with another material around watershapes.

We just worked on a fountain that presented just this risky use of granite. We advised the landscape architect who designed the project to flame all the horizontal surfaces to add texture and slip resistance while maintaining the polished look on vertical surfaces.

It's incumbent on watershapers to be aware of the coefficients of friction of various surfacing materials and avoid those that present slip hazards – especially if those hazards increase when the material is wet. This is such a key point that, on public projects, designers must prove to health departments and other agencies just how resistant various proposed materials are to slip/fall hazards.

► **Accidental Drowning:** Deaths by drowning – particularly those involving young children – are among the highest-profile of all incidents related to water-

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shapes. Known as the “silent death” because children often fall into water with no audible splash or other sound, it is (according to the Centers for Disease Control) the second-most common cause of death among children aged one to four years. In 2004, for example, 26 percent of all deaths of children in that age range were drowning incidents, with the vast majority of them taking place in backyard swimming pools.

This is another huge topic that could involve a discussion many times the length I’ve been given for this column. Suffice it to say that watershape designers need to know that there are multiple measures available to them that are intended to prevent these incidents, including fences, safety covers, self-latching gates, door alarms and submersion-alarm systems, among others.

Most experts recommend using multiple “layers of protection” in homes with small children, and all press the fact that there is no substitute for constant parental supervision. Different jurisdictions im-

pose varying sets of requirements related to details such as fence heights, cover configurations and more, with most of the rules applying only to new pool and/or spa construction.

Watershape designers need to be aware both of the risks and of the need to seek solutions based on the conditions presented by a given project: Simply put, what works in one setting may not be the right call for another, so research and careful, individualized consideration must be used to make given environments safer.

From a design standpoint, the fundamental concept is to create a physical barrier of some sort that keeps unsupervised children from gaining access to the water. At our firm, we’ve used fences, hardscape treatments and even landscaping to get the job done, all with an eye toward making whatever solution or solutions we choose to use as aesthetically pleasing as we can. Electronic alarms are also a possibility: When correctly installed and maintained, they of-

fer an aesthetically neutral option.

As for physical barriers, there are lots available products that get the job done without being offensive to the eye. There are lots of decorative fences out there as well as permanent hardscape structures that can also become part of a drowning-prevention strategy. In some cases, pool covers can be used – our preference being, for appearance’s sake, to use models that have hidden tracks.

stepping up

From top to bottom of this list of issues, it is fair to say that every watershape designer is responsible for seeing to it that their clients, guests and communities are provided with safe aquatic environments.

Art and recreation should not pose threats to those who would enjoy them. Making beauty *safe* requires creativity, technical savvy and situational awareness – and it all begins with a fundamental understanding of the nature of water and how human beings interact with it. **WS**

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For nearly six years, this was a project that occupied most of James Atlas' working life, challenging him and the staff at Platinum Poolcare Aquatech with pursuing development of a water-shape complex marked by great ambition, shifting needs and innumerable revisions. Now that his work is complete and the site is finally ready for its close-ups, Atlas guides us through a masterpiece he justly sees as his firm's crowning achievement.

Opening

a shell

Most of the time, residential construction projects that stretch beyond a half-decade in the making involve significant delays or work stoppages.

The project pictured here known hereabouts as "The Shell Pool" – took nearly six years to complete, and what's unusual about it is that it was basically a continuous effort. Even when we weren't on site, seldom did a day go by when we weren't deeply involved on some level in design work, engineering and/or project planning.

Now that it's finished, I can say without hesitation that this was the most detailed, refined, all-consuming project we at Platinum Poolcare Aquatech of Wheeling, Ill., have ever tackled. I can't begin to calculate the collective number of hours spent in client and staff meetings, phone conversations, skull sessions and design-revision meetings – and that *doesn't* include time spent on site in bringing this amazing project to fruition.

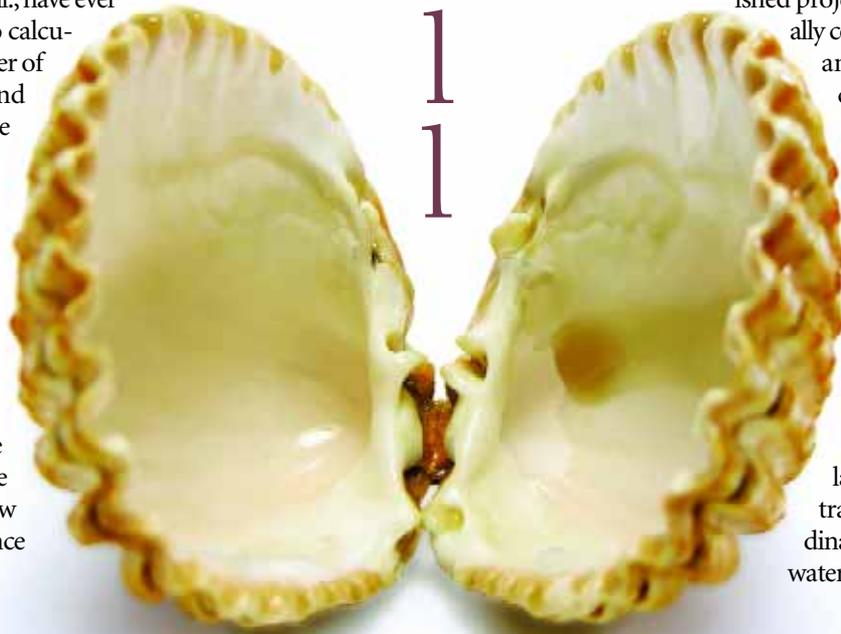
Even compared to the many intricate commercial projects we've worked on through the years, this one set a new standard in my experience

with respect both to the spirit of innovation and the mountains of patience required to get the job done. Today, with all that effort behind us, it's a rare pleasure to step back and get an overview of what we've accomplished – a pleasure I'd like to share with you here.

There and Back

When we first covered this project in *WaterShapes*' February 2008 issue ("Shell Games," Page 56), we were nearing completion and had just a few details left to consider. Our intention had always been to come forward with this follow-up look at the finished project sooner, but an unusually cold spring was followed by an equally odd wet and chilly summer that made it tough to arrange for the finished photography you see here.

As you may recall, our client is the matriarch of a large family and lives on a sprawling 140-acre estate in one of Chicago's most exclusive suburbs. The parcel includes multiple homes, a lake, woodlands and horse trails – and now an extraordinarily elaborate pool house/watershape complex.



By James Atlas



By the time we became involved, the pool house design was mostly complete: It was to be a three-level affair (two stories above grade and one below) and would feature not only an indoor swimming pool, spa, kiddie pool and sauna, but also a full array of cooking, dining and entertainment amenities (including a theater with an orchestra pit).

We'd been brought in to tackle the elliptical indoor pool and the free-form outdoor pool and had no idea in the initial stages just how extensive and intricate our participation would become: It was like peeling an onion only to discover that each successive layer involved increasingly elaborate technical and aesthetic challenges and details.

Take the indoor pool as an example: It's a simple 18-by-40-foot ellipse, but it had to be built in phases to accommodate construction of the surrounding structure – including the painting of the vivid, starry-night fresco that looms overhead on the room's arched ceiling.

As if that weren't enough, the detailing of the indoor watershapes kept changing as we moved forward. We knew going in, for instance, that the client wanted an elaborate tile mosaic of some kind inside the pool. After some back and forth, she lit on a proposal from Nick Powell of Craig Bragdy Design (Denbigh, Wales) to reproduce the flowing drapery of a huge chiffon scarf across part of the pool's wall and floor. Her choice led us to make a host of tricky on-site adjustments to accommodate the mosaic and make the illusion work visually.

Next, she let us know that she wanted to place a large clamshell structure at one end of the pool, under which she, her family and guests could access a channel connected to the outdoor pool. This object alone required many months of design, planning and fabrication and had to work structurally – no small feat given its 13-foot, cantilevered extent – as well as aesthetically: In short, if it didn't look convincingly like the top half of a truly giant clamshell, *nobody* (and especially not the client) would have been happy.

Nick Powell's insight again proved invaluable. Not only did he help us define many of the key structural issues, but he also came up with a tile design that lined the shell's underside with a shimmering, opalescent, mother-of-pearl finish and crusted the top with a rough surface that captures the essence of a clam's outer texture and appearance.



The clamshell that opens over the swim channel between the indoor and outdoor pools has rightfully become the project's icon, but there's much more going on in this space, including the multipurpose watershapes, the custom railings and a tile mosaic made to depict the flowing form of a chiffon scarf draped across the steps and down into the elliptical pool.



Boundless Intricacy

As you might also recall from the February 2008 feature, figuring out how to separate the indoor and outdoor pools proved to be a surprising challenge.

The swim channel under the clamshell was intended to allow easy access between the two pools, but the client (who knows as well as anyone how raw the winters can get in the Chicago area) wanted to be able to close the channel off when the weather turned cold.

That seemingly direct thought resulted in a three-year odyssey that led us to multiple engineers and system fabricators in quest of a workable solution. The irony is, what now appears to all the world to be a simple, retractable acrylic panel – perhaps the least visually arresting element in the entire project – was by far the most difficult effect to achieve.

And as we fiddled and fussed with that sort of detail, we had to attend to numerous other design issues having to do with the pool house – including the task of figuring out how to fashion a swim-up passage from the outdoor pool to a cave-like sauna area positioned inside the structure. This passageway, too, was finished with a striking tile mosaic that captures the spirit of prehistoric cave dwellings.

As you can see, at the same time we were being asked to deal with innumerable formal details and technical issues in some areas, we were constantly caught up in a design scheme that was remarkably fanciful and fun in other ways as well.

The swim channel can be sealed when the weather cools off by means of a large acrylic panel that drops down into the water – a comparatively simple-seeming detail that represented months of engineering and fabrication. Outside, the channel flows beneath a small bridge that marks the start of the outdoor swimming lane.





There's another, secluded passage from the outdoor pool that leads to a sauna inside the pool house. Closed off by a rain curtain at one end, it leads bathers through a dark corridor that opens into a cozy space decorated with tile replicas of cave drawings – perhaps the most whimsical of all the spaces in the project.



The outdoor pool is as free in form and spirit as the indoor pool is measured and controlled. With its irregular shape, the mosaic reef serving as an elaborate lane marker and a curving vanishing-edge detail, the pool is surrounded by lush plantings and beautiful hard-scaping in the form of boulders and flagstone decking.



Among the last details we tackled was installation of a variety of sculptures both in and around the watershapes. They bring a measure of sophistication to the setting while lending the gentle sounds of moving water to the outdoor pool's broad upper level.

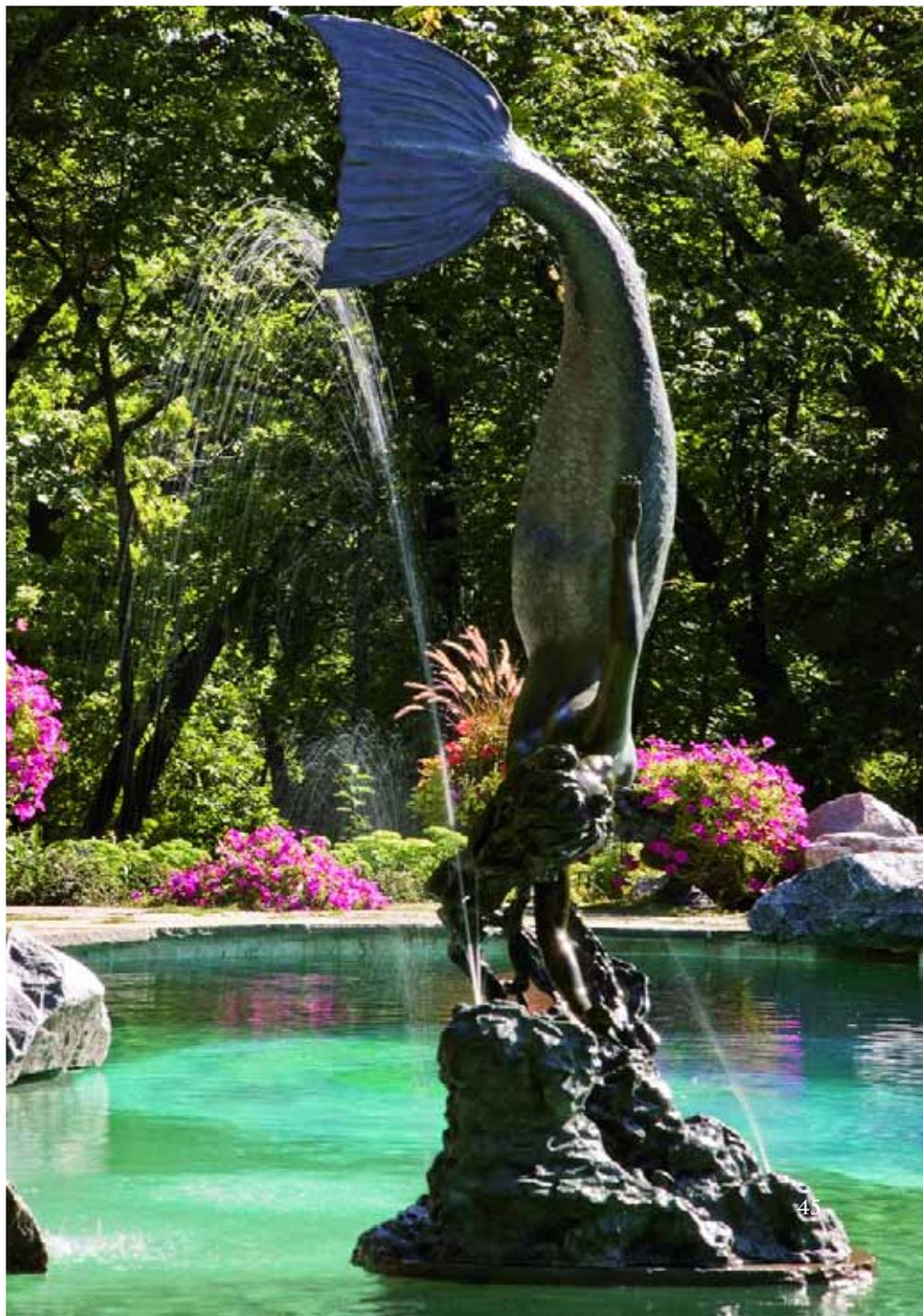
This playfulness is fully on display in the free-form outdoor pool: Although the interior and exterior pools were connected by a narrow swim channel, the two vessels really couldn't be much different in visual character. Where the indoor pool is distinctly formal and ornate, the outdoor pool and its surroundings are decidedly free-wheeling and rustic.

Once again, a prime design element of the outdoor composition came courtesy of a mosaic-tile reef by Craig Bragdy Design. This time, however, the design concept features a visual theme that fits right in with a swimming pool in the form of a coral reef teeming with fish and underwater plants. (In a more utilitarian vein, the client wanted the reef to serve as a sort of giant lane marker that would define a clear path to and from the channel connecting the two pools.)

In addition to that eye-catching detail, the outdoor pool also has a curving, 20-foot-long vanishing edge that spills into a six-foot-wide basin that defines a terrace six feet below the pool's grade; hot and cold water hydrotherapy spas; an outdoor wading pool; a rocky cascade; and sculpture pedestals that include lighting, water and fire effects. All of this is surrounded by and interwoven with natural stonework that includes boulders, river rocks, and beautiful flag-stone decking.

Never Finished

The final stage of our involvement in the project had to do with selection and installation of the sculptures, which by comparison to the long road we'd followed to commissioning the watershapes was a simple, straightforward process.







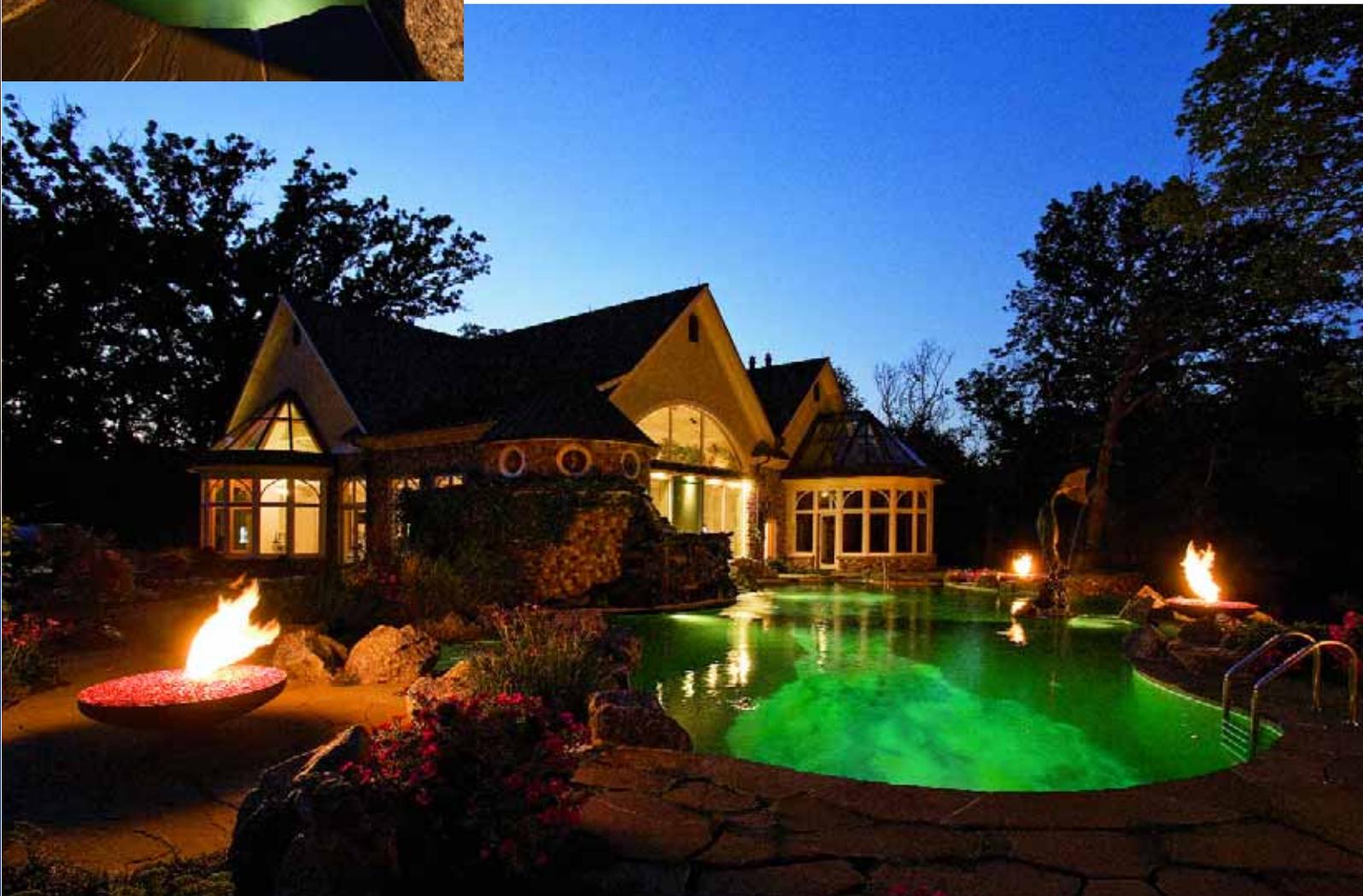
Indeed, dialing in the operation of this complicated set of watershapes and peripheral features is still something of an ongoing mission – one facilitated by the fact that our firm services the property. Being on site regularly and having the opportunity to observe system performance over time has enabled us to adjust and refine countless details related to visual effects, water treatment and energy consumption.

I wouldn't quite call it a "work in progress" at this point, but I suspect that, given the dozens of changes mandated during the approximately 1,800

days we spent designing and building the project and knowing the intensely creative nature of the client, I also wouldn't be the least bit surprised to find ourselves back on site at some point to do more than clean filters and tweak system operation.

For now, however, we're all happy to sit back and evaluate what we've done without the daily pressure of keeping up with a near-constant workflow filled by changes and expansions. Will we ever encounter a project like this again? I hope so – with or without the big clamshell.

At night, when the lights and the fire features come on, the indoor and outdoor spaces come alive with renewed drama. From the starry sky over the indoor pool to the illumination of the underside of the pearlescent clam shell and from the reflections of the fire across the water to the soft glow of the outdoor pool's lighting system, it's all a wonder to behold.



Harvesting Rain

At a time when droughts seem to be aligning with increasing populations to ratchet up the pressure on our supplies of fresh water, the concept of using ponds and streams to capture and store rainwater is one whose time may well have come. Here, Aquascape's Ed Beaulieu describes the installation of a prototype rainwater-harvesting system in a backyard in drought-plagued Georgia, where fresh water has recently become a precious commodity.

By Ed Beaulieu

Only three percent of the world's water exists as *fresh* water – that is, water with low salinity and total dissolved solids of the sort found in lakes, rivers, reservoirs, ponds, streams and aquifers. It is arguably our most precious resource because, quite simply, we can't get along without it.

As populations grow around the world, the amount of fresh water available for drinking, irrigation, bathing and sanitation annually decreases on a per capita basis. These fresh-water supplies are replenished only by precipitation, so when droughts disrupt historical weather patterns, there's trouble ahead – especially if the shortages hit highly populated areas.

Today, it is estimated that one in six people on our planet lacks access to an adequate water supply. While the vast majority of those who endure this disadvantage live in other parts of the world, we in the United States are becoming more and more subject to supply shortages when localized droughts occur. Recent conditions in the southeastern United States are a prime illustration

of what this entails: In Georgia, for example, water supplies recently hit 50-year lows.

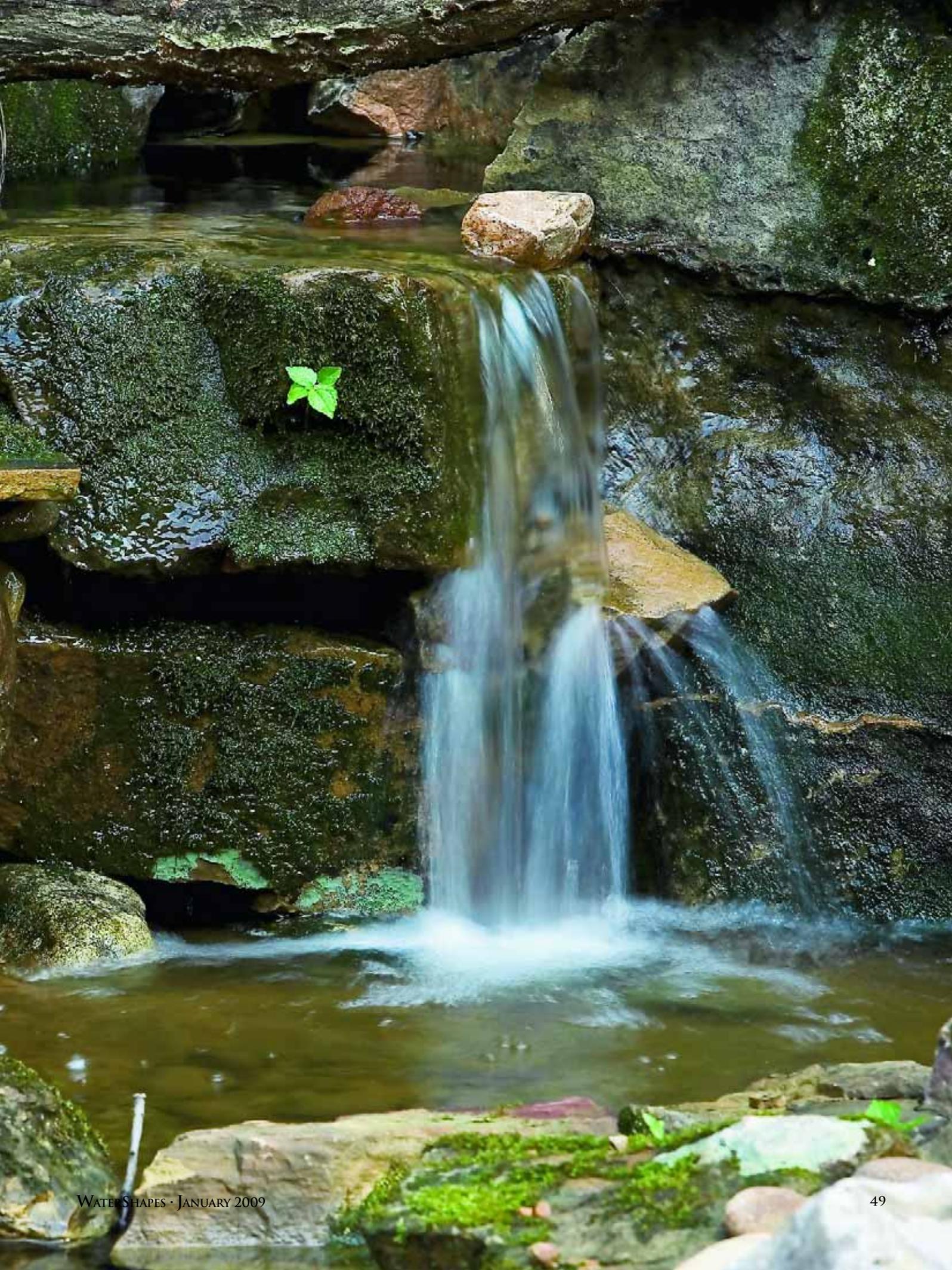
These conditions resulted in the imposition of all sorts of restrictions on water use, in some areas leading to bans on the installation of new watershapes. At Aquascape (St. Charles, Ill.), we've long believed that it's our responsibility as professional watershapers to act responsibly in such circumstances, meaning in our case that we've devoted considerable energy to developing systems that help conserve water.

Such measures serve not only the interest of firms that want to keep installing their watershapes, but also meet growing demand among consumers for conservation-conscious features that make optimal use of available water.

That's why, in 2008, we introduced a rainwater-harvesting system that can be installed in conjunction with various types of ponds, streams and waterfalls. It's our view that, by capturing rainfall on residential properties, we can contribute substantially to reducing waste in the use of fresh water.



Photo by Scott Tasker, Smyrna, Ga.





Work on site began quickly with the digging of the vault for the water-storage system – a nine-by-12-foot pit five feet deep – in which we installed liners and the fittings needed to draw down the reservoir and move the water where we wanted it to go. Once this was taken care of, we installed 80 AquaBlox units to contain the water and provide support for the rockwork and landscaping with which we intended to conceal the basin.

A Perfect Setting

Last spring, we installed the system prototype at the Grantville, Ga., home of Tony Sargeant, owner of Aquatic Creations and one of our certified contractors. He had recently finished building his dream home and, being a watershaper, had naturally envisioned a beautiful waterfall system coursing through his wooded backyard.

Through the first several months of the year, unfortunately, there was a statewide ban on all features with running water, the exception being ponds that sustained fish and other life forms. Hearing of the situation, I contacted Sargeant early in 2008 to ask if he'd be willing to let us install our first rainwater-harvesting/storage system in his yard. I cautioned him that the system was still in development, but he jumped at the chance to have us work with him on a signature watershape that would beautify and complete his property while also dealing responsibly with drought conditions.

A gracious host, Sargeant was also willing to open his home to other contractors who wanted to learn about these systems. Coincidentally (and fortunately), while we negotiated the details the rains finally came back to Georgia: The ban was lifted and we scheduled a training session and installation at Sargeant's home for April 2008.

An accomplished pond/stream professional, Sargeant had sketched out plans for his waterfeature, taking into consideration where he and his wife would spend most of their time outdoors. His property sits on a hill that slopes diagonally across the backyard, lending itself perfectly to a pondless stream-and-waterfall composition that would face the back of the home. Woods ring the property, providing a perfect backdrop for such a system.

His drawings included four small waterfalls and streams that eventually joined

With the main rainwater-harvesting/storage features in place, we proceeded to work on the waterfalls and streambeds, mostly following the sloping contours of the property but also using the spoils from excavating the storage basin to augment the elevations in key places. Beyond the storage capacity, we also created an overflow system – a 350-gallon infiltration trench that controls the release of excess water into the surrounding soil and aquifer.

together as one main stream. As with rivers that slice through gorges in the mountains, the streams were to be coarse and fast-moving at the slope's highest elevation and would gradually slow and widen as they came together near the home's glass-lined back wall. There was to be a stone bridge across the waterway at a relaxing point where the flow became slow and lazy.

To maintain a connection with the woodland area, the design included natural stones that would lead from the home's driveway to the patio as well as a stone wall that was to encompass the patio. He also included a small waterfall that would cascade over the patio wall





before flowing into the main stream.

Completing the composition was a second walkway across the stream that would lead to a fire pit and seating area – perfect for small bonfires on crisp Georgia evenings during football season. The seating was made up of flat stones, and he'd settled on Tennessee fieldstone and smooth River Jack rock to enhance the natural appearance of the setting.

In reviewing his sketches for this 110-foot-long waterfall/stream system, we immediately recognized that it was an ideal situation for installing the prototype of our rainwater-harvesting system.

Coming Together

As we saw it, the pondless waterfalls he wanted would aid our cause by adding much-needed aeration. Further, the natural slope would make it easy for us to direct much of the rainwater falling across the entire site to our underground rainwater-storage area. The one difference Sargeant might not have anticipated had to do with excavation of the site, which would be more extensive than he was accustomed to in installing typical waterfall/stream systems.

With a final sketch in hand, we ordered our supplies and organized the training session that was to run alongside the installation process. More than

45 contractors signed up, which encouraged us to think that the system would be well accepted if everything worked as planned. With lots of helping hands in attendance, we blocked out three days for construction from start to finish.

On the first day, there were just five of us on hand, and we worked at excavation from noon until we ran out of daylight. The next day, most of the other contractors arrived, and we started our work at the bottom of the slope and proceeded up the hill. The key at the bottom was the basin for rainwater storage: To shape it, we'd dug to a depth of five feet and formed a vault nine feet wide by 12 feet long.



The red Georgia soil was redistributed to other areas to enhance various upstream contours of the feature – not only efficient but also good environmental-design practice. We then laid out the plumbing that would run from the pumps in the vault and set up biological filters atop the slope that would fill and overflow to initiate the waterfalls and streams.

We were surprised that we'd been able to set most of the stone on the first day, using just the small early crew. Approximately 60 tons of stone were used and had all been sourced from within 500 miles of the property – yet another of the many sustainable-design features of this project.

With most of those who were on hand for training arriving on the second day, that was when we focused on showing them how to install the rainwater-harvesting/storage system. We kicked off the day with a brief, hour-long seminar on stormwater management and its benefits – important information these contractors would need in convincing their



Lots of the rainwater falling on the landscape has the opportunity to find its way into the harvesting loop, but the largest direct contribution to the reservoir comes from rain that falls on the home's roof and flows to its downspouts. To capture that water at the bottom of the system, we set up a pre-filtering unit that allows water to flow directly to the reservoir. Seen to the left of the completed installation is a booster pump that feeds water to a hose bib and allows the homeowners to use some of their stored water for irrigation.



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clients of the value of the new system.

In addition, we introduced them to an online calculator we'd set up to help contractors determine project requirements – including details on how much water is generated during a typical rain event, 30-year rainfall data for specific regions, keys to sizing of storage basins and much more.

Finally, we turned the focus to the specifics of the project at hand, using Sargeant's waterfeature to familiarize those in attendance with some of the practicalities involved in system installation.

Anatomy of Conservation

Moving into construction mode, we lined the storage basin with a 45-mil

EPDM liner and filled the space with 80 of our firm's AquaBlox Matrix units to create a rainwater-storage capacity of 2,500 gallons.

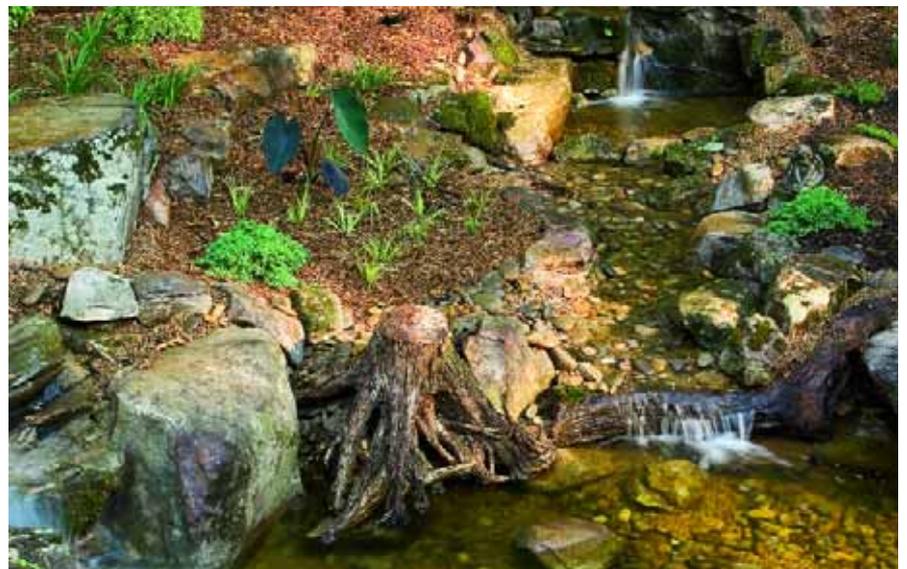
Made with recycled materials, these modular units have 95-percent void space to maximize water storage. A key advantage is that they are small enough that they can be used to line basins of any size or shape – whatever is required to meet a project's specifications. They also support weight to a level of 38 pounds per square inch, yet they're lightweight and install quickly with a bit of on-site assembly.

Large river rock was shoveled in around the units, both to provide stability and to offer some additional filtering surface. We also set up our company's

Snorkel Vault and Centipede Module to improve water quality and aid in sediment removal.

To one side of this core storage area, we added an overflow basin to accommodate the need that might arise in a heavy rainstorm. This was a channel two feet deep, two-and-a-half feet wide and 12 feet long that we lined with geomembrane, six more AquaBlox units for water storage and gravel. The fabric allows water to percolate into the ground and recharge the local aquifer.

We established two points of entry to guide rainwater from the home's roof system and into the collection system. The downspout closest to the storage basin flows to a buried filter that removes



Photos by Scott Tasker

a variety of pollutants that might otherwise be flushed into the system – leaves, twigs, seeds, bugs and other materials that accumulate on the roof and in the gutters between rain events.

A four-inch pipe runs from this downspout filter to the underground storage chamber. To handle any overflow, a two-inch restrictor pipe leads into the 350-gallon-capacity infiltration trench. (The use of a smaller pipe into the trench is instrumental to slowing the speed of water as it moves into the overflow area.)

The second point of entry from the roof flows through a downspout located near a driveway that passes close by the top of the waterfall/stream system. Stormwater exiting this downspout flows

directly into the waterfeature, where it's filtered and aerated by tumbling along the waterfalls and streams and comes in contact with the biologically active gravel bed and the roots of aquatic plants.

This downspout water then enters the final storage chamber, where it is further filtered before being pumped back up through the biological filters. Three pumps (one of our 8PL Tsurumi pumps and two of our high-efficiency AquaSurge 5000s) manage the task of moving water back to the four waterfalls at the top of the slope.

In addition, to tap into the storage system to allow for watering the landscape, we placed a booster pump on a brick pad near the first downspout's filter. This pump increases the water pressure up to

While the rainwater-harvesting/storage system is a key functional detail of this installation, the designer/homeowner had a definite focus on aesthetics and on making his backyard represent his skills and ambitions. But now, where such a system would ordinarily have lost on the order of 600 gallons per month to evaporation, the storage system has let him maintain the feature without substantial additions of municipal water – even through extended periods without any rain.

50 psi (the same pressure as garden hoses) for basic irrigation and is available for connection to various high-pressure irrigation systems. In this case, we set up just one of these booster pumps. If needed, we could have set up several around the yard to provide ready access for remote garden-irrigation systems.

Fired Up

On the third and final day of installation, our crew of approximately 45 finished grading the site and tweaked rock placement for the waterfalls. A victorious cheer spread through the group as the falls were turned on and the water tumbled down all four waterfalls before flowing into the main stream. We spread mulch and took care of landscaping details before breaking at noon to relax and admire our environmental handiwork.

As mentioned at the outset, this was the first of what we're sure will be the installation of many such rainwater-harvesting/storage systems. While this one works with a decorative waterfeature, we know the applications for freestanding (and not necessarily decorative) systems may be just as numerous because these systems are useful for more than merely replenishing water in decorative watershapes. Indeed, rainwater harvesting can, as mentioned above, be used for irrigation; in addition, it can be advantageous in working with environmental code compliance.

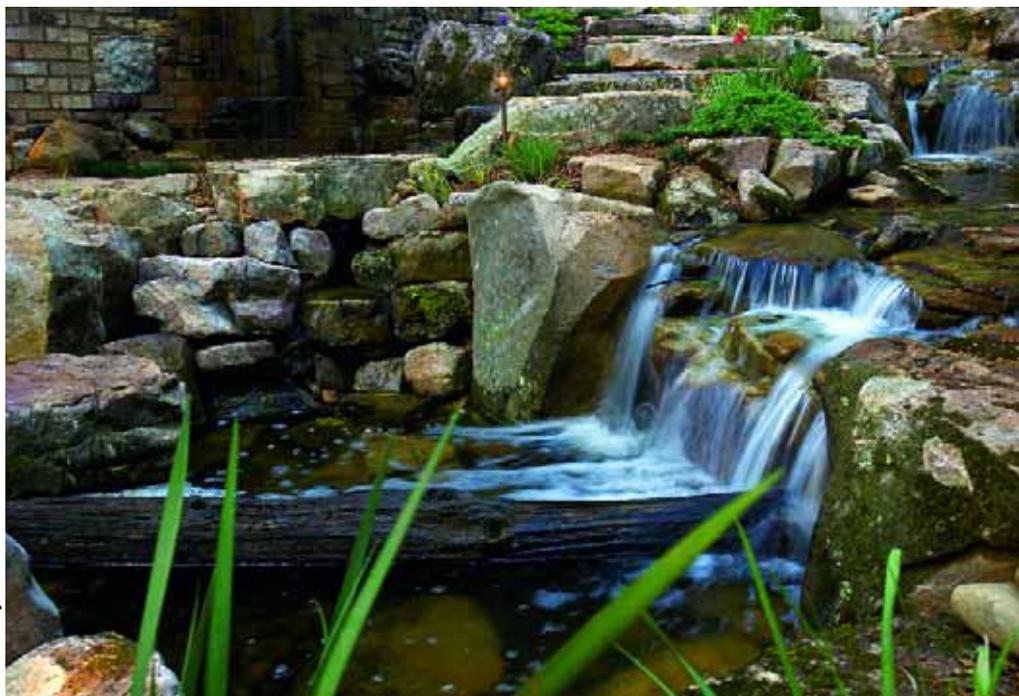
We're confident that this type of supportive, responsible, ecologically oriented approach to watershaping represents a significant advance in system design and should be considered as watershapers move forward into a future where water conservation is certain to be increasingly important.

The contractors who joined us in Georgia worked tirelessly to complete the project in just three days, and while everyone was motivated to help a fellow pond builder, it's certain that all who joined in gained valuable hands-on experience in installing this earth-friendly feature.

Several months after the system was installed, I gave Sargeant a call to see how things were going. After 35 days with no rain, he said, the unit still contained approximately 1,600 gallons of stored rain-



Day and night, the waterfalls and streams of this elaborate installation have a strong visual appeal, but additional pride comes in knowing that the water – our most precious resource – is being used aesthetically as well as responsibly by virtue of some straightforward extra steps in the installation process.



Photos by Scott Tasker

water and he hadn't added a drop of municipal water to the system since the installation. (Typically, he said, a waterfeature of this size would have to be topped off with about 600 gallons per month to keep it functioning properly.)

He also reported having no algae problems, basically because the stored water stayed cool enough that algae didn't have a chance to grow. (Normally, he would have expected to add regular water treat-

ments to a feature of this size to keep algae at bay.) He also said that the booster pump was supplying most of the water for his landscape needs.

So in addition to being the first on his block to have his own rainwater-conservation system, the proud homeowner now has a breathtaking backyard watershape to complement his new home – and has a showcase he's using to demonstrate the system's value to his clients.

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Awakening a Dream



Certainly one of the world's most unusual watershaping achievements, 'Le Rêve' is a Las Vegas-style aquatic production that carries audiences into an amazing dream world of water, light, music and incredible acrobatic skill. To achieve the water effects, former Cirque du Soleil producer Franco Dragone turned to Aviram Müller and Canada's Karajaal – and the result is a marriage of watershaping art and technology unlike any other.

By Aviram Müller

Franco Dragone's design team first contacted me late in 2003. His company, which organizes groups of design firms to create some of the world's most elaborate stage productions, was working on a new Las Vegas extravaganza for hotelier Steve Wynn.

Wynn's properties are famous for their water effects, including the wonderful fountains in front of Bellagio on the Las Vegas Strip. I was told that his then-current project, the Wynn Resort, was to include similarly spectacular water elements – one of which was to be an aquatic theatrical production known as "Le Rêve" – that is, The Dream.

Dragone is perhaps best known as one of the visionaries who created *Cirque du Soleil*. In striking out on his own after more than a decade's association with that phenomenally innovative troupe, he saw "Le Rêve" as the ultimate achievement in theatrical spectacles and assembled a design team capable of rising to new heights.

By the time I spoke with Michel Crete, Dragone's Montreal-based chief designer, in 2003, the team was already deeply engaged in production design and had reached a point where realities and practicalities needed to be addressed. My design firm, Karajaal, had the important advantage over other ca-

pable aquatic-design companies of being located in the Montreal area: Dragone saw proximity as being as important to effective collaboration as were independence, flexibility and artistic imagination.

In our first meeting – an interview, basically – we found good chemistry almost immediately and agreed to work together. The ensuing year and a half of development would prove to be extremely challenging. Ultimately, however, it was all extremely satisfying.

In the Round

As soon as we came on board, we were immediately confronted by a number of working constraints: All of the elevators and platform structures that constitute much of the staging for the show, for example, were already in place (and, perhaps more important, had been accepted and approved by the production's insurance company). Even the pumps had already been selected and installed. As a result, we were forced to invent highly creative effects within a predetermined framework.

The narrowness of those parameters, however, was more than balanced by the production designers' desire to achieve effects that had never been seen before. In fact, we were told to forget

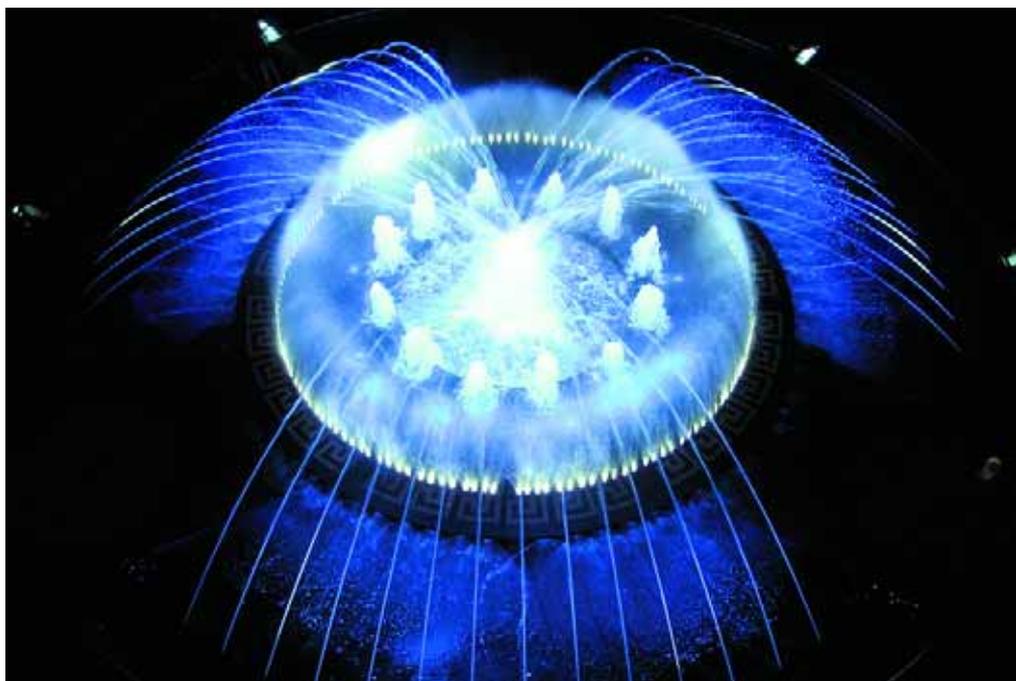
the computer simulation of the production's centerpiece system we'd been shown and were immediately asked to search for the most interesting and creative possibilities available. So even though there were existing conditions we had to accommodate, Dragone had also opened a tremendous creative window for us.

But I get ahead of myself: By way of background, "*Le Rêve*" takes place in a dedicated theater designed solely and exclusively for this one production. It includes a 2,000-seat amphitheater with a central stage, and no seat is more than 42 feet from the action. Because of this theater-in-the-round configuration, there's no backdrop: All performers and production elements either appear from below the water or descend from the ceiling.

The "stage" itself is a circular, poured-in-place, reinforced-concrete basin 60 feet wide and 30 feet deep. It contains approximately two million gallons of water and is set below a massive cupola that rises 30 feet above the water level. This cupola carries lights, rigging and other staging equipment (including a variety of illuminated forms) and is also fitted with four big video screens that cover its entire surface and are used throughout the performance. In addition, the rigging features a video sphere along with flying mannequins, fire and snow effects and more.

Moving in three dimensions through this space are 86 performers – all of them world-class gymnasts, divers and circus acrobats who accomplish near-superhuman physical feats within a constantly changing environment of special effects. Indeed, for all of the mastery and dazzle of the theatrical systems, the movement and artistry of the performers is ultimately what animates the production.

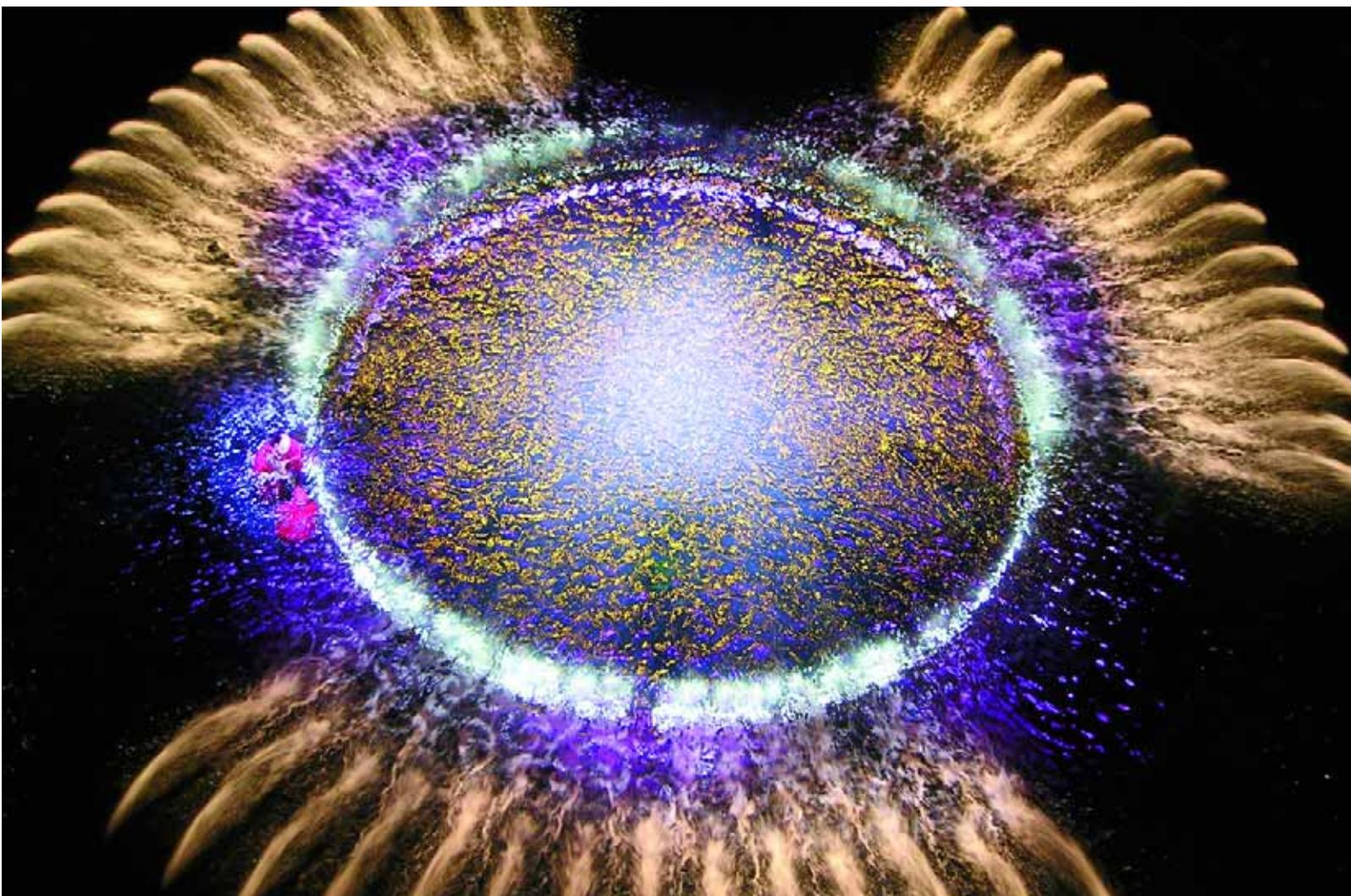
And to say the production is *animated* is to put it mildly. It was a situation in which physicality, artistry and engineering had to work fluidly together – and did so in remarkable ways. Much of the credit for the show's integral vitality goes to Michel Crete, with whom I collaborated closely and who is famous for his work on *Cirque du Soleil's* "O,"



which in some ways served as a precursor to "*Le Rêve*" (but with simpler aquatic elements).

Crete is himself a talented designer who works easily with both nuts-and-bolts technical issues as well as purely aesthetic concerns – often simultaneously. I, too, have both an artistic and technical background, so I was comfortable in his kind of creative environment.

The complex fountain effects take on new significance and drama when acrobats interact with the water across multiple staging levels. The unique achievement of this theatrical production is the way the systems have been devised so that there's nothing entirely automatic: The timing of each effect is controlled on the spot by a team of technicians who watch the performers and make minute adjustments to coincide with what's really happening 'on stage.'





Precise Theatrics

From the start, everyone involved with the water effects was thinking about how the movement of the water would affect an audience. For his part, Wynn wanted to make a dramatic statement that would be as spectacular as (yet different from) Bellagio, whose fountains are so elaborate and *engrossing* that the same people keep coming back to see them over and over again. We wanted to operate on that level, creating a theatrical event a viewer would happily see several times because the complexity of what they were observing would repeatedly and constantly engage both their imaginations and memories.

Of course, artistic achievement at that level requires a tremendous array of precisely designed, installed and controlled technology. Behind each individual effect, in fact, is a dedicated, complex and sophisticated system, expertly run and maintained by one of dozens of talented technicians.

Simply moving all that water requires a staggering amount of energy: The aquatic systems are driven by banks of pumps ranging from 5 to 500 horsepower, every unit with a variable-speed drive to accommodate the different op-



erating conditions encountered during a performance. Just as impressive, the lighting system has a two-million-watt capacity and is made up mostly of low-voltage LED fixtures both for safety in and around the water and for efficient managing electricity use.

Inside the basin are elevators that raise and lower five platforms on both sides of the waterline, and each of the five carries a variety of water-effect elements including spray jets, sheeting waterfalls, rain curtains, fog effects, dancing verti-

cal plumes and more. When all the platforms are raised, they cover about two-thirds of the basin's surface area.

The platforms rise from the water on hydraulically driven telescoping/scissoring mechanisms, with varying combinations of their water effects already operating. The main supply lines are stubbed up on the basin's floor, where they are connected to flexible tubing that moves up and down with the platforms. These tubes run to various manifolds on each of the platforms,



The skills of the acrobats are truly astonishing as they move through a challenging environment and deliver performances that are athletic, exciting, sensuous, daring and awesomely entertaining. That they do so in such intimate interaction with water and in constantly changing conditions is a tribute to their physical abilities – and to the imaginations of those who organized and devised the show.

Into View

Within this general framework, we faced enough specific and unusual technical challenges that I could easily fill a book. The center platform, for instance, is 15 feet in diameter and rises 10 feet above the water level, and we needed to install raindrop and waterfall effects around its perimeter.

The challenge was that we only had an inch and a half of space within the steel frame at our disposal. This meant we had to figure out how to fit the waterfall fixtures, which normally would be a minimum of three inches wide, into a space half that width. We also had to figure out how to distribute the water evenly around the entire common manifold so raindrops would all be uniform in size at each orifice.

To make it happen, we custom-fabricated a PVC manifold that we wrestled into the structure. This small manifold contains a system of special guides that ensure even flow around the platform, and we set it up to be fed by multiple intersecting pipes connected to a central flexible pipe that travels up and down with the lift. This was typical of the challenges we faced with each platform: They *all* needed multiple manifolds, feed lines and jet fixtures, and everything had to snake around conduits feeding the platforms' complex lighting systems.

Adding to the challenge, of course, was the fact that everything we did would be in relatively plain view of the audience. We wanted to minimize visual distractions, so we did all we could to bundle, tuck, mask and jigger all of these systems into extremely compact spaces – always without compromising function or reliability in any way.

It was an arduous process. I made

making the bottom of each a complex mesh of plumbing, cabling, chambers and rigging.

The variable-speed pumps are programmed to provide varying flows to match the ever-changing demands of the show. As the platforms move up and down and various features actuate or rest, each one may operate at a different flow rate depending on the needs of the show's choreography and will automatically adjust to create the desired effect. There are literally hundreds of dif-

ferent configurations, each with a different hydraulic specification.

All of the pumps were manufactured by Paco Pumps (Brookshire, Texas), while much of the fountain equipment was provided by Crystal Fountains (Toronto). We also used a number of industrial fixtures from IMS (Toronto) to create effects not found in standard fountain technology; in addition, we ended up fabricating a number of components ourselves to suit a number of unusual applications.

three trips to the site, each of them three weeks long, to address a variety of specific details. In one case, for example, we discovered a problem with water uptake by flexible waterfall boxes in the round “cliffs” of the platforms: They absorbed so much water that the fixtures undulated under pressure and eventually broke apart. We had to replace all of these units immediately with ones made from marine-grade polyurethane – a process that meant we had to spend a full three weeks reinstalling and reconnecting hundreds of these waterfall boxes.

Another unusual problem: Many of the manifolds, which numbered in the hundreds, were damaged in shipment from the manufacturer in Quebec. This meant that we had to reconstruct many on site, every single one of them to precise specifications.

While some of this installation work was done with the basin empty, much of it could only be done with it full of water so we could see what worked in the diving envelope and what didn't. We met often, learning what posed problems for the acrobats and making adjustments. Suffice it to say that my visits were challenging and filled with extensive problem solving and inconceivably precise system refinement.

Final Adjustments

Unlike almost all other watershapes, the systems we developed for “*Le Rêve*” were conceived as part of a live performance in which human beings would constantly interact with the features, fixtures and equipment. As a consequence, there was a six-month period leading up to the show's premiere during which we worked directly with Dragone and his installation crews on site at various intervals, running through hundreds of technical and aesthetic issues while always considering the needs of the production as well as the safety of the performers.

Through this period, he steadily added, modified or replaced various elements of the show and was always challenging us to come up with fresh ideas and solutions. Sometimes this meant no more than adjusting cues in the computer-driven show controls, but often it led us to reconfigure some of the equipment on the fly.

It was a period of tremendous motion and invention in which each of the effects had to be calibrated with extreme precision so each would deliver exactly the amount of water the production designers wanted to see. At the same time, we needed to build in enough operational flexibility to accommodate the immediate needs of each scene as well as slight variations in performance. This was a *huge* challenge: They wanted the show to be precisely programmed, but at the same time, they wanted us to recognize that they were working with live performers, not robots.

Avoiding this programmed, robotic impression was crucial to Dragone, so while there are multiple computers that control all of the various lighting and water systems, each effect or sequence of effects is nonetheless managed by technicians who initiate the programs in response to what's happening in the performance. In that sense, “*Le Rêve*” is an extreme example of technology interacting seamlessly among system operators, human performers and divers.

Once most of the theatrical effects (including the water) were fully organized, Dragone spent another several months refining the show – working with performers, adjusting the sequences of effects and at just about every turn requesting various system adjustments.

He is a passionate, creative man, and he established a working environment in which everyone involved was at the ready to respond to the flood of decisions he was making.

The human element was a *constant* factor and continuously affected the way we developed and adjusted the systems. Indeed, we invented multiple features that were never included in the show: We found, for example, that we had to stay away from heavily aerated white-water – a cool effect to an observer, but one we set aside because the performers couldn't see through it.

We ran into the same sort of problem with a fog effect that was originally part of the production. The idea was that this large cube of bars with atomized water would appear with a trampoline inside it: After a day of rehearsals, the acrobats complained that they lost sight of the bars because of the fog and the intense lighting. Dragone had needed convincing to try the apparatus in the first place and soon concluded it was too dangerous.

Show Time

All of this effort led to the show's eventual opening on May 6, 2005. By that date, the systems had been up and running reliably for more than 12 weeks – part of the mandate from the beginning.

“*Le Rêve*” still runs twice daily, five days

Preserving the Wonder

A system as complex as the one described in the accompanying text requires a tremendous amount of careful maintenance: Each performance works only if there's perfect functionality, so there's never any room for error and every aspect of system performance and operation must be monitored constantly and repaired if necessary.

This is why, every morning, a team of divers goes through a detailed checklist, making certain that all components are in working condition and not showing appreciable signs of damage or wear. The variable-speed pumps get the same treatment: Technicians constantly monitor their output and adjust each one as necessary. If malfunctions crop up, pumps are immediately pulled, replaced and set aside for eventual repairs.

Once each year, the basin is drained and cleaned, and much of the equipment is disassembled for internal inspections. With maintenance routines like these, it's easy to see why, since the show's premiere in 2005, there has never been a system failure during a performance.

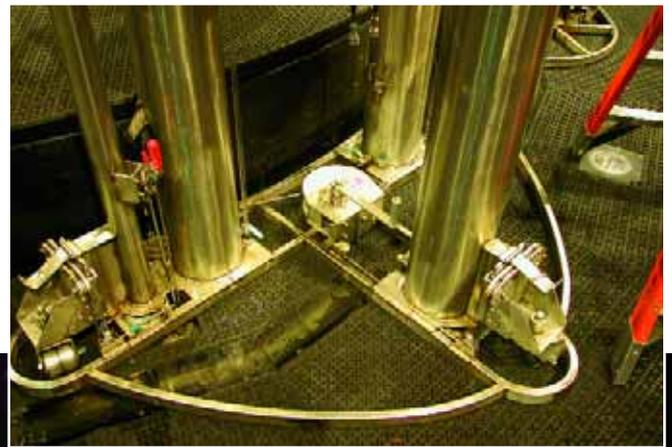
– A.M.

a week, giving the performers a much-needed two-day break. The show lasts about 75 minutes, which is a grueling schedule for the performers, the production staff and the equipment. Indeed, the entire production is a marvel of physical endurance and technical reliability on all levels.

Through it all, however, the most amazing feature of this extraordinary production is the effect it has on its audiences. I've seen it dozens of times, and even as one who understands the technical specifics of the production and knows exactly what's going on and when, I'm still absorbed every time I see it.

It's extremely gratifying to witness how audiences new to the experience respond with awe and wonder each time the music comes up, the lights go on and all these amazing systems and gifted performers run through the production's many phases. Ultimately, I would say that "*Le Rêve*" lives up to its title: It's very much like dreaming with your eyes open!

Behind all the theatricality is a core system of elevators that had to be immediately responsive to every technical demand – on the one hand as fully functional platforms for waterfeatures, and on the other hand as structures that would stay out of the way of the performers and offer no significant visual distractions to audiences. It was a remarkable balancing act, and seeing it even now is a thrill – in all ways a dream come true.



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12	Craig Bragdy Design (pg. 34) 011 44 1745 815656 (United Kingdom) www.cbdpools.co.uk
18	Crystal Fountains (pg. 14) (800) 539-8858 www.crystalfountains.com
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MISSING ANY?

☐ **February 1999 (Vol. 1, No. 1)**

Tisherman on working in difficult soils; White on edge treatments; Lacher on expansive soils.

☐ **June 1999 (Vol. 1, No. 3)**

Phillips on water and decks; Parmelee & Schick on soils and geology; Anderson on water sounds.

☐ **August 1999 (Vol. 1, No. 4)**

Anderson on stream design; Adams on community waterparks; Gutai on spa hydraulics.

☐ **October 1999 (Vol. 1, No. 5)**

Holden on aquatic-design history; Mitovich on dry-deck fountains; Tisherman on site geometry.

☐ **December 1999 (Vol. 1, No. 6)**

Finley on Japanese gardens; a roundtable on pools and landscape design; West on color rendering.

☐ **February 2000 (Vol. 2, No. 2)**

Hersman on lighting design; Macaire on faux-rock installations; Andrews on glass mosaics.

☐ **March 2000 (Vol. 2, No. 3)**

L'Heureux on project management; Long on steel cages; Forni on installing and maintaining lakes.

☐ **April/May 2000 (Vol. 2, No. 4)**

Schwartz on garden access; Anderson on streambeds; Nantz on watershapes and architecture.

☐ **September 2000 (Vol. 2, No. 7)**

Davitt on designing for small spaces; Altwater on the importance of aeration; Hetzner on sheet falls.

☐ **November/December 2000 (Vol. 2, No. 9)**

Arahuate on John Lautner; L'Heureux on stretching laminar flows; Benedetti on satellite surveying.

☐ **January/February 2001 (Vol. 3, No. 1)**

Holden on a retro-look design (II); Fleming on passive approaches; Gutai on water technology.

☐ **March 2001 (Vol. 3, No. 2)**

Phillips on water and decks; Anderson on water sounds.

☐ **October 2001 (Vol. 3, No. 8)**

Tisherman on hilltop views; Hagen on natural stream work; Schwartz on classic stonework (III).

☐ **November/December 2001 (Vol. 3, No. 9)**

Straub on Kansas City's fountains; McCloskey on the Getty Center; Tisherman on Fallingwater.

☐ **January 2002 (Vol. 4, No. 1)**

Phillips on Hearst Castle's watershapes; Bower on the Raleigh Hotel pool; Roth on Katsura Rikyu.

☐ **February 2002 (Vol. 4, No. 2)**

Marosz on project integration; Moneta on spa-edge details; Affleck on sculpture and water.

☐ **May 2002 (Vol. 4, No. 5)**

Anderson on pond essentials; Pasotti on interactive waterplay; Gibbons on 'stellar' fiberoptics.

☐ **June 2002 (Vol. 4, No. 6)**

Altorio on civic fountains; Gutai on skimmers; Beard on working with landscape architects.

☐ **September 2002 (Vol. 4, No. 8)**

Rosenberg & Herman on site-sensitive design; Dirsmitz on long-term design; Gutai on filters.

☐ **October 2002 (Vol. 4, No. 9)**

Copley & Wolff on modernizing fountains; Bethune on imitating nature; Tisherman on edgy colors.

☐ **November/December 2002 (Vol. 4, No. 10)**

Holden on Villa d'Este; Hobbs on Maya Lin's watershapes; Phillips on water in transit.

☐ **January 2003 (Vol. 5, No. 1)**

Fleming on high-end ambitions; Harris on decorative interior finishes; Gutai on surge tanks.

☐ **February 2003 (Vol. 5, No. 2)**

The Beard's on collaboration; Yavis on custom vinyl-tile pools; Mitovich on Mercedes's campus.

☐ **May 2003 (Vol. 5, No. 5)**

Phillips on water and decks; Anderson on water sounds.

☐ **November 2003 (Vol. 5, No. 11)**

Holden on carved stone; Shaw on roles of consultants; Forni on period-sensitive renovation.

☐ **December 2003 (Vol. 5, No. 12)**

Five-year article and topic indexes; five-year index for all columns, 1999-2003.

☐ **January 2004 (Vol. 6, No. 1)**

Ruddy on enclosures; Lacher on steel and concrete; Forni on water quality for natural watershapes.

☐ **February 2004 (Vol. 6, No. 2)**

Varick on nature and architecture; Benedetti on protecting stone; Kaiser on grand-scale watershapes.

☐ **March 2004 (Vol. 6, No. 3)**

Morris on kinetic sculpture; Cattano on collaboration; Heddon on water and settings for healing.

☐ **May 2004 (Vol. 6, No. 5)**

Rowley on main-drain safety; Ewen on purposeful restoration; Dallons on high-wire watershaping.

☐ **June 2004 (Vol. 6, No. 6)**

Dallons on a hilltop treasure; Mitovich on the D-Day Memorial; Slawson on Japanese inspiration.

☐ **July 2004 (Vol. 6, No. 7)**

Benedetti on fortifying concrete; Shaw on fountain 'standards'; Holden on Italy's watershapes.

☐ **August 2004 (Vol. 6, No. 8)**

Bravo on Olympic-scale restoration; Martin & Tester on water and music; Jauregui on clients and styles.

☐ **September 2004 (Vol. 6, No. 9)**

Abaldo on a grand-scale vision; Gutai on valves; Lennox Moyer on principles of fighting water.

☐ **October 2004 (Vol. 6, No. 10)**

dGiacomo & Holden on Wisconsin's epic; Allen on special spaces; Grzesinski on a man's legacy.

☐ **November 2004 (Vol. 6, No. 11)**

Phillips on water and decks; Anderson on water sounds.

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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 66.

DECK-JOINT SEALANT

Circle 135 on Reader Service Card



DECK-O-SEAL offers a polysulfide-based, two-part deck-joint sealant in a pourable, self-leveling formulation. The non-staining product cures at ambient temperatures to a firm, flexible, tear-resistant rubber that is highly resilient and has excellent recovery characteristics after periods of compression or elongation. It is chemical- and weather-resistant and also resists aging and shrinkage. **Deck-O-Seal**, Hampshire, IL.

SVRS-COMPLIANT PUMP

Circle 136 on Reader Service Card



PENTAIR WATER COMMERCIAL POOL & AQUATICS offers the IntelliFlo VS+SVRS pump – a device that reduces operating costs while fully complying with the new SVRS standards. The system, which can never be disabled and has a password-protected lockout feature, immediately detects blockages and automatically shuts itself down within seconds. **Pentair Water Commercial Pool & Aquatics**, Sanford, NC.

NEW COVER MESH

Circle 137 on Reader Service Card



PLATIMAYD POOL PRODUCTS has introduced a new fabric for its pool-safety covers. Known as Ultra-Mayd Mesh, the material has a tighter weave that offers all the advantages of a solid safety cover without a solid cover's weight. It also blocks out more sunlight than conventional mesh covers while filtering out more dirt for an overall cleaner pool when spring comes. **Plastimayd Pool Products**, Oregon City, OR.

Continued on page 70

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RELAXING WATER FEATURE

COMPACT LOADER

Circle 138 on Reader Service Card



CATERPILLAR offers the Model 904H compact wheel loader. Designed for power, versatility and easy, comfortable operation, the unit features reduced emissions, an articulated steering system, more ground clearance, a powerful Z-bar loader linkage, a universal tool coupler, ample cab space and enhanced visibility for taking on difficult loading and lifting chores with less operator fatigue. **Caterpillar**, Peoria, IL.

PLANTABLE RETAINING WALL

Circle 139 on Reader Service Card

VERSA-LOK has introduced the Versa-Green plantable retaining wall system to provide significant soil retention while reducing a retaining wall's visual profile and making it seem part of the surrounding landscape. Each unit weighs 70 pounds, covers nearly a full square foot of wall face and includes a six-inch-deep planting pocket as well as a groove to accommodate irrigation tubing. **Versa-Lok**, Oakdale, MN.



POOL LADDERS

Circle 140 on Reader Service Card

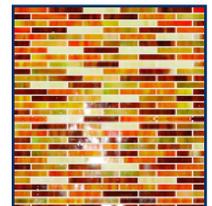


FABCOTE offers a complete line of ladders that can be powder-coated to match any pool décor. The company's in-house powder-coating facility uses an electrostatic process that drives the material into and around all surfaces, evenly and smoothly. This produces exceptionally durable, corrosion-resistant finishes in the ladders, which are made with 304 stainless steel in all standard shapes. **Fabcote**, York, PA.

GLASS-TILE CATALOG

Circle 141 on Reader Service Card

HIRSCH GLASS CORP. has released its 2009 catalog in both print and digital formats. The 48-page, full-color document covers the company's full product line, including new items in the Braided Jewel, Stone Glass Mosaic, GemStone Glass Mosaic and Earth & Art collections. Also included are architectural glass panels and Dazzling Green Glass Mosaics made with 100% recycled glass. **Hirsch Glass Corp.**, Edison, NJ.



BUTTERFLY VALVES

Circle 142 on Reader Service Card

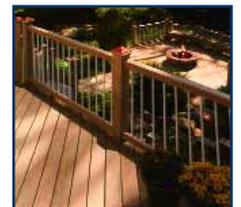


GP PIPING SYSTEMS has introduced the Type 563 Aqua Butterfly Valve, a cost-effective solution for a variety of watershape applications. Made using PVC with an EPDM seal and designed specifically for use in pools, waterparks and other water-features, the units come in diameters from 2 to 12 inches and have either lockable hand levers that move in 5-degree increments or gear-operated wheels. **GP Piping Systems**, Tustin, CA.

DECKING SYSTEM

Circle 143 on Reader Service Card

LATITUDES DECKING & RAILING offers composite, extruded deck and railing products that have the natural look of wood. Designed for superior water resistance, the material is bare-foot-friendly, slip-resistant and resists warping, splitting or rotting. The deck planks come in gray, cedar, redwood or walnut tones and are available with a range of natural and ornamental railings. **Latitudes Decking & Railing**, Prairie du Chien, WI.



PARTY TENTS

Circle 144 on Reader Service Card

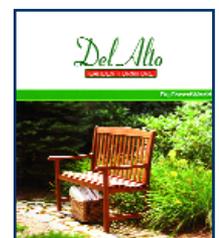


WONDERS OF MOROCCO offers La Farniente, a party tent made for poolside use. Designed as a hospitable gathering place for the enjoyment of the shade (or to maintain a sense of privacy), the tent is easy to assemble, features a galvanized frame and comes with festive fabrics that brighten backyard settings. Available in standard sizes, the tents can also be made to custom specifications. **Wonders of Morocco**, Scottsdale, AZ.

GARDEN FURNITURE

Circle 145 on Reader Service Card

FORESTWORLD has published a catalog on its Del Alto line of garden furniture. The 64-page, full-color brochure describes the company and its environmentally sustainable harvesting of wood in South America before introducing an array of all-wood and upholstered tables, chairs, benches, lounges, loveseats, rockers, planters and more – some with steel or stone details and accents. **ForestWorld**, Greensboro, NC.



Continued on page 72

Introducing The WaterShapes Community



WaterShapes is about to launch a premium, members-only section of our Web site for watershaping's elite! By participating in The WaterShapes Community, you'll benefit from exclusive features and capabilities that will enhance your experience as a watershaper and contribute to your success.

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WATER SHAPES
ONLINE

DRAIN OVERLAYS

Circle 146 on Reader Service Card



QUAKER PLASTIC CORP. has introduced Paver Drain Overlay for the renovation of old drains and decks. The new units install easily over old drains and fit flush with newly applied one-inch-thick paver blocks, thus eliminating the need to dig up old drains or work with replacement caps. In addition, the units' side panels are notched and can be snapped off to fit flush against walls. **Quaker Plastic Corp.**, Mountville, PA.

BUTTERFLY VALVES

Circle 147 on Reader Service Card



ASAHI/AMERICA has upgraded its Pool-Pro line of PVC butterfly valves. The new units, which range in size from 1-1/2- to 10-inch diameters, now have all-plastic gear operators for lighter weight and superior corrosion resistance in chlorinated water. The easy-to-install units are designed for reliable performance, are virtually maintenance-free and accept a variety of operating accessories. **Asahi/America**, Malden, MA.

POOL-MONITORING SOFTWARE

Circle 148 on Reader Service Card



ACU-TROL PROGRAMMABLE CONTROLLERS offers a new software package that allows pool operators or homeowners to view the status of their controllers at any time via the Internet. The system allows users to view pH, ORP, ppm levels, temperature and flow rates of their bodies of water and can also tell them the time and

date that data were last collected. **Acu-Trol Programmable Controllers**, Auburn, CA.

WINTER POOL COVERS

Circle 149 on Reader Service Card



PEN FABRICATORS offers two types of winter covers for pools: a traditional over-the-deck model that fits all pools; and a custom snap-in cover designed for vinyl-liner pools. The first option comes with 20-mil-vinyl water bags that follow the outer edge of the cover to hold the cover in place; the second has a bead that snaps into a special track around the perimeter of the pool. **Pen Fabricators**, Emigsville, PA.

COMPLIANT SUCTION OUTLETS

Circle 150 on Reader Service Card

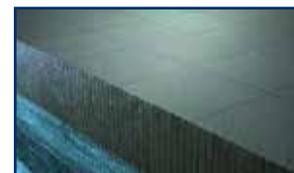


AQUASTAR POOL PRODUCTS offers 17 separate combinations of suction outlets that comply with provisions of the Virginia Graeme Baker Pool & Spa Safety Act. The line includes an anti-entrapment suction-outlet cover rated at 206 gpm that works for round 8- and 10-inch outlets in new-pool and replacement situations and in retrofits

with existing 9-by-9- and 12-by-12-inch frames. **AquaStar Pool Products**, San Diego, CA.

SLATE-TILE PRODUCTS

Circle 151 on Reader Service Card



GRANITIFIANDRE USA has expanded its line with Co.de Exte products for exterior applications. The slate-finish tiles feature tile-to-tile surface variations and four earthy color options (Desert, Moka, Urban and Graphite) suited to minimalist exterior designs. They are available in 12-by-12- and 8-by-8-inch sizes along with coordinating mosaic, bullnose and step-tread pieces. **GranitiFiandre USA**, Itasca, IL.

WATERFALL KIT

Circle 152 on Reader Service Card



ATLANTIC WATER GARDENS has introduced Colorfalls, a kit designed to simplify waterfeature installation by combining all installation components in one convenient package that includes a 24-inch waterfall system (in white or blue), a basin, a pump,

ten feet of 1-1/4-inch flexible PVC pipe and assembly materials (a pump discharge, glue, thread sealant and more). **Atlantic Water Gardens**, Mantua, OH.

PLAY-FEATURE GUIDE

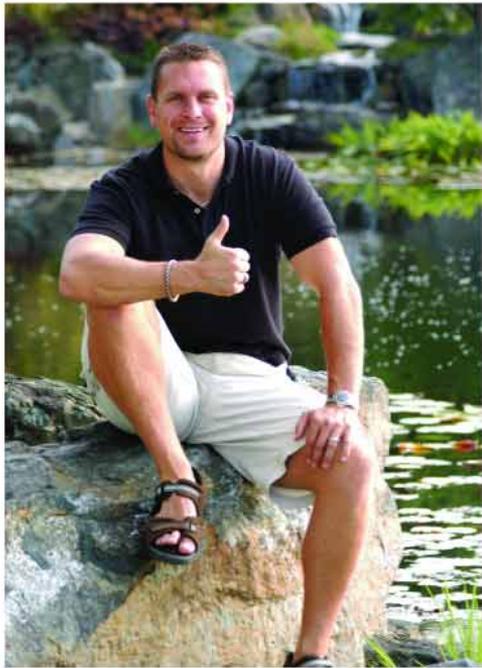
Circle 153 on Reader Service Card

NATIONAL SWIMMING POOL FOUNDATION has published a Spanish translation of its *Aquatic Play Feature Handbook*. This new translation, *Guía Aquatic Play Feature*, offers guidance on how to operate and manage facilities that have waterpark-type features – everything from spray parks and aquatic centers to motels, campgrounds, fitness centers and more. **National Swimming Pool Foundation**, Colorado Springs, CO.



Now at WaterShapes Online...

An in-depth interview with Aquascape founder
and CEO Greg "The Pond Guy" Wittstock:



‘A lot of people out there build beautiful waterfeatures, and they might even be low-maintenance. But there are not a lot of people building beautiful, low-maintenance *and profitable* waterfeatures — certainly not to the level of profitability they need to grow their businesses.’

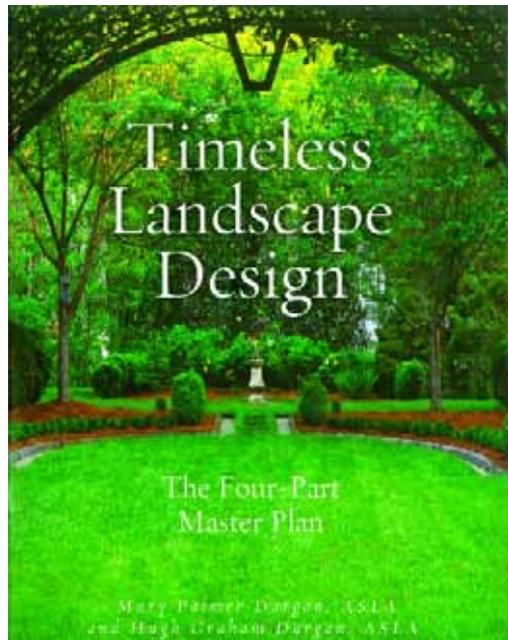
—Greg Wittstock

To read the entire interview, go to www.watershapes.com and click on Interview.

WATER SHAPES
ONLINE

By Mike Farley

The Home Front



When I was a landscape architecture student, my coursework on residential landscape design wasn't much to speak of – just one project in a single course. In those days, in fact, expressing any interest in residential spaces made you something of an outcast who really should have been thinking of loftier pursuits in civic, public and commercial design.

Happily, I've been hearing from some younger landscape architects that the situation is now different – but that there's still no real focus on residential design and a tremendous void when it comes to good, solid information for those who want to know more. And it goes without saying that, when it comes to pools and other watershapes, that void is particularly deep and wide.

Certainly, resources such as *WaterShapes* have helped professionals fill that void, but as a diligent book person, I am always on the lookout for texts that add to the dialogue and do more than skim over the residential-landscape canvas. That's why I was keen to pick up a copy of *Timeless Landscape Design*, written by the husband-and-wife landscape design team of Mary Palmer Dargan and Hugh Graham Dargan (Wyrick & Co., 2007).

They aim at readers who do not have degrees in landscape architecture but who do (or should) have a distinct interest in the topic – nursery professionals, general contractors and homeowners among them. Indeed, the content is a bit basic, but for watershapers who want to address entire residential environments, I see this 190-page, beautifully illustrated book as a useful overview

of how all the pieces can work together.

The Dargans approach the design process by breaking it into four areas:

▀ *The Approach*: They start with driveways, street and sidewalk transitions, front yards and pathways leading to front doors – coverage I found useful because more and more of the projects I design include areas beyond backyards. And they get down to details, displaying some terrific treatments of gates, mailboxes, pathways, landings and steps.

▀ *The Hub*: Here, the Dargans discuss the role of the home itself as a component of the landscape and how its architecture influences the structures and spaces that surround it. They also cover the importance of understanding how to organize exterior spaces to maximize viewing corridors and vistas from inside the home.

▀ *The Perimeter*: This section covers all of the areas and structures directly related to the house – details that provide transitions out to the landscape that include terraces, patios, porches, shade structures, arbors, pergolas and exterior dining areas. Interestingly, they cover pools in this section, pointing out that these can be perimeter elements as well as destinations.

▀ *Passages and Destinations*: Here, they cover design elements that lead us away from the home and out to destinations including lawns, tennis or basketball courts, gardens, gazebos, entertainment areas or other structures and spaces that are somehow removed from the house itself.

Certainly, this isn't an exhaustive text on residential landscape design, but even so, it offers far more information than I ever received in college and seems to me to provide a sound approach to assessing the big picture and finding ways to make all the pieces fit together as parts of a cohesive design.

Again, this may be too basic a treatment for those who've immersed themselves in all facets of residential design, but in my view it never hurts to see how other professionals approach the design challenge. And for those of you who are eager to get into areas beyond watershapes only, this is a great place to start. 



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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.

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



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