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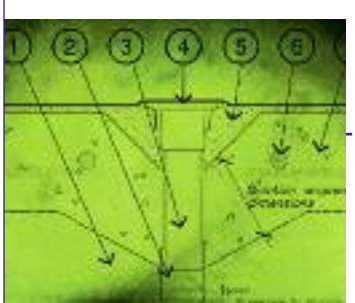

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Greener Grass, Higher Tides

By Eric Herman

Last May, I put a deliberately upbeat spin on market conditions that had prompted *WaterShapes* to switch temporarily to a bimonthly publishing schedule.

The tack I took did not go unnoticed. In the aftermath of our announcement, many of you let us know that you were four-square behind the magazine and offered to pitch in to do whatever you could to help – all of which was and remains most appreciated. But there were others who, in various ways, essentially told me that I was being unrealistic and naïve and that recovery was nowhere in sight – input also appreciated despite its bracing effect.

Now as we swing into a new decade, I'm ready to open myself to barbs from my critics once again.

I think we can all agree that this lingering recession has been deeper than any downturn anyone has experienced since the Great Depression. Some of us have come through hard times better than others, but there's no doubt the suffering has been widespread and profound. For my part, the optimist in me has never let go of the historical fact that economic events are cyclical and that, inevitably, things will turn around. That, of course, has been cold comfort through the past two years.

As 2010 came to a close, however, even skeptics were conceding that signs of recovery were surfacing in the overall economy. It may have been slow and plodding and spotty, but it was progress nonetheless.

A few days before I sat down to write this column, I returned from the International Pool|Spa|Patio Expo in Las Vegas – and I can only hope the energy and enthusiasm I saw there will carry over into the year to come. The show's first day was easily the most active of any such event I've attended in several years.

We were inundated at our booth all day, and most conversations that started with gingerly expressions of "cautious optimism" soon took a turn: Where these watershapers knew it was still too early to say (and they didn't want to jinx anything), almost to a person they were seeing encouraging upticks in the marketplace, especially among upscale clients grown weary of sitting on their money and ready to spend.

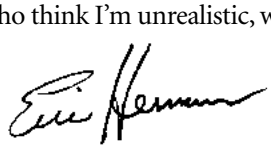
I also heard about lots of long-pending projects that had gotten under way recently because clients were finally able to secure funding that had been excruciatingly tough to get during the past two years. And since I've returned, several people who didn't have time to chat in detail during the show have called to share similar messages of hope and encouragement.

Helpfully, the upbeat tone has influenced manufacturers as well as watershapers, so prospects for *WaterShapes* seem to be brightening a bit as well.

At the risk of again being labeled as a hopelessly deranged optimist, I'm going to step out on a limb and suggest that the coming year will be the one that gives all of us a chance to step away from gloom and doom and toward confidence and success. It's time for the drumbeat of negativity to cease and for pipes of joy to sound.

And let's face it: Defeatism can become a self-fulfilling prophecy. As tough as things have been, I've never let myself go there, never let the magazine shift its focus away from inspiration and toward mere survival, never gave up on the thought that watershaping is a noble activity whose practitioners deserve praise and success rather than the economic lash.

With all due respect to those of you who think I'm unrealistic, why would you have it any other way?



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In This Issue

January Writers

Interested in writing for WaterShapes on design, engineering or construction topics? Contact Eric Herman at (714) 313-6136!

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., and has also appeared on various shows on the HGTV and D.I.Y channels.

Mike Mudrick is product manager at Aquafin, a manufacturer of waterproofing products based in Elkton, Md. A graduate of Temple University with a degree in chemistry, he has been involved in the construction and waterproofing industries for more than 20 years and joined Aquafin in 2000. **Elana Danke** is Aquafin's director of marketing. A graduate of the University of Maryland (College Park) with a degree in marketing, she started at Aquafin in 2005 in outside sales, then spent three years abroad working for the partner company – Aquafin International – doing international marketing and sales support before returning to Maryland in 2009 to assume her current role. For more information, visit *www.aquafin.net*.

James G. Robyn is the president and CEO of BioNova Natural Pools and of Rin Robyn Pools in Far Hills, N.J. A second-generation pool designer/builder, he holds a bachelor's degree in astrogeophysics from Colgate University and a master's degree in business administration and international management with a concentration on Germany. Having grown

up with a shovel in his hand and building swimming pools every summer throughout high school and college, he decided to pursue a career in computers after receiving his MBA and spending most of the 1970s as a systems analyst with Sperry Univac Computer Systems. In 1980, Robyn and his wife, Hae-Sun, rejoined the family pool business. In 2007, they became involved with BioNova (Munich, Germany) and are now its master partner for North America. Robyn is a gold-level member of Genesis 3, an affiliate member of the American Society of Landscape Architects and a member of the Association of Professional Landscape Designers, the Associations of Pool & Spa Professionals and the National Association of Pond Professionals.

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 40 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

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awards and has been inducted into the Swimming Pool Hall of Fame.

Bruce Zaretsky is the owner of Zaretsky & 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 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.

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

Apologies

In preparing "Casting Nature" by Tommy T. Cook (November 2010, page 54), we omitted photo credits as follows: The opening shot (pages 54 and 55), both images on page 56, the middle and bottom images on page 57 and the left and right images on pages 58 and 59 are courtesy Absolute ConcreteWorks (Poulsbo, Wash.). The middle image on pages 58 and 59 is courtesy Laurie Smith. The remaining photograph – on top of page 57 – was taken by the author.

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 the 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 bachelor's 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 designer 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 2006.

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Aqua Culture

Maximizing our future opportunities will require the emergence of a new generation of industry leaders who have the vision, will and energy to execute big ideas.

A Time for Leadership

By Brian Van Bower

In the 40-plus years I've been involved in the pool and spa industry, I've had the opportunity to work with a variety of organizations on the local, state and national levels. Every step along the way, I worked closely with people who displayed a variety of leadership styles and have done my best to perform well when I've been called on to take those leading roles myself.

These experiences leave me convinced that the purposeful leadership of those able to inspire others to share their way of thinking can make a huge difference. These leaders guide an industry or an organization in a positive direction while setting the table for success not just in the present, but for the future. Conversely, I've seen how ineffectual leadership clearly retards overall progress and results in missed opportunities.

As we move into a new decade and, everyone hopes, finally manage to put this overlong recession behind us, it's obvious that these are pivotal times for the watershaping industry. Maximizing our future opportunities will require the emergence of a new generation of industry leaders who have the vision, will and energy to execute big ideas from the grass roots all the way through to the grandest national and international levels.

My sincere hope is that these leaders are ready to step up – and that if any of them are still on the fence, deciding whether or not to get involved, they will find reason and encouragement enough to do so. I further hope that tomorrow's industry leaders have the presence of mind to study the past with an eye toward what has worked and what hasn't.

spectrums of influence

As one who's long been part of our industry's leadership, I concede that making the commitment can be tougher than it seems and that participation can be extremely frustrating at times. But it's also remarkably rewarding at others.

Moreover, I can say without reservation that no leader has to work alone and that what often appears to be the outcome of keen leadership from the top is in fact an expression of the work of an entire, sometimes large group of people committed to a common goal across a range of levels and regions.

I haven't always seen it this way, but leadership is not the sole responsibility of the person in the big chair: Those who get directly involved are important, of course, but true success is in the hands of everyone in the industry. In other words, the most effective leadership is very much the expression of group effort.

My first brush with leadership came during my years with Associated Swimming Pool Industries (ASPI) in southern Florida. Seeing how useful a local group could be in supporting the industry's collective interests, I then joined the Miami chapter of the National Spa & Pool Institute (NSPI), became involved in the Florida region and ultimately served on the national board of directors.

On each of those levels, I saw how much influence leaders have on the culture of the organization – its agenda, reputation and, ultimately, level of effectiveness or ineffectiveness. I also witnessed how some people stood up to controversy and even thrived on it, and how others were overwhelmed when times

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were tough and big questions were asked.

Some of those under whom I served were extremely qualified and purposefully sought positions of power. Others weren't truly leaders at all, but instead were people who ended up in the top chairs either because there was no one else around to fill the slot or because it was his or her turn in the pecking order.

At NSPI, the presidents I worked with were for the most part effective in their own ways. Some who influenced my thinking about leadership include Charles Whitmer, who ran an extremely organized, trim ship; Dennis Chapman, who was far more relaxed in his approach but effective just the same; and Ted Richard, who was truly gifted in his ability to unite people from different factions of the industry by defining common interests.

In Richard's case, I was impressed by the value he placed on having the people on his board get to know one another not only as industry activists but also as people with shared social experiences. I particularly recall an event he organized in 1992 – an amazing lobster bake on the beach in Newport, R.I., where (at their own expense) members of the NSPI board cooked dinner for each other, shared their passion for good food, good wine, good music and good company and for a time turned a contentious crowd into an incredibly harmonious working group.

Indeed, that one event forged effective working relationships that lasted for years to come. And it impressed me enough that a few years later it was instrumental in establishing the culture behind Genesis 3: By sharing experiences outside the hard work of getting educated, we've cobbled together a large family of like-minded professionals.

necessary vision

Regardless of personal style, effective leaders must have Ted Richard's ability to unite people around a shared conceptual framework – or what many of us simply call *vision*. It's not just having an idea about what's going to work and what won't work in the present and the future: Leaders must be able to articulate their ideas and help those around them understand those ideas in ways that connect with the interests of people from many different walks of life.

Right now, to bring the idea up to the minute, we're in an industry that faces immense challenges as well as wonderful opportunities.

We're caught up on the one hand in contending with the influence of government through the Virginia Graeme Baker Pool & Spa Safety Act, which has forced us to be much more active in addressing a range of safety issues. And we face obvious economic challenges as we've watched the mid-level and volume markets disappear during the recession. Here, we need leaders who are committed to engaging in positive promotion of the benefits of owning watershapes for health, aesthetic beauty or as sources of family togetherness.

Leaders must be able to articulate their ideas and help those around them understand those ideas in ways that connect with the interests of people from many different walks of life.

On the other hand, we've seen a tectonic change in what consumers want by way of their exterior environments. As has been discussed in these pages countless times, where people in the traditional pool and spa industry tend to look at their output in isolation, our consumers are, by contrast, seeing pools, spas and other watershapes in the context of an overall spectrum of recreational and aesthetic opportunities. This means that our leaders must understand amenities such as outdoor kitchens, landscape lighting and fire effects and guide watershapers to embrace the entirety of the outdoor experience.

Smart leaders, of course, recognize such trends and amplify the benefits of moving in those directions. There are pockets of resistance, but I think that once and for all we have learned that limiting the scope of what we do and defining our work as a commodity is *not* the best path. Instead, there's real value in great design, beautiful materials, creativity and commitment when it comes to getting consumers involved in experiencing pleasure, health benefits and luxury.

Yes, technical proficiency is absolutely crucial, but we all need to understand the psychology behind the desire to own watershapes. Likewise, we all must know that the most beautiful, thoughtful, meticulous design isn't worth the paper it's drawn on without the solid underpinnings of reliable engineering and capable construction.

And as I have written here recently, we also have a tremendous opportunity to become part of a global network of watershapers. A certain North American isolationism may have worked in the past but is truly silly now: Can there be any question in today's world of instant communication that we are now part of a global network of people united by common interests?

for everyone

Given all of the above, I feel a bit like a politician who has just published a platform to help voters decide whom to support, but that's *definitely* not my purpose here: I'm *not* running for office. Instead, what I hope to do is draw out and call on a new generation of leaders – professionals unshackled by the conventional thinking that surrounded me as I grew up in the industry and who are ready to link up with progressive thinkers in the United States, Canada, Europe, Asia, Australia, South Africa and South America.

In many cases, you know who you are and have already embarked on your chosen path to leadership. In others, you're still too busy formulating your own suc-

We all have the opportunity to lead by example and inspire others simply by doing a good job.

cess to think beyond what you do or jump into something bigger. To all of you, let me offer some advice.

Certainly, part of being a strong leader is being realistic about what can be achieved – especially in the short run, where change often happens slowly or seemingly not at all. It's also important not to confuse prudence with defense of the status quo: People will tell you that those two things are related, but prudence is about following the wise course, while defending the status quo means not moving at all. Finally, follow your own counsel and do not let those who are stuck in the past dampen your enthusiasm for change or persuade you that the risks involved in trying new approaches is too great.

The world around us is constantly changing, and companies and organizations large and small, local or national, need to keep pace. This is why I have always believed that true leadership is never limited to those who sit in the president's or chairperson's or CEO's chair. Rather, we all have the opportunity to lead by example and inspire others simply by doing a good job. On that level, industry leaders can come from all walks of life and all levels of endeavor so long as they have passion and a vision.

I'm not so naïve that I think everyone in the industry is cut out to be a leader. Many simply are not ready, nor will they ever be. But if you have good ideas, an engaging personality and lots of determination, *now* would be a great time to stand up and be heard. Who knows? You might just be the one who leads us into a brighter future – and you'll never know unless you try! WS

On the Level

Water's Flip Side

By Bruce Zaretsky

While we in the watershaping world are justified in revering water, we also need to be conscious of its property-damaging potential as we proclaim its multiple benefits.

For a dozen years, this magazine has celebrated the beauty, majesty and positive potential of water in the landscape. We've seen it flowing down waterfalls, over vanishing edges, across slopes and through the air. We've seen what happens to colors immersed in it, how it creates shimmering light patterns, how it works its way over stone and, perhaps most important, the joy it can bring.

Its potential to entertain and sustain us is indeed vast, but for all of its glories, water can also be inglorious as well – as when rivers overflow their banks, rainfall collapses roofs or tsunamis inundate coastlines. So while we in the watershaping world are justified in revering water, we also need to be conscious of its property-damaging potential as we proclaim its multiple benefits.

The simple fact is that water can be destructive, which means we always must do all we can to stem its capacity to do harm and mitigate the risks that come along with it. This is why we grade the land to keep surface water from running into basements or pools or play areas. This is why we drain the backs of retaining walls and do all we can to avoid the consequences of hydrostatic pressure and freeze/thaw heaving.

This is why, in sum, we need to think about water even when watershapes aren't part of a project we're designing or building.

avoiding trouble

I, for one, constantly think about water in designing my projects, whether it has to do with a grading plan, a water-capturing system or a decorative waterfeature. To work any other way, I believe, is to court disaster. All too often, however, I see projects where basic hydrological concerns have been ignored.

Just this past summer, in fact, I worked on three consecutive projects (two of which I'll discuss here) where we needed to assess a water problem, figure out a means of resolving it, repair the damage it had caused and then build what had been removed all over again. In all cases, these situations were entirely avoidable. In one instance, just six bucks' worth of aluminum flashing would have saved a homeowner the considerable cost of repairing a set of steps as well as part of the house.

In that particular case, I received a phone call from the neighbor of a former client: She'd had a patio and steps installed by another contractor and sought me out because water was finding its way into her basement – the cause of some consternation, obviously enough – and thought I might be able to help.

When I arrived on site, even a cursory look showed me what had gone wrong: Up to about five feet out from the foundation, the new patio had settled and was now pitched back towards the house.

It turned out that this flatwork had been done immediately after the house was built – a situation that calls for unusual care because of the unsettled nature of the soil next to the new foundations. (This is especially true in the Northeast, where the overdig from foundation-building commonly runs three to five feet out from the foundation and reaches to the bottom of the foundation – in this case, eight feet. Allowing for settlement of approximately 20 percent, one would expect this area, left on its own, could settle a whopping 18 inches!)

In my business, I will tell any prospective client that won't work around a newly built home unless I have backfilled the



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area myself (tamping in lifts) or have placed water-soaker hoses on the area and let them run about an hour a day for three weeks. The second option is not generally recommended unless the client is certain the exterior of the wall has been adequately waterproofed (not too often the case); as an alternative, we often wait until the house has gone through a good freeze/thaw cycle before sizing up the situation.

In this instance, however, the other company had come in right away and built a set of segmental-wall stone steps with concrete-paver inlays alongside a patio made with the same pavers – and it settled. Making things worse, the installer told the client they didn't guarantee any work within five feet of the house and refused to come and redo the work at no charge.

Obviously, the contractor knew the patio was likely to settle. So why not take care of it up front? Why lose a perfectly good client over an issue that could easily have been avoided?

solid bases

So we came on the scene and were asked to fix things – a simple (if time-consuming) project. What we found when we removed the steps, however, made us wonder even more about what the original builder had been thinking.

When we build step systems of this type, we use the same block to build the fill, essentially creating a monolithic stoop out of segmental concrete wall units. Not everyone does things that way, basically because it increases costs for the client,

The damage to this deck was caused by improper installation of rain gutters on the roof above that made water flow down *behind* the house's siding. When that water reached deck level, it became trapped behind the deck's ledger board, exposing the rim joist, sill plate and joists beneath the breakfast nook to repeated wetting and drying. Eventually, the rim joist/floor joist interface failed and the room's floor dropped by about half an inch. All of this could have been avoided with a proper setting of the gutter under the roof line.

so lots of times we'll find perimeter walls made with concrete units and interior cavities filled with stone. If the fill material is of the right type, drains adequately and has been compacted thoroughly, it's a perfectly viable system.

In this particular case, however, there was a problem where the stone interfaced with the building. The doors above the steps were typical bypass sliders, below which there was a trim piece that sat atop the house's plywood sheathing. The trim piece here was cedar, which needs periodic sealing to protect it from the elements.

The installers had piled stone (in this case crusher run) as the base material, right up to the level of the door's trim with no additional waterproofing. Even if all they had done was to attach a simple piece of aluminum flashing to the cedar – tucking it up under the threshold and hanging it down below the cedar trim to create a drip edge – all would have been well.

So we removed the trim, installed the flashing, applied silicone sealant to the nail heads, rebuilt the steps and added a piece of manufactured-wood trim from Azek Building Products (Scranton, Pa.) that requires no paint and is not affected by water.

When you boil it all down, this horror story teaches two lessons, not just one: First, you need to take care when working around newly built structures to make certain the soil will adequately support your work; and second, that you should always, *always* make certain your work is as waterproof as it needs to be.

Knowing that water can be a vicious invader, I want to keep it where it belongs. This is doubtless why my crews call me the King of Silicone: I want every hole, every nail, every seam to be protected.

shameless

In the second of the projects under discussion here, we were called in to redevelop the landscape for an upscale 20-year-old home. I say "upscale" not because of the caliber of the original work, but rather because in 1990 the home was built and put on the market at $400,000, which was a whole lot of money at the time for homes in the part of New York where I work.

In fact, the developer was about as bad as bad gets – both incompetent and dishonest and for many years on the wrong end of a long stream of lawsuits because of the work he'd done or failed to do. We arrived knowing something of this background and wanting to do something wonderful for the clients as a sort of cosmic reparation for all they'd endured.

One of the things we wanted to do was update the look of the roofed brick porch, which had not fared well through the years. For one thing, many of the bullnose-edge bricks had fractured as a result of water infiltration. They had a high

coefficient of absorption, would suck up water in the fall and then would freeze and fracture over the winter.

We decided to insert a Bluestone border around sections of brick that were not as exposed to the weather and were therefore still in fine shape. To remove the perimeter brick and install the bluestone, of course, we needed to remove the lower wraps on the posts holding up the porch.

When I removed the first piece of trim, I noticed that it was newer than the rest of the post wrappings. I didn't think anything of this at the moment beyond guessing water had wicked up behind the original trim piece and had rotted it away, requiring its removal and replacement in this instance with a manufactured, non-wood trim.

I still assumed at this point that an interior, core post was actually there to support the flat, Georgian-style roof with its Yankee gutters. Imagine my surprise (and horror) when we started removing the other wraps and found the core posts were gone, probably the victims of carpenter ants that flowed out of the cavities.

Water is a wonderful design medium, but experience shows me that water also participates in my projects as a potential menace, which is why I consider how I can assure my clients that five, ten and even 15 years down the road I will not be leaving them with any problems.

Upon further investigation, we found that none of the four supports had cores and that the flat roof was being supported by nothing more than the rotting, ant-eaten remnants of the three-quarter-inch pine trim. And winter was coming, which would mean a snow load and the near-certain collapse of the roof structure.

to the rescue

This whole situation made my brain hurt for a number of reasons: First, when the carpenters built the house 20 years ago, didn't any of them stop to think, "Won't these unpainted pine boards suck water up when it rains? And won't this make them rot?" Second, did the house's plans actually specify this detail without a center support column in steel or wood? Third, where was the building inspector when this was happening? And fourth, didn't the builder or the foreman notice

the absurdity of this detail?

(The builder gets no break from me: Three years ago, we replaced a deck across the street from this home. In removing it, we discovered that not only was the rim joist completely rotten, but that water was running off the roof and down the *back* of the siding – meaning the supports for the joists inside the house in this area had become rotten as well. [See the photographs on page 18.] The upshot was that the breakfast nook above the damaged area had dropped about half an inch. We repaired the interior joists and the rim joist before proceeding with the deck work we'd originally been asked to do.)

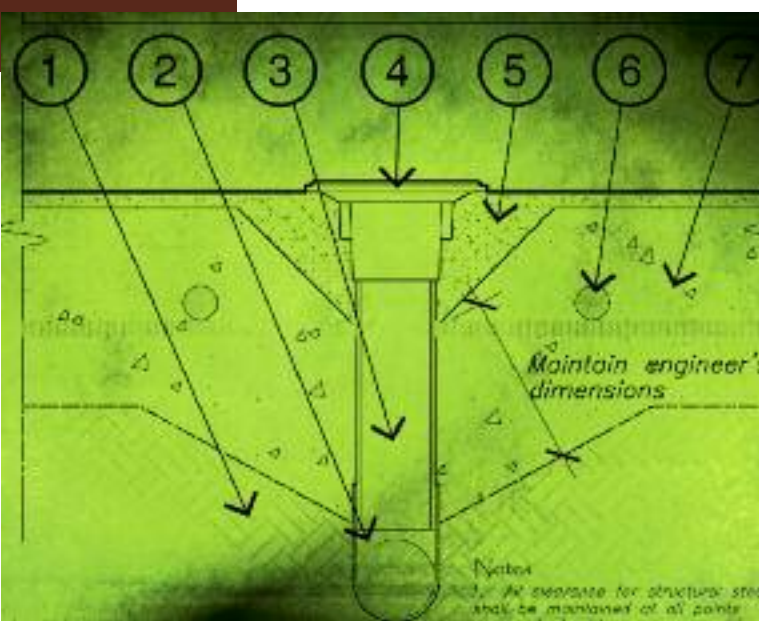
In approaching the support issue, the first thing I did was to set up some temporary columns to hold up the roof, then I called an exterminator. We completely removed all four columns, cut away any rot and slid pressure-treated six-by-six timbers inside the trim. We had waterproofed the bottom ends of the pressure-treated columns and stood them in place using steel ties to attach them to the concrete subporch. Then we set our bluestone treads around the posts and over the steel ties.

The important detail here is that we did not allow the surviving pine wraps to come in contact with the stone. Where the pine had rotted, we replaced it with cedar that ended about an inch above the Bluestone. Then we used the manufactured-wood wraps to come in contact with the stone, adding a manufactured-wood quarter-round trim to complete the detail.

As I mentioned at the outset, water is a wonderful design medium, which is why just about every project I do involves decorative water in some form. But experience shows me that water also participates in my projects as a potential menace, which is why I look at everything I do and consider how I can assure my clients that five, ten and even 15 years down the road I will not be leaving them with any problems that might reasonably be anticipated.

The thing that gets me about so many of these issues is that getting things right the first time through is simple and generally inexpensive – particularly when the alternative is the failure of the project and costly repairs! WS

Currents



Seeking Perfection

By Mark Holden

Through the past two years, a handful of voices in this magazine and elsewhere have called for building pools without drains as a means of virtually eliminating suction-entrapment incidents. The response to this suggestion has been strong, both for and against.

In sifting through some of these discussions – including a key interview with Dr. William N. Rowley that appeared online last fall on the *WaterShapes* Web site – one item caught my eye: It came from a watershaper who clearly didn't have a horse in the race but simply wanted to know how to go about building an efficient pool without a suction outlet at the deepest point of the floor.

Good question, I thought, which prompted me in taking my turn at writing "Currents" this time to offer a drainless design that meets the needs for proper circulation while making pools and spas as safe as possible.

timely idea

For my own part here, I don't mean to be argumentative. Instead, I'm just offering suggestions based on my long experience with the issue, and I do so because I sympathize with those watershapers who are less interested in debating and would rather focus on finding and implementing a reliable solution to the problem.

I am one who feels an obligation to lead by example. As a result, I have started designing and building in such a way that the risks to bathers are demonstrably and dramatically reduced.

In conducting countless safety inspections, I have personally seen that every single entrapment-protection system ever devised can be (and quite frequently has been) damaged, disengaged, altered or removed by a service technician, a pool operator or a homeowner. Likewise, drain grates seem to become old or cracked or lose their screws and for whatever reason seem to be subject to frequent removal. For their parts and despite the good intentions of designers, specifiers and builders, pumps are too frequently sized improperly.

And all of this – *all* of it – is aggravated by the fact that the pool/spa industry has an amazing capacity to resist change, no matter how crucial the issue might be to its ongoing prosperity. Then there's the fact that the design community (meaning landscape architects and architects) have the ignoble habit of ignoring water-related specifications. Topping things off, there's also the fact that, in residential situations, even the regulators themselves have a pronounced tendency to ignore codes and seemingly make things up as they go along.

Making real change in this context is, I think, all about coming up with a model – an example toward which we should all be striving – and then tailoring the regulations to fit that ideal.

I am enough of a realist to know this will not happen overnight, but I am also one who feels an obligation to lead by example. As a result, I have started designing and building in such a way that the risks to bathers are demonstrably and dramatically reduced – to such an extent, in fact, that these watershapes go well beyond what any health department has ever required to date. And I apply the same principles in residential pools as I do in commercial and institutional projects.

Here's hoping that this approach, which I'll describe here, helps some of you handle these issues in safe, sensible ways.

My aim here is to fuse the most advantageous products and techniques available into a comprehensive program that never lets the viability of any single object or measure within the sys-

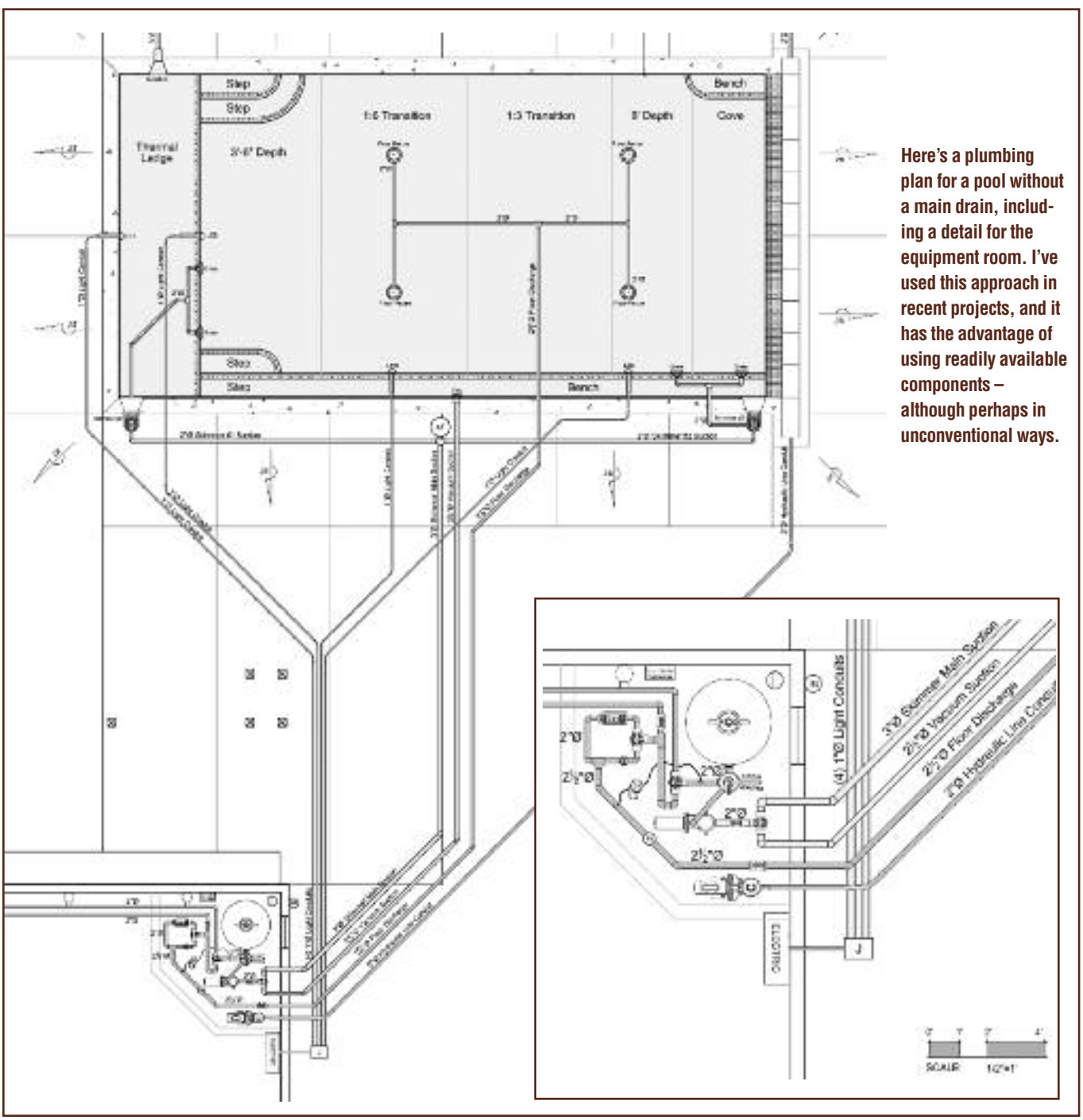
tem determine whether a pool or spa is safe. As I see it, my approach is analogous to the use of seat belts: On their own, they do not make driving entirely safe, but when used in combination with airbags, crumple zones and good driving habits, they can work *wonders*.

This is why, as many others have suggested, I start by eliminating the drains themselves: They are beyond doubt the most dangerous of all the pool/spa components involved in entrapment incidents – and there's no need for them to be there at all!

walking the line

Indeed, the only argument in favor of continuing the use of drains is that they are needed to ensure proper water circulation. Although some argue strenuously that this is simply not true, let's assume for the sake of this discussion that it is. I, for one, recognize that if you leave the water in the bottom of a pool stratified and basically uncirculated, you're inviting all sorts of problems with bacteria and algae – not to mention a distressing appearance.

In that light, it seems the key in removing the drain is to make certain we



Here's a plumbing plan for a pool without a main drain, including a detail for the equipment room. I've used this approach in recent projects, and it has the advantage of using readily available components – although perhaps in unconventional ways.

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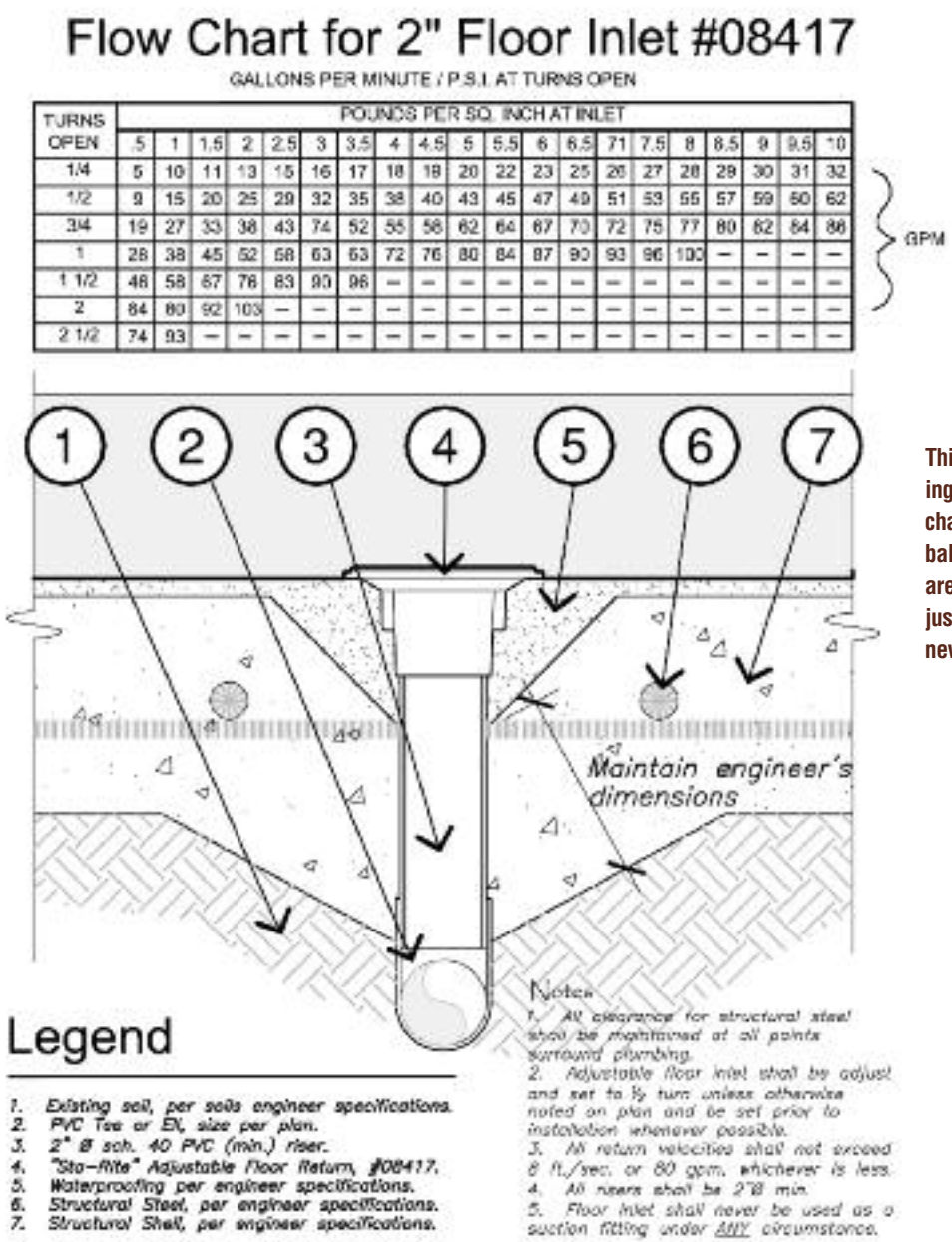
alter the way we circulate water in a pool. The obvious thought here is to return water through the pool's floor – a common approach in competition and public pools that should be used in *all* residential pools. Not only does this positioning of inlets improve circulation, but it also improves heating efficiency and ensures better distribution of sanitizing agents.

If drains are deleted from our watershapes, skimmers will by default become the primary suction devices for all pools and spas. There's a problem here, of course, because most builders run too much water through them and don't do a good job of handling equalization. Happily, there are easy solutions on both fronts.

Most skimmers are rated by the Nation-al Sanitation Foundation (NSF) for a maximum flow of 55 to 75 gallons per minute, so I would suggest that the code writers need to develop a firm rule that all watershapes designed for human immersion should have a *minimum* of two skimmers. That would be the rule for pools with capacities up to 30,000 gallons (with maximum six-hour turnovers), after which another skimmer should be required for each additional 18,000 gallons.

As for the equalizer lines that are activated when low-water conditions ren-



This chart shows the effects of tuning floor returns to provide the flow characteristics needed to maintain balanced circulation. Again, these aren't unfamiliar components: It's just that we need to look at them in new ways in a drainless context.

The whole principal of this new breed of watershape has to do with designing and building the best pool possible rather than the easiest or cheapest.

der skimmers inoperative, they all need to be split and set up in walls with grates a minimum of 48 inches apart. In addition, they should be rated with minimum 100-gallon-per-minute flow capacities at each grate. That way, in normal low-water situations, there will be a theoretical maximum of 25 gallons per minute running through each grate when it is not covered in an entrapment situation.

Floor returns (also NSF-rated) must be at least four in number for the first 400 square feet of surface area, with another return added for each additional 100 square feet of surface area. These units should be rated with minimum flows of 25 gallons per minute. And I would suggest that simple flush-cut pipes should not be used, as toes might be ensnared by them.

different thinking

This fresh approach in no way relieves the designer or installer of the responsibility of observing sound hydraulic practices. For a variety of reasons, I believe velocities should be lowered in all watershapes meant for human immersion. In fact, I would set the upper limit at suction points (that is, at the skimmer and equalizer lines) at a maximum of five feet per second and at discharge lines of no more than seven feet per second. Not only will these levels minimize any opportunities for hair or limb entrapment, but they will also substantially improve equipment efficiency.

In this context, the use of variable-frequency-drive pumps is much to be desired. Many of them now include integrated SVRS devices, thereby further limiting entrapment hazards while also minimizing energy consumption. Frankly, the use of these pumps simply makes sense in a marketplace in which hydraulic systems are rarely designed with accurate assessments of horsepower needs in hand. Once these new pumps are set and locked, both safety and energy efficiency are improved.

The accompanying illustrations offer an overview of how such a system might look (see page 24). As has always been the case, there are numerous possible ways to achieve similar results. The idea here is to focus on the desired outcomes and then back up to define the systems needed to support those outcomes without hesitation or compromise.

Have no doubt that these systems are real: I've been using these concepts myself in recent projects; all of the components are readily available; and I have never been surprised by the fact that this new angle on what I do is producing watershapes that are more efficient as well as safer.

The whole principal of this new breed of watershape – this thing I call "The Perfect Beast" – has to do with designing and building the best pool possible rather than the easiest or cheapest. As I see it in these difficult times, improving and indeed completely altering the reputation of our industry to everyone's benefit calls upon all of us to rise above minimums and start striving toward maximums.

If I had my way, every single residential pool and spa built henceforth would represent the pursuit of the ideal and compliance with a stringent new set of rules that leaves none of us with more than a few shreds of wiggle room. I know the very thought of more regulation offends the sensibilities of a great many watershapers, but my assertion is that doing things in accordance with this new model makes the process simpler to follow and dramatically increases the safety of our products.

Swimming back to my automotive analogy, driving in traffic at high speeds without the protection afforded by seat belts, air bags, crumple zones, antilock brakes and any other available car-safety feature now seems unwise. Driving a short way over to pools and spas, it seems similarly unwise to swim in a pool or lounge in a spa that lacks *any* of the safety features I've mentioned.

forging ahead

It's true that people don't like change, but what does that matter if our clients can be safer when they bathe or swim? What's so appealing about angry threats, regulations and lawsuits that make people cling to the past? It may be true that there's easier money to be made by working in familiar ways, but experience tells me there's even more to be made by doing things differently and facing the fact that substandard work will chase you well beyond the day you finally leave (or are driven from) the business.

I've said many times in this space that it's time to move forward, and I've asked those who disagree with me to register their reactions by writing letters to the editor. As yet, nobody has told me why this approach to safer watershaping should not be law. Now that I've spelled out my position on this concept of a drainless pool in even greater detail, I'd be happy to engage in a discussion of the merits or deficits of what I propose and keep this dialogue going.

I am convinced, based on conversations I've had as well as work I've examined, that lots of you out there agree with me. As I see it, those of us who've adopted these approaches and techniques, even if only in part, also have an obligation to stand up and be counted, just as surely as those who disagree with me need to stand up and defend their positions.

And if there is no opposition and everyone agrees with me, why is anyone still talking and why isn't everyone eliminating drains from their designs?

These days, I don't think we have the luxury to stand still and wait for things to unfold around us: The future of what we do is literally at stake, and if we want to prove ourselves worthy of the role we'd like to have in bringing physical fitness, physical well-being and joy to those who own and use our products, I can't think of a better time to settle this discussion. WS

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Using Decorative Concrete in Swimming Pools & Water Features

By Paolo Benedetti. Friday 10:00am–11:50am
This course will explore decorate concrete decking, poured in place water features & pool coping, incorporating architectural details, concealing drains & utility access, water proofing techniques, controlling efflorescence, decking to pool interfaces (isolation joints) and meeting client expectations.

Fireplaces and Fire Features from Design to Completion

By Scott Cohen, Tuesday 1:00pm–2:50pm
In this highly visual seminar you will learn about key design considerations such as scale, placement and patio size, and explore the lingo involved in fireplace construction. Additionally, this course will touch on the different elements that make up outdoor fire features as well as basic construction tips.

Cashing in on Rainwater: Pervious Concrete

By Scott Erickson, Wednesday 10:00am–11:50am
Pervious concrete allows stormwater to flow directly through the pavement, providing passive filtration and detention, and groundwater recharge. Learn how pervious mix designs work so you can select the best mix for your product, and apply decorative techniques to create and sell architectural pervious concrete, by improving its appearance without sacrificing performance.

Decorative Effects with Stenciled Concrete

By Todd Rose
Wednesday 8:00am-9:50am/Thursday 8:00am–9:50am
This hands-on workshop will show students how to stencil concrete with multiple textures, borders, bands and finishes. It will cover exposed aggregate and the use of admixtures.

Concrete at Home: Anatomy of Designing and Building a Modern Concrete Home

By Fu-Tung Cheng, Thursday 10:00am–11:50am
This seminar is a visual presentation of the design and architectural process of Cheng Design. The emphasis will be on creative touch-points and the critical paths to creativity with a focus on concrete, from the smallest design details like concrete countertops and fireplace surrounds to the big picture structural requirements.

Understanding Sealers

By Scott Thome, Wednesday 3:00pm–4:50pm
This seminar will provide a comprehensive introduction to sealers for concrete. Attendees will learn about the different types of sealers, how sealers work, which type of sealer to use in specific applications, VOC issues and more.

A Comprehensive Guide to Staining Materials and Methods

By Shellie Rigsby & Randall Klassen, Friday 8:00am–9:50am
The course covers methods and materials used by advanced stain artisans for commercial and residential projects. The overview includes new developments and tried-and-true methods and materials, including acid stains, water-based stains, dyes, metallics and other coloration materials.

Panel Discussion: Decorative Concrete and the Universal Solvent

Panelists–Scott Cohen, Paolo Benedetti, William Drakeley
Thursday 3:00pm–4:30pm
This panel of industry experts will discuss various applications of decorative concrete for use with still or moving water. Conversation topics include durability, waterproofing, Glass Fiber Reinforced Concrete versus steel-reinforced concrete, and aesthetic possibilities. Moderated by Eric Herman and Jim McCloskey.

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A GREEN HARVEST

In an effort to broaden interest in use of sensible water-management systems, Aquascape's Ed Beaulieu set out early in 2009 to persuade his hometown to submit to a thorough 'green makeover.' Working with homeowners and city officials, he brought in a flock of pond/stream professionals to install – in just one day – a host of rainwater-capturing systems, ponds and streams. In the process, they created what suddenly became a more sustainable community.

BY ED BEAULIEU

Oddly enough, this story takes place in a down economy and shows how, despite perceived financial limitations, something surprising and wonderful can happen when people put their minds to it.

For years now, my work at Aquascape (St. Charles, Ill.) has largely focused on developing, designing and installing systems that in one or more ways are environmentally sound and beneficial. In early 2009, I began working on a plan for a prototype community designed around optimal use of its resources, especially water.

I imagined a town filled with rainwater-capturing systems, permeable surfaces and efficient irrigation. It included nothing but indigenous plants, was organized with minimal turf areas and set aside space for composting and cooperative organic farming. As for the homes, all of them boasted various resource- and energy-efficient features.

The overall concept was so bold and appealing that my wife and I had serious conversations about moving there if this place were ever to be built or if we ever found a community like it anywhere else. But here's where the economy stepped in: Housing development was (and still is) so flat that the concept never moved off the drawing boards.

We didn't let that stop us: Before long, we started talking about bringing elements of our ideal community right into our hometown of Sugar Grove, Ill. Just maybe, we thought, we could inspire our neighbors and civic leaders to undergo a sort of mass-scale green makeover? We had no idea where this kernel of an idea might lead us, but recent experience indicates that this might be the start of something *big*.

OPENING IN BLISS

We began by inviting neighbors in our subdivision over to our house for a meeting. It was a Sunday afternoon in June 2009, and we were pleased that, of the 130 homes in our Lakes of Bliss Woods development, 40 were represented at the meeting.

I briefly presented our ideas, explained that making them happen would involve area homeowners, businesses and community departments in installing a variety of rainwater-collection systems, permeable hardscapes and other water- and resource-management strategies – and declared our goal as being to take us a long way toward becoming a so-called "sustainable community."

We've lived in Sugar Grove for years and have always been active in the community through kids' sports and other programs. Lots of people around here know I'm with Aquascape, and we've been so public about what we've been thinking that many of our neighbors came to the meeting with some idea of what I'd be proposing.

But this was about much more than selling ponds and streams: I approached the meeting from a completely different angle and talked about how, in today's world, we're all bombarded with information about "going green" – and how even people who want to do their part have a hard time figuring out what to do on an individual basis that will make any difference.

Using systems and products we've been developing and using at Aquascape

as a framework for what could be done immediately, we covered a number of possible scenarios:

- If you're interested in wildlife, we could install an ecosystem-style pond or a rain garden.
- If you're interested in the sights and sounds of moving water and like the idea of offsetting water usage, we could put in any of a number of variations on basic rainwater-capturing systems, from elaborate pond/stream systems that include rainwater storage cells to small waterfeatures or simple barrels that collect, store and allow for efficient recycling of rainwater.
- If your primary concern is managing rainwater runoff, we could install permeable hardscape areas and use them to feed rainwater reservoirs.

The list went on, and my basic thought was that by presenting a number of options that required degrees of involvement that ranged from slight to intensive, we had a chance of appealing to the widest possible range of participants while respecting their budgets and priorities. My desire was to demonstrate how we could collectively put a stake in the ground for the cause of resource management – and show how a small residential/farm community of no more than 9,000 people could make a real difference.


A


B

HANDS UP, HANDS ON

It might seem surprising that all of this took place in the Chicago area – a place where we're on the receiving end of a robust average rainfall of 40 inches each year. Given that abundance, it wouldn't seem that capturing water would be as crucial as it might be in a more arid place. Indeed, we went into the meeting thinking that we'd have a hard time persuading people that wise water use was important everywhere, even where it is plentiful.

What we quickly learned is that ample water can be too much of a good thing: What we ran into was an amazingly strong desire on the part of our neighbors to manage the runoff from all of that rain, with some people expressing concerns about their yards' tendencies to flood and others rallying to make points about overflowing storm drains and the perils of flooded streets.

We even discussed the runoff issue on the macro scale, getting into a discussion of the value of reducing our runoff because it eventually flowed into the Mississippi River system. True, water from our area travels through multiple streams and rivers on its way to the mighty Mississippi, with 1,200 miles to go before it reaches the Gulf of Mexico. But all runoff eventually does flow to the sea and does have an impact on the health of our coastal ecosystems.

As someone with a background in aquatic biochemistry and oceanic studies, I get particularly passionate about runoff issues and know it's the number one cause of pollution in the world's rivers, lakes and oceans. I see managing what we put into our rivers on a small scale as an essential building block in broader efforts to maintain thriving ecosystems – and I was both pleased and surprised to watch my neighbors jump on the bandwagon.

As first meetings go, this one was almost too good to be true. Once my presentation was done, I was thrilled by the flow of thoughtful questions focused on what we could do and how we might do it. I saw none of the cynicism that commonly attends discussions of environmental issues; instead, it was clear that a large number of these people had already gone past curiosity and were seriously contemplating ways to get involved in a community-wide program.

Of course, discussion is one thing, action another – and I had no idea how many people would actually sign up. Those were (and still are) economically challenging times, and we were not offering any of our systems *pro bono* or even at a discount.

My thought coming out of the meeting was that we'd be fortunate if a dozen or so homeowners participated – about 10 percent of the neighborhood. Within just a few days, however, a total of 30 homeowners came forward with a go-ahead. To say I was proud and happy would be a gross understatement.

Organizing a Stampede

As might be expected, there was quite a range of projects within that

Some of the projects we executed were modest in scale, as with the insertion of a rain-collecting barrel in one instance (A) and the installation of a bowl fountain next to a new, permeable deck (B) in another. In all cases, however, the impact was significant – as in the yard in which we replaced a large, solid-concrete deck (C) with a new one made with permeable pavers (D).

In a couple of cases, we turned open surfaces of lawn into decorative features that do a much better job of dealing with runoff (A & B). In one special case, however, we became involved in something of a renovation project by taking an existing pond (C) and sprucing it up with a more naturalistic appearance (D). Here and elsewhere, these photographs were taken immediately after installation – well before the plants had an opportunity to become established.

clutch of 30, from elaborate pond/stream compositions with planted wetlands consuming large portions of given properties to simple pondless waterfeatures or rain barrels. There were also a few who focused entirely on managing runoff and had no greater interest than in trying out the permeable-deck concept.

As things started coming together, we contacted the mayor and city council to let them know what was happening and immediately received an unqualified endorsement. In fact, the city stepped up to the plate and authorized an elaborate system for the grounds of the public library and requested a rain-barrel system for police headquarters.

(Longer term, we're also working with the city's fire department – a particularly exciting endeavor because fire fighters consume tremendous volumes of potable water in testing and cleaning equipment and in running training exercises. With so much rainfall coupled with a substantial rainwater-collection program, they'll soon be able to use stormwater for incidental purposes and dramatically reduce their use of potable water.)

In putting all of this in motion, we at Aquascape decided to adopt Sugar Grove for our annual "Pondemonium" event – meaning we could corral the energies of approximately 400 of our dealers, installers and distributors and descend on the community to get everything done in one eight-hour frenzy of activity.

Yes, it's true: We meant to install all of the systems in a single day in August 2009. With that implausible goal in mind, we set to work right away, designing each installation and doing site-preparation work in anticipation of the big day.

Of course, this left us to convince our 30 clients to go along with our ambitious plan – and once again I was amazed at the level of cooperation and enthusiasm: Almost to a person, these clients viewed their participation as being part of something no one else had ever done, anywhere (so far as we know).

And for anyone who might think this had devolved into nothing more than a commercial stunt, please be advised that, straight up, we worked with every client on an individual basis in planning systems in painstaking detail. We knew that installing everything in such a whirlwind was just one of the challenges we faced: We also had to be *very* certain that these systems were all designed appropriately and could be installed correctly while yielding attractive results.

One thing that helped us tremendously was the fact that the rainwater-capturing systems all had the same basic infrastructure, with the only differences being matters of scale. In fact, individual systems were unique only by way of the decorative elements we placed on top of each reservoir – a detail we discussed thoroughly and planned carefully with each homeowner.

We also covered the full range of practical issues, defining property access, for example, and deciding where materials would be placed before installation began. Uppermost in mind, we knew we wanted to avoid any unpleasant surprises for our clients (who are, after all, my neighbors).

Pride and Joy

Suffice it to say, from the beginning I felt that there was a lot riding on the success of the program.

In the weeks leading up to installation day, we went to work

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all over the neighborhood, excavating sites, laying down liners, assembling reservoirs and moving in countless tons of equipment and materials. Essentially, we wanted to have everything staged so that, once the installers arrived, we could immediately set them loose to place aesthetic elements, rocks and plants and turn on the water.

With so many crews on hand, we felt that proper preparation, planning and organization was essential to getting everything done. Try as we might to keep things cool, however, the entire neighborhood was sucked into a whirlwind for a stretch of about six weeks, with the streets and properties jammed by people, materials, equipment and, of course, noise and brief traffic delays.

Frankly, the whole thing had me worrying. After all, while we had 30 participating residences, there were another 80 homeowners who weren't part of the program but were nonetheless going to be inconvenienced. And again, as a resident myself, I was more than a little concerned that large doses of anxiety and frustration would be directed at me – perhaps rightfully so!

Yet again, however, the reaction from the community knocked me off my feet. At every turn, we experienced good-natured cooperation, accommodation and patience. Even those not participating in the program came out of their homes and expressed support and offered to help however they could. They, too, came to be part of something special.

When installation day finally arrived, it was something to behold: A massive, organized stampede of enthusiastic and capable pond/stream specialists frenetically crawling over the neighborhood, spreading gravel, installing plants and placing rocks – everyone helping each other, interacting

Our decision to link the Sugar Grove project to our company's annual Pondemonium event meant we had a substantial workforce on hand to get all sorts of tasks done in a hurry. It was a great opportunity for new installers to participate and learn the ropes from experienced professionals.

warmly with residents and treating the event like a massive and exhausting celebration of aquatic potential.

As the dust settled late that day, we noted with pride that every single system was installed, filled and operating: The whole, manic affair had come off with nary a hitch.

To nobody's surprise, of course, in the days and weeks following the installation we revisited a number of the installations to make mostly minor adjustment that mainly had to do with enhancing appearances. That follow-up effort, however, was *far* less involved or extensive than I thought it might be.

Mostly what I encountered following the event was unqualified praise. And as deeply as I know that all of the professionals involved did an amazing job from start to finish and deserve tremendous credit, I also know that the main reason the program came off so well is largely attributable to the support we received from the community.

From the outset, the community's energy and acceptance defined the process. By force of will, it seems, homeowners and city officials made this project a success – so much so that some

Not all of these projects were done on grand scales, but most were done with significant focus on stormwater and runoff control. As shown here in before-and-after images, for example, a couple of the participating homeowners wanted modest waterfeatures for their homes' entry spaces – beneath which we installed large rainwater-collection and recycling basins.

of the 30 homes have since been included in garden tours, other homeowners have signed up for systems of their own and the mayor has asked me to prepare a follow-up presentation on the project for the city council.

AFTERGLOW

The big lesson here is this: When you present interested people with tangible solutions to resource-management issues and are able to define attainable, understandable ways they can be part

of a grand set of solutions to environmental challenges, many have the desire and capacity to join in without reservation.

It bears mentioning, however, that our success in Sugar Grove has not yet translated into similar campaigns elsewhere. We hope, of course, that members of the Aquascape family who came to town for installation day will take the experience back to their own communities and do what they can to implement similar programs there, to whatever extent possible. Some have indeed made progress along those lines, but none so far on the scale we witnessed here.

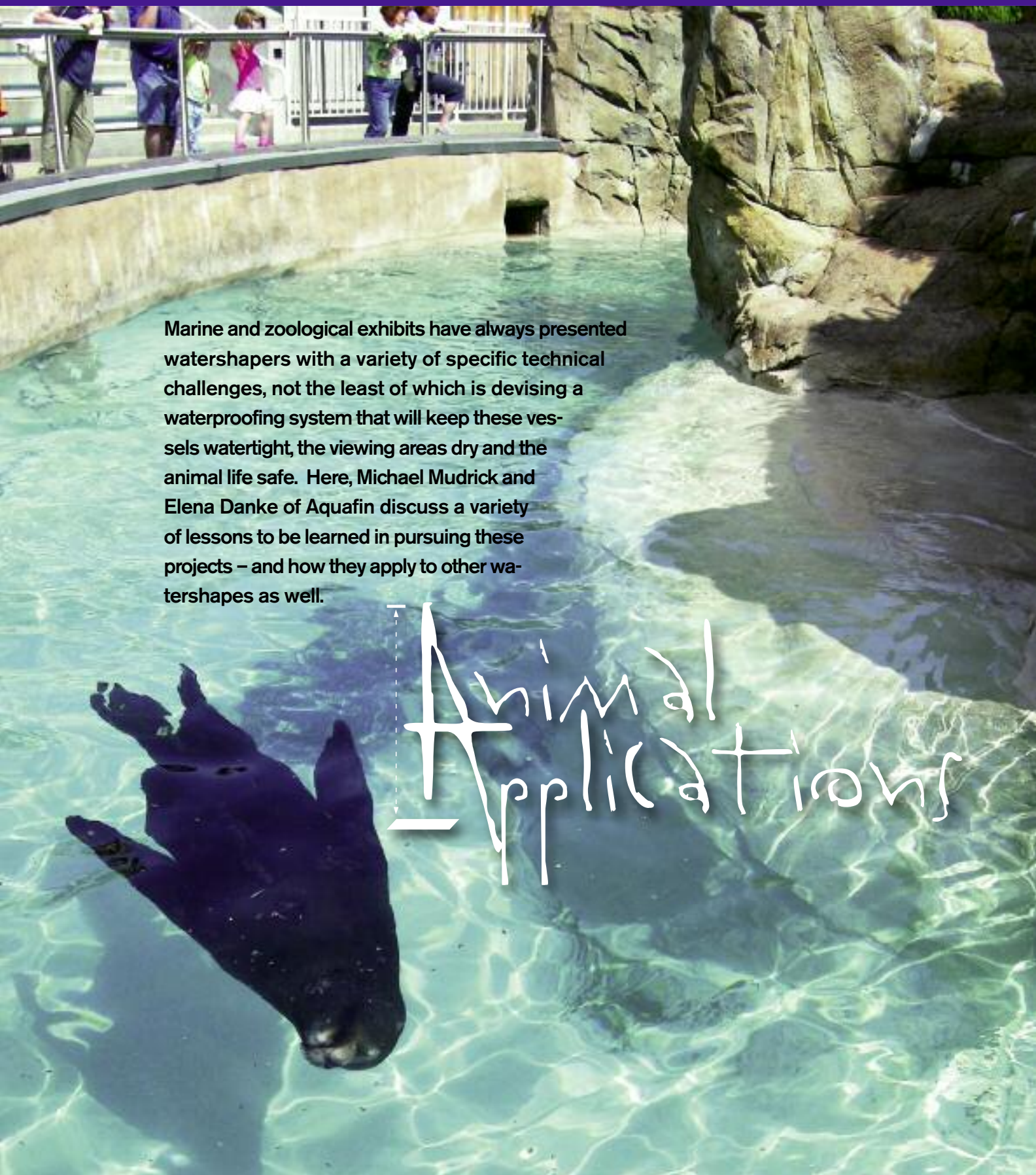
My sense is that much of the immediate resistance to these programs is rooted in the economy and a general reluctance people have to spend on anything other than basic necessities these days. But the dreamer and the scientist in me both like to imagine a day when this type of community effort will be commonplace.

What keeps me going is the rough calculations I've done on water use and runoff involved in the Sugar Grove program: The numbers get significant in a *hurry*.

A few of the program's participants gave us clean slates and large spaces to cover with more ambitions installations. As these before-and-after images show, we were able to turn relatively flat, featureless expanses of lawn into pond and stream systems that will operate using rainwater and will only look better and better as the plantings take hold.

It's evident to me that, with this type of grassroots approach, the watershaping industry (and our clients) can become part of a movement that will – in measurable, verifiable ways – have positive effects on individuals, communities, priceless natural resources and the environment.

Finally, it's worth mentioning that in the year since we installed all of the Sugar Grove systems, our neighborhood has seen a notable increase in its populations of birds, insects and terrestrial creatures. It seems the human residents around here aren't the only ones who know a good thing when they see it!



Marine and zoological exhibits have always presented watershapers with a variety of specific technical challenges, not the least of which is devising a waterproofing system that will keep these vessels watertight, the viewing areas dry and the animal life safe. Here, Michael Mudrick and Elena Danke of Aquafin discuss a variety of lessons to be learned in pursuing these projects – and how they apply to other watershapes as well.

Animal Applications

Photo by Sarah Johnson

By Michael Mudrick & Elena Danke

Designing, engineering and installing watershapes for zoological and aquarium applications is never a casual exercise, especially when it comes to waterproofing.

Not only do you have to find a product or combination of products that can accommodate various structural penetrations, adhere to all of the materials being used and, quite often, conform to irregularly shaped surfaces: Whatever material or system you select must also accommodate the needs of the creatures that will eventually dwell in these spaces.

As waterproofing specialists and engineers, we've dealt with these projects at Aquafin (Elkton, Md.) for more than 20 years. Among the principal lessons we've learned is that each installation is unique – but that there's much to be taken away from each experience that can be applied elsewhere. We've also learned that it's best when this experience is shared openly so that all watershapers can reap the benefits.

Along the way, we've observed that product selection is more complex than many watershapers recognize and that, as important, proper application is crucial to product performance and longevity. In addition and finally, we're writing this because we see that the waterproofing techniques we've developed through these immense (and immensely complicated) zoological and marine installations have direct implications for other forms of watershaping.

Through our experience, in other words, we've come to see our role as not just that of a material supplier, but also as a consulting member of a larger team with an active role in a project's success. As is so often true, it helps in these situations if we get involved right from the start – reviewing and providing drawings, offering installation training and support and generally working with the architects, contractors, applicators, related suppliers and property owners to ensure that all of the right products are selected and properly installed.

Photos courtesy Cemrock Landscapes, Tuscon, Ariz.

zero tolerance

With large-scale zoological and marine exhibits, we know up front that the majority of leaks and waterproofing failures take place in the areas around viewing panels or windows and at other points the shell has been penetrated.

Where even a newcomer would recognize that sealing the areas around viewing panels and windows would be an issue, we're invariably amazed by the great number of penetrations incorporated into the design of these vessels. It begins, of course, with all of the intakes and outlets for the circulation and filtration systems, but then there are the points where decorative components of the exhibit must be anchored, where viewing panels are installed, where lighting fixtures are placed and more.

These are all penetrations of different sizes and orientations and materials, and waterproofing them successfully can require use of a number of different materials and techniques. As a result, *versatility* is very much the watchword as planning proceeds.

To create zero-tolerance, absolutely watertight penetrations, we generally recommend use of a combination of fluid-applied cementitious products along with gaskets and sealing tapes. The gasket fits tightly around the penetrations and is then embedded in two coats of the waterproofing material to ensure a completely watertight seal.

Next, joint-sealing tapes are placed atop the fluid-applied waterproofing material while it is still wet in all wall/floor or wall/wall corners – an addition that enables us to provide a seal that will be leak-proof even if movement causes the fluid-applied material to crack in the joint. This works because the tapes themselves are specially designed to be both waterproof *and* highly flexible, with up to 600 percent elongation.

(This contrasts with mechanical fastening or anchoring, where if the waterproofing membrane is compromised, leaks will potentially develop. The advantage of a fluid-applied material is that the fastening system is effectively and directly embedded in the wet material and will form a waterproof seal when it cures.)

All of that work with pipes and anchor bolts seems pretty pedestrian, however, when compared with the challenge of working with big viewing panels – typically a crucial inclusion because enabling visitors to experience these exhibits and their inhabitants at close range provides revenues that help to keep these facilities going and thriving. They may offer splendid views of very special worlds, but they also offer opportunities for leakage and even a potential for disaster.

These viewing panels are typically made of acrylic, which isn't necessarily the most compatible of all materials with these exhibits' concrete shells. This raises the bar when it comes to effective waterproofing and makes it an area where we frequently practice what we preach by calling in the experts.

see and be seen

One project in particular where we needed help was at Sea Life Arizona. Located in land-locked Tempe, it opened in May 2010 with the ambition to provide kids with a fun, interactive and educational experience of marine life with an aquarium large enough to house more than 5,000 creatures. The tour opens with a visit to an Arizona park lake, then takes visitors to the shore of the Pacific and on out to the ocean depths.

The main tank holds more than 160,000 gallons of water and includes not only traditional underwater viewing windows, but also features a 360-degree underwater viewing tunnel that allows visitors sublime access to an underwater world.

Generally, the window rebates (that is, the frameworks) for these applications are cast into the concrete shell, but in this particular instance, the plans called for use of stainless steel retaining structures for all of the windows as well as the acrylic tunnel. So rather than the usual challenge of bringing concrete and acrylic together, we had to add stainless steel into our considerations – a novelty that led to our collaboration with an expert.

Bob Gurth, owner of Aquatic Exhibit Group (Wheat Ridge, Colo.), is an Aquafin-certified applicator who, for more than two decades, has designed and built complex aquatic environments. Among his many projects, he has dealt with a number that presented interesting challenges for waterproofing around the

Photos courtesy Edge Concrete, Woodinville, Wash.

viewing panels – and this was another project that proved to be right up his alley.

What he recommended was a schedule in which the concrete tank's walls were waterproofed with Aquafin 2K/M, a cementitious, fluid-applied crack-isolation membrane. This was brought all the way to the edge of the steel in the window rebates. At that point of contact, an epoxy product was used to prime the steel window frames so that the fluid-applied material would adhere properly.

The windows were lifted and set into position, then a special silicone sealant was used to create the final seal between the epoxy and the acrylic. This was an unusual finishing schedule – one we would not have pursued without Gurth's expert guidance.

The general lesson here: Just about anything you need done when it comes to waterproofing a pool or spa or fountain can be done, and it's more than helpful in doing so to be able to call on professionals with the expertise required to get the job done right the first time through.

The variety of shell penetrations in marine and zoological exhibits is quite broad – not just for numerous lights and circulation inlets and outlets, but also quite commonly for viewing windows of various shapes and sizes. As a result, a number of different waterproofing techniques, materials and approaches must be applied, all with great and specific care.

climate counts

The challenges that flow from unusual intersections of materials are one thing; the problems presented by climate and temperature changes are quite another – often dramatically so. Indeed, as every watershaper who works in concrete in any locality where seasons are a factor knows that temperature fluctuations can create substantial amounts of movement in concrete structures.

Take the case of the Denver Zoo and its new Asian Tropics exhibit as an example: When planning this 16-acre complex, the project team ran up against a variety of interesting waterproofing challenges with its large outdoor watershapes.

In August, the average temperature in Denver ranges from daytime highs in the 90s to nighttime lows in the 60s – a healthy but bearable swing. In the winter months, however, the highs might creep into the 40s with lows dropping well below freezing and even down into the teens. It's obvious that these seasonal temperature changes will cause major thermal expansion and shrinkage in the concrete.

And as the concrete shell of the watershape moves, the waterproofing must accommodate this movement; otherwise, cracks will form and leaks are inevitable. For all their versatility, epoxy-based products are generally not up to that sort of challenge. Instead, we've found through experience that cement-based products – when modified using polymer additives – can achieve the significant sorts of elongation capabilities

Photos courtesy Dodson Studios, Warrenton, Va.

that are required in these situations.

Again, it helps if we're involved early on, because we know that curing of the concrete shell is another critical factor in material selection. Epoxies and urethanes, for example, require average curing times for the concrete substrate of 28 days – and a completely dry surface is required. By contrast, breathable cementitious coatings can be installed as few as three days after concrete placement.

(These product distinctions are larger issues in repair and rehabilitation work: We're generally called in to fix problems in wet or damp areas where getting things dry generally happens only *after* the repair products have been installed.)

Taking all of this into consideration, the project team for the Asian Tropics exhibit chose to go with a combination of cementitious products for waterproofing the outdoor watershapes.

We started by adding a liquid crystalline waterproofing admixture to the shotcrete batches when they arrived at the site. By introducing the waterproofing agent directly into the shotcrete mix, we ensured that the entire structure would effectively be waterproof on both the positive and negative sides, thereby protecting the reinforcing steel from corrosion and damage by not only keeping the exhibit's water in the tank, but also by keeping the groundwater from penetrating the outside of the shell.

As an additional layer of protection, we waterproofed the entire inside surface of the shell on the positive side with our highly flexible cementitious fluid-applied membrane. Offering greater than 70 percent elongation, this coating will allow the concrete to "move" in response to thermal shifts both high and low. We also used this product along with joint-sealing tapes and gaskets to secure all penetrations and drains.

material differences

In constructing watershapes in these unusual environments, we typically encounter wide varieties of building materials, from concrete and steel to fiberglass and various other materials.

All of them need to be waterproofed or treated in some manner, and we always explain to product teams and contractors that it is advantageous to reduce the number of different materials they use because it will significantly simplify the waterproofing tasks we need to perform.

Completely Harmless

Unlike most decorative watershapes, large aquariums and zoo exhibits are designed to meet the specific needs of their occupants – creatures that come with specific sets of needs that must be met if they are to survive in captivity.

As a rule, fish and sea life spend all of their time submerged and have little if any direct contact with the coatings applied to keep their environments waterproof, but penguins and elephants and other animals that move from the water to dry land can spend a lot of time in contact with their surroundings.

As a result – and in addition to being resistant to saltwater and/or the chemicals used to balance water chemistry – the coatings and products used in these settings absolutely cannot release any harmful substances back into the water. This means they must be solvent-free, completely non-toxic and certified for safe contact with drinking water.

– M.M. & E.D.

It's fairly common in aquatic zoological exhibits for there to be bulkhead-style viewing windows of a sort familiar to any watershaper who has used a big acrylic panel in a swimming pool project. Extensive waterproofing is required to make certain water doesn't somehow migrate around the panel to mar the aesthetics of the viewing area, but the construction detail itself is fairly straightforward if due care is taken in forming the openings.

Of course, they don't universally cooperate with that recommendation, which is why we've developed versatile, efficient waterproofing agents that will adhere to a range of different materials and surfaces.

This is an important point, because not all materials available in the marketplace have that degree of versatility. So when we get involved, we want to know up front which materials need to be sealed so we can make recommendations about products to be used with confidence that they will work. Sometimes things aren't that simple, of course, but in some cases one product will do – which property owners like because it saves money.

When Chatanooga's Tennessee Zoo added its new penguin facility, for example, cost was definitely a factor, and the designers were trying to cut costs by reducing the volume of concrete to be used in the construction. To make this happen, they decided that *only* the water-holding portion of the exhibit was to be concrete, while the surrounding walls were to be built with DensGlass Gold gypsum sheathing from Georgia Pacific (Atlanta).

It seemed a reasonable solution, but it set aside the fact that penguins can make a mess and that cleaning up after them is definitely an issue.

The upshot was that the entire exhibit had to be able to withstand high-pressure water-jet cleaning as well as mechanical brushing. Basically, the management decided that what they wanted was a facility that could be cleaned from top to bottom without having to worry about exposing the walls to water – easy to achieve with concrete, not so easy with gypsum sheathing.

This sent the designers on a quest for a material that could run up beyond the shell and onto the walls and adhere effectively to both materials as a monolithic finish that would withstand the water jets and the brushes as well as the high pH levels caused by penguin waste. This led them to us and our coating system, which has the ability to adhere to a variety of substrates while providing a pH-resistant, non-toxic finish – all within budget.

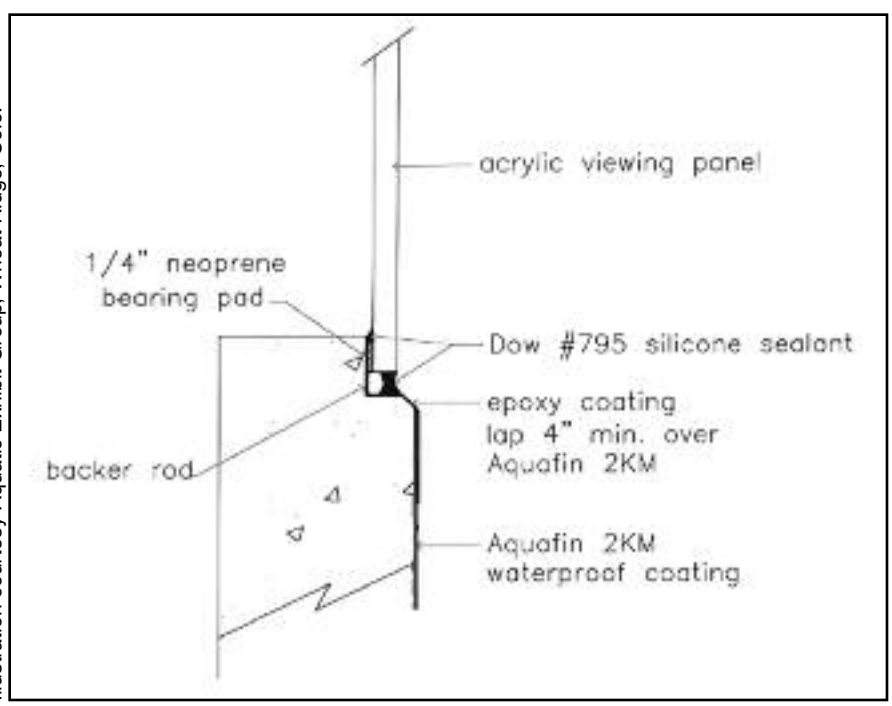


Illustration courtesy Aquatic Exhibit Group, Wheat Ridge, Colo.

Photo: Aquatic Exhibit Group

In more elaborate projects, all sorts of complex, additional shell penetrations can become factors in the waterproofing program. In the case of Sea Life Arizona, for example, the decorative elements within the 160,000-gallon main tank all had to be anchored into the shell, and the installation of the acrylic viewing tunnel was so complex that even we brought in a waterproofing consultant to make certain everything would perform as expected.

Photos by Grant Brummett, www.grantbrummett.com

reaching out

Clearly, these sorts of zoological and marine environments pose unusual challenges to any company that gets involved in such projects. But the lessons about waterproofing to be learned in these critical applications definitely carry over to other projects where adequate waterproofing is an issue.

The keys include good planning coupled with careful installation. More than once, we've been called in after a system has failed, and invariably it has to do with the fact that the wrong product was selected – or the right product was used improperly. It's not that they didn't specifically call *us*, because there are other suppliers out there who do a good job with waterproofing Instead, the project team hadn't seen a need to get expert help early in the design process and ended up needing to foot the bill for what proved to be a *tremendously* expensive repair job.

If you take only one message from this article, it should be this: If a project calls for it, there are no shortcuts when it comes to waterproofing. This is why we always stress the importance of working with experts who understand product selection and application and know the sorts of risks that come with compromise.

You don't need to work on a penguin exhibit or a shark tank to appreciate the value of getting things right the first time through. The lessons to be learned in those critical and even life-or-death applications easily transfer to any context where care is required and you don't want to leave the success of a project to chance.

If you do get the opportunity to pursue this sort of work, keep your mind open and recognize the fact that there lots of professionals out there who are ready to help – including some, like us, who specialize in keeping water where it belongs!

Plants and swimming pools go together beautifully, says watershaper James Robyn, particularly when a pool is flanked by a gorgeous stream and pond. And as he observes in discussing a recent project that included participation of master watergardener Anthony Archer Wills, it gets even more interesting when you set things up in such a way that all of the systems can be combined into one fully functional 'natural pool' in the future.

Planting a Pool

By James Robyn

When these clients decided that they wanted to have a swimming pool, they knew above all else that they did *not* want another box of blue water.

By contrast, as avid patrons of Disney World, the Princeton, N.J., homeowners had decided that their pool should be what they called "Disney natural" – not as completely naturalistic as a real pond, but natural enough so that they and their children could suspend disbelief and pretend that they were swimming in a pond.

Before we came on the scene, the clients had purchased an adjacent property to allow for the expansion of their outdoor spaces in a series of outdoor rooms that were to be functional while maintaining a natural feel. To that end, the couple brought in a talented landscape architect, Brian Meneghin of nearby Pennington, N.J., to begin brainstorming the project and establish design criteria.

The pool, for instance, had to have an adult area as well as a kids' area. It also had to be long enough for lap-swimming and deep enough in one section to accommodate a diving board. And in addition to a beach entry and a wooden dock, there had to be a spa ready for year-round use as well as planting beds adjacent to the pool.

It was a heap of ideas from the start, and the clear challenge was to sort everything out and create a setting that aligned with the clients' "Disney natural" vision.

A Key Question

Meneghin positioned the pool on a large expanse of lawn that tied it into views of the surrounding wooded areas. He started with an irregularly shaped, 60-foot-long vessel to accommodate lap swimming not just by the clients, but also for the training rituals of a triathlete relative. The wooden dock was positioned next to the beach entry and at an angle askew to the edge of the pool, and the spa sat on the opposite side.

The clients were happy with the scheme and began looking for a builder in July 2009. A Google search of "natural swimming pools" brought up our firm, Rin Robyn Pools of Far Hills, N.J., and Meneghin contacted us for a preliminary conversation about the project.

My wife Hae-Sun and I soon met with the clients, letting them know that not only did we own and operate Rin Robyn Pools – a design/build firm specializing in upscale custom pools

– but that we also own and operate BioNova Natural Pools, the North American licensee for the European originators of swimming ponds that use plants to clarify and purify the water in place of chemicals.

We started by asking: "Do you want to build a *sterile* water pool or a *natural* water pool?" (Credit where it's due: Our BioNova Dealer/Partner, Michael Logsdon of LandDesign in Boerne, Texas, came up with this wonderfully provocative, conversation-generating question.)

Intrigued by the "green" possibilities of the natural-pool concept, the clients pressed us for details on the technology and the water quality. Knowing how important it is to set clients' expectations correctly, we showed them lots of photographs and described how the system works – making it clear that, when all is said and done, what we produce is the clearest, cleanest pond water they'd ever see. Nevertheless, we reminded them, it *is* pond water and would have some algae in it as well as a noticeable biofilm that would form on the walls and floor and in the planted zones.

The clients held a family meeting to discuss the concept and came out of it wanting a compromise: While the natural-pool concept came with a look they very much wanted, they weren't up to dealing with the biofilm and algae. No problem, we replied, knowing we could come up with something special and unique that would give them what they wanted while involving them in some new and different ideas about the design and construction of swimming pools.

They were up for it and, in August 2009, engaged us to continue refining the pool design and define its key details. Using AutoCad drawings and SketchUp renderings to convey our concepts over the Internet, Hae-Sun and I conducted a number of virtual meetings with the clients to review and eventually finalize the design.

The clients led us to develop a number of playful details in the design with their ardent desire to capture the Disney spirit in their backyard. These included (among others) a thermal-ledge lagoon, a spa-side campfire, submerged stepping stones through the planted area and a large wooden dock with ladder.

Dealing with the Details

One of our early decisions had to do with widening the pool and lengthening it slightly. The former adjustment was intended to accommodate an eight-foot lap lane down the center of the pool (wide enough for two swimmers), the latter to include shallow rounded ends that reached beyond the squared-off end points of the lap lane. That lane was still 60 feet long – exactly 88 laps to the mile.

Next, we added a large, 12-inch-deep thermal ledge in the shallow end of the pool, including stanchions for two umbrellas and a curvaceous transition to

the deeper water of the shallow end. Meneghin had designed a lovely, curving wall for the pool that actually wound its way back into the water to separate the beach entry from the shallow end – a peninsular breakwater we incorporated as the boundary for the thermal ledge.

We then configured the deep end of the pool to allow for a diving board the clients wanted. On either side of the board, we inserted benches to allow for easy exits from the deep end. We also specified a ladder that was to go from the pool up onto the wooden dock.

The main change we made to the original design had to do with moving the spa and changing it to have a more irregular shape. This was, as we saw it, the key to creating a naturalistic "source" for the pool's water: In this scheme, water was to weep out of a natural-looking cluster of rocks and flow down a small spring-like stream – first into the spa and then into the pool.

To implement this wetland part of the project, we contacted renowned watergardener Anthony Archer Wills, who came with his partner Pauline to consult on the design and its execution.

With all of this in place, we reintroduced the design to the clients and the landscape architect. This included a transitional pond-edge treatment meant to separate the pool from the stream and pond – a chamfered, variable-width shoulder of the pool with river rounds embedded in it.

In addition, instead of inserting plant beds *adjacent* to the pool (as the clients had initially requested), we placed these beds *inside* the pond. In keeping with BioNova's principles of design for swimming ponds, we established separation walls between the pond's swimming and planted zones to keep swimmers from disturbing the roots of the plants.

In consultation with our European partners, we defined the plumbing plan for the planted zone and followed their special recipe for the gravel strata in which the plants were to be rooted.

As the project took shape, our design conversations with the clients went back and forth mostly over the Internet, with discussions guided by AutoCAD drawings and SketchUp renderings (including the near-final one seen here) we sent to them.

An Unfolding Program

As all of these design adjustments and additions evolved, we kept up a steady schedule of meetings with the clients and the landscape architect to refine all of the details. Because we would be growing plants in the pool's water, for example, we couldn't use chlorine and discussed a range of alternatives before specifying a commercial-size ozone generator from Del Ozone (San Luis Obispo, Calif.) and an ultraviolet-light sterilizer from BioLab (Lawrenceville, Ga.).

The clients also wanted an unobtrusive cleaning technology, so we chose the PC2000 in-floor automatic cleaning system from Paramount Pool & Spa Systems (Chandler, Ariz.). We then rounded out the equipment pad with variable-flow pumps, sand filters, heaters and control systems, all from Pentair Water Pool & Spa (Sanford, N.C.). The pumps, sand filters and heaters were configured to run as two separate, parallel systems: In the event any one unit goes down, there's always a backup on hand to keep the pool up and running.

We decided early on that the pool's interior finish would be PebbleTec (Pebble Technology, Scottsdale, Ariz.), but we wanted a deeper green than was available in the company's standard colors. Northeast representative Cliff Scheiber stepped up and had the staff in Arizona develop a custom color to provide the deeper shade we wanted. The result is a blend that our clients now call "Robyn Green."

By early November, the design work was complete and the clients were delighted. All along, however, they had wanted to include a large pool house and patio as part of the project, but a self-imposed deadline was looming: They had promised their children that the pool would be ready for them by the time school let out for summer early in June 2010.

To make that possible, we set aside the plans for the pool house and large patio areas and put all of our focus on finishing the pool. We received the go ahead in mid-December to start with the engineering drawings and the building-permit process, after which our project manager, Todd Benson, took control on site.

Building in New Jersey in February can be incredibly difficult, but Benson managed to get the excavation accomplished before and between a pair of blizzards. (Twice in 28 days, he and his laborers had to shovel snow out of the excavation to keep the installation process moving through the plumbing and steel phases.)

Once everything was in place and bonded, the inspectors came in, approved what we were doing and gave us the green light to shoot the shell. Through this entire process, Benson's use of Microsoft's Project Management software kept everyone on track and focused on the early-June completion date.

A Credible Source

As construction moved ahead, Anthony Archer Wills came to the site to work on the source for the pond portion of the system. His scheme occupied approximately 260 square feet of area that would be sealed off with a rubber pond liner (from Firestone Specialty Products, Indianapolis) and covered with boulders, rocks and stone to create a naturalistic illusion for the stream's headwaters.

Several trips to a large quarry in central Pennsylvania resulted in his picking out each and every boulder and rock that would be used on the project.

His work is filled with interesting details, including the large steppingstones he set up as a pathway across the source to allow visitors to move safely through the waterfeature. He also scattered additional large boulders around the site and away from the water to create the impression that the rockwork associated with the stream was completely indigenous.

One of the many landscape pieces weighed in at nearly ten tons. With the help of Corbett Excavators and its John Deere 160, we were able to place it near the deep end of the pool. (I am convinced that, if the clients ever decide to remove the diving board, we could just nudge this big rock over a few feet and allow it to become the diving rock I originally envisioned.)

By May, everything was coming together nicely and we were getting ready to have Poolside Plastering (Royersford, Pa.), the authorized local PebbleTec applicators, place our custom-colored finish in the pool. In preparation, we set the boulders on the edge of the beach entry and on the pond's edge. We also delineated the lap lane by using an idea from the clients – that is, by placing small stones similar in color to the pebble finish. Visually, they

There's much about this watershape that looks completely 'usual' in a highly customized sort of way, including the underwater steps and benches, the broad thermal ledge and the beach entry – all marked by their beautiful pebble finishes. The main odd element is the proximity of the plants and the way they reach across the pool's perceived perimeter.

don't pop – in fact, you can barely see them – but when you're looking for them while swimming laps, they're easy to follow.

Finally, in a nod to serendipity and to fuel future treasure-hunting pool games, we "hid" 31 pieces of beautifully radiant Lightstreams Glass Tile (Santa Clara, Calif.) in various places around the pool.

As this was happening, our pool plumber and electrician Jerry Oselador put the finishing touches on the equipment pad. He installed the tandem pump and filter systems along with the dual heaters. He also powered the in-floor cleaning system with another of Pentair's variable-flow pumps. Finally, he tied the spa into the mix in such a way that it, too, can run off either of the parallel systems.

Our intention here was to set things up in such a way that if the clients ever change their minds and want to go with a truly natural swimming pool, we can alter the plumbing in such a way that the water will all flow within one unified green system instead of as two separate watershapes

Fine Finish

All of these processes came off without any hitches, and the pool's interior finish

The source for the spa's water is an overtly naturalistic part of the composition, but even here it's made an interactive part of the setting by virtue of the stepping stones Anthony Archer Wills included to let bathers move around to enjoy details of the setting at close hand.

Ultimately, this project is very much about the plants and the ways they blur the physical and functional distinctions between a swimming pool and a pond. In this instance, the result is a hybrid that is a bit of both, but it's been set up in such a way that, if the clients change their minds, it can readily be converted into a fully natural swimming pool with water filtered through the planted areas.

had exactly the visual depth and quality for which we'd all been hoping. Once the pool was filled and the equipment started, we brought in the special gravel mix for the planted zones and, with help from Archer Wills, selected and installed the plant materials in the pond area.

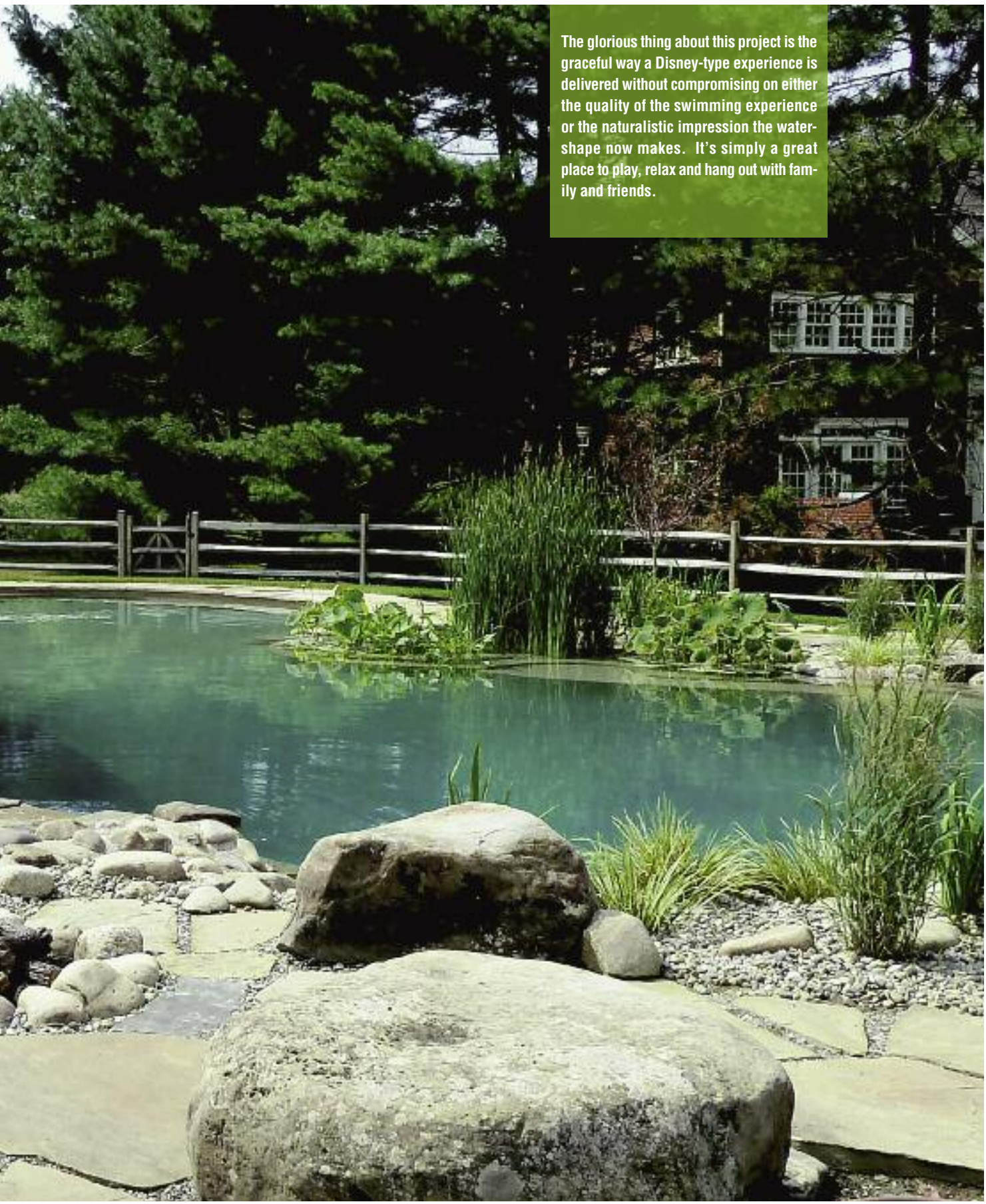
These plants included cattails, several varieties of flowering water lilies, flowering American lotus and pickerel weed (*Pontederia cordata*), all planted within the pond. Our master carpenters, Werner Herzig and Eric Rosseland, finished the wooden dock, which they'd made with Ipé, the South American hardwood. We completed their work with a wood-handled pool ladder we'd found on one of our trips to Europe.

Completing the "Disney natural" program with another fun touch, we added a rock-circle "campfire" next to the spa, surrounding it with seating boulders. The fire feature and its ceramic logs use an electronic-ignition gas system from Grand Effects (Irvine, Calif.) that can be controlled with the spa-side control. Instantly available for toasting marshmallows in June, it will also lend the spa a warm ambience through New Jersey's winters.

It was a push, but we met our June deadline – and couldn't help noticing that doing so had kept Todd Benson more than fully occupied for many months (including lots of 70-hour weeks). So we rewarded him and his ever-patient family with a trip to Disney World – where, naturally, fun in Typhoon Lagoon and at Blizzard Beach made him come home with all sorts of new ideas for pools.

For their parts, our clients and their children (and the triathlete) swam happily all through the summer of 2010 – one of the hottest on record for New Jersey – and tell us they're looking forward to using their spa all winter.

It's hard for us to imagine a better project – a grand collaboration between adventurous clients, a talented landscape architect, a renowned watergardener and our own company, with its deep and abiding interest in making pools as natural as they can be. We've set a personal high-water mark with this unique project – and we're moving forward with some new projects that will be just as interesting and fun!



The glorious thing about this project is the graceful way a Disney-type experience is delivered without compromising on either the quality of the swimming experience or the naturalistic impression the watershape now makes. It's simply a great place to play, relax and hang out with family and friends.

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In the Spotlight

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

Pool/Spa Filters

WATERWAY PLASTICS (Oxnard, CA) offers Crystal Water Filters for pools and spas. Designed with two-and-a-half-inch internal piping to minimize restrictions and improve water flow for efficient operation, the cartridge models have four filter elements to simplify element removal and servicing, while the diatomaceous-earth models have curved vertical grids for maximum surface area and more dirt capture.

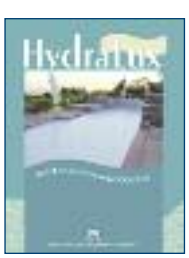
Concrete Coating

L.M. SCOFIELD (Los Angeles, CA) has introduced SolaChrome High-SRI Topping, a premium-quality system designed to provide a cooling, heat-reflective surface on exterior concrete both new and old. Ideal for pool decks and waterparks where cooler pavement is desired, the easy-to-mix, trowelable cementitious material comes in 24 colors and cures to create a hard, abrasion-resistant wear surface.

Natural Swimming Pools

BIONOVA NATURAL POOLS (Hackettstown, NJ) has published literature on its approach to the design and construction of natural swimming pools. The 12-page, full-color brochure defines a sustainable, water-conserving, ecologically sound method in which hand-selected plants – rooted hydroponically in a special gravel substrate – serve as biological filters for water circulated by energy-efficient pumps.

Floating Pool Covers



AQUAMATIC COVER SYSTEMS (Gilroy, CA) offers literature on the Hydrolux line of floating pool and spa covers. Made up of buoyant, sealed PVC slats that can be cut to fit virtually any converging shape, the system requires none of the tracks, ropes or leading-edge bars of traditional cover systems – and multiple covers can be deployed from hidden recesses in a pool's floor to deal with complex pool shapes.

Surface-Treatment System

AQURON (Rockwall, TX) has introduced a collection of products designed to seal and waterproof cementitious and stone surfaces in and around watershapes to stop problems related to water intrusion before they start. The system includes CPSP, a concrete pool-shell protector; MGS, a mortar and grout solution; Invisi-Shield, a stone and concrete sealer; and Invisi-Dec, an elastomeric deck coating.

Granite Pavers

RECYCLED GRANITE (Chicago, IL) offers pavers and tiles made from 100-percent recycled granite. Working with scraps left over from primary granite fabrication, the discarded material is processed and cut into permeable pavers and decorative tiles that have the look and feel of custom stone. Available in various shapes, sizes and colors, the products are three times stronger than concrete.

For more info, go to www.watershapes.com/ads

Coping Forms

VASTEC USA (Frankford, DE) offers flexible aluminum coping forms for use with fiberglass pools. The powder-coated units attach to the top of the fiberglass walls and create a frame for a concrete deck, and they bend to fit any shape. Just two workers can get the job done – no special tools required – and it doesn't matter if the pool is perfectly level, as coping shims can be used for a level finished product.

Stone Sealer

DECK-O-SEAL (Hampshire, IL) offers Deck-O-Shield Plus, a premium-grade, ready-to-use, water-based sealer formulated for use on natural stone. Designed to seal porous surfaces and ideal for use with pool copings and decks to protect them from salt penetration and the spalling caused by freeze/thaw cycles, the product also resists stains and can be used on stone as well as tile, concrete, pavers and grout.

Glass Accent Tiles

LIGHTSTREAMS GLASS TILE (Santa Clara, CA) offers Jewel Glass Accent Tiles. These decorative strips are designed for use on steps, benches and waterlines and feature random patterns and colors cut into rectangles that are nominally 7/8-inches high (in varying widths) mounted on 12-inch mesh strips. The glass comes from the company's regular patterns, but special looks are added to make every strip unique.

Pool-Access System

PNEUMATIC VACUUM ELEVATORS (Miami, FL) offers a bather-access system for use with swimming pools. Adaptable to any style of pool, the unit is secured with only four anchors and is powered by compressed air, so there is no electrical exposure near the water. Push button controls on the platform and on deck drive the heat-resistant, non-slip platform, which has a lift capacity of 450 pounds.

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In the Spotlight

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Protective Coatings

AQUAFIN (Elkton, MD) offers 2K/M, a cementitious, acrylic-emulsion-based, highly flexible protective coating and waterproofing barrier for a variety of watershaping and decking applications. The solvent-free, two-component material is resistant to water, moisture and abrasion and can be used as a stand-alone product or may be overcoated with flexible or rigid mortars or coatings for uniform appearance.

Paver Drains

FRANK WALL ENTERPRISES (Columbus, MS) offers a new paver drain that is 2-3/8-inches high to align with standard pavers. Designed for any application where drainage is needed in fields of pavers, the units are held in place by securing clips that go underneath the pavers and are configured so that clips can be alternated from side to side or placed on one side to fit flush against a wall or building.

Sheer Waterfalls

PONDBUILDER (Saginaw, MI) has introduced FormalFalls for use with all types of retaining walls. The sheer waterfall highlights any outdoor living space, and the system includes LED lighting that offers seven rotating or static colors that can be remote-controlled from up to 150 feet away. Made with a stainless steel design for durability, the units require no winterization and come in 16- and 28-inch widths.

Cover Software

PLASTIMAYD POOL PRODUCTS (Oregon City, OR) has released software for builders to use when plotting custom shapes for safety covers. Designed for use in a laptop while the builder or installer is on site and can readily confirm measurements, the program allows for inputting dimensions, then checks to ensure that the final drawing matches the actual pool and deck configuration for a true custom fit.

Mixing Machines

MACALITE EQUIPMENT (Phoenix, AZ) offers mortar and plaster mixers and pumps for pool plaster, masonry, stucco and related applications along with an extensive line of tools including booster pumps, manifolds, trowels, hoses, spike plates, step-forming tools, wheelbarrows, brushes and more. The company also stocks a complete inventory of replacement parts for mixers and pumps.

Salt Chlorinator

HAYWARD POOL PRODUCTS (Elizabeth, NJ) has introduced the Aqua Plus 16V, an automation and salt-chlorination system that gives pool owners expanded control over functions from lighting to purification through a single device. The unit has eight relays, plus soft keys for use with grouped functions and lighting, and has an integrated salt chlorination system for pools of up to 40,000 gallons.

Heat Pumps

PENTAIR WATER COMMERCIAL POOL & AQUATICS (Sanford, NC) has introduced the UltraTemp Heat Pump for use with high-end residential and commercial pools. Designed to reduce heating costs with a three-phase power input that provides greater energy efficiency than single-phase units, the system also controls refrigerant flow for higher efficiency and resists freezing in cold weather.

LED Lighting

CRYSTAL FOUNTAINS (Concord, Ontario, Canada) offers compact, five-watt, 12-volt DC LED lights. Designed for use in tight spaces or where the presence of fixtures needs to be downplayed, the units are just an inch and a quarter in diameter and come with full RGB color-changing for 16 million different color possibilities. In addition, the long-lasting LED lights generate less heat and require less maintenance.

The information seen here has been provided to WaterShapes by product suppliers.
To contact these companies for details, please use the live links at **www.watershapes.com/spotlight**.

Pool Enclosures

CCSI INTERNATIONAL (Garden Prairie, IL) offers Garden Prairie enclosures. Custom-designed and engineered for specific project requirements, the units come in a range of powder-coated colors and can be freestanding with double-slope roofs or attached to existing structures with one-slope roofs. Polycarbonate roof panels open manually or automatically, and walls are made of tempered safety glass.

Pool-Sanitizing System

TUCKER PRODUCTS (Martinez, CA) offers Chlorine Geni, a salt chlorination system in which salt is added to the device rather than to the pool's water. The device limits chemical handling and extends equipment life by working independent of the circulation system, using fresh tap water and automatically feeding chlorine to the water. Balanced pH is maintained by using a simple manual control valve.

Fire-Ignition System

OUTDOOR FIRE CONCEPTS (Las Cruces, NM) offers all-weather electronic ignition systems for outdoor fire features. The units are compatible with pool controls and have internally mounted, waterproof controllers that allow fires to stay lit through rain, snow and winds up to 40 miles per hour. They also have a pilot design that keeps foreign objects from entering and clogging the pilot's burner orifice.

Permeable Pavers

WHITACRE GREER (Alliance, OH) offers four-by-eight-by-two-and-a-quarter-inch permeable pavers. With eight percent void space and ADA-compliant quarter-inch joint gaps, the color-fast clay bricks come in a full palette of colors (including custom blends) and are effective as part of stormwater management systems by reducing runoff, trapping pollutants and eliminating ponding water.

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WATERSHAPES

In the Spotlight

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Underwater LEDs

KICHLER LIGHTING (Cleveland, OH) offers the Design Pro LED two-in-one accent light. Intended for underwater use in ponds, fountains and other waterfeatures, the long-life lighting technology is virtually maintenance free and is double-encapsulated to ensure complete watertightness. It has in a compact, rugged, corrosion-resistant stainless-steel housing that can easily be tucked into tight spaces.

Utility Locating System

DITCH WITCH (Perry, OK) has introduced its 830R/T high-frequency electronic locating system. Designed for reliable performance, the device has the ability to trace poor conductors (such as ungrounded tracer wire) and locate short lengths of utility infrastructure better than low-frequency units. It's also easy to operate, ruggedly built and ideal for locating metallic pipe, cable, water or gas lines.

Compact Loader

CATERPILLAR (Peoria, IL) has introduced Model 259B3, a high-performance, highly maneuverable compact track loader. Made using a small-frame, a powerful engine and steel-embedded rubber tracks, the unit offers high breakout forces and strong hydraulics to get tough jobs done in confined spaces – a durable, versatile machine that works productively in poor soils and harsh environments.

Basketball Fixture

POOL SHOT (Ashtabula, OH) offers the Adjustable Varsity Basketball Game. The set includes an adjustable backboard that can be raised and lowered without any tools and features a rugged stability base with an all-plastic design, a large backboard and a regulation-size metal rim. Designed for durability, long life and near immunity to chlorinated water, sunlight and inclement weather, the unit assembles in minutes.

Automatic Pool Cleaner

WATER TECH (East Brunswick, NJ) has introduced the Hercules Power Rated 5000, an automatic pool cleaner designed for large residential or small commercial swimming pools up to 2,025 square feet. The unit automatically brushes and vacuums walls, sides, steps and even waterlines of pools and has an onboard pump that filters 4,225 gallons of water per hour with a reusable two micron filter bag.

Composite Decking

TIMBERTECH (Wilmington, OH) has introduced Earthwood Evolutions, a capped composite decking system. The system includes fully capped planks made with the company's HydroLock technology for superior moisture resistance to go along with fine aesthetics and great durability. The material resists stains, scratches and fading and is available in three colors: Pacific Teak, Pacific Walnut and Pacific Rosewood.

LED Packages

EASYPRO POND PRODUCTS (Grant, MI) offers three-pack underwater LED lights. Each unit is 2.75 inches in diameter and includes 48 diodes for bright, intense light. The LEDs have an 80,000-hour bulb rating for years of maintenance-free performance, and the package includes a 15-foot power cord to the first light with quick-attach 65-inch cord extensions between the first, second and third lights.

Decorative Deck Stones

MATRIX Z (Fort Lauderdale, FL) offers the SeaStone line of cementitious decking stones. Made using natural fossilized shells and other aggregates fused under high pressure with the company's proprietary admixture, every piece is unique in appearance and has the look of natural stone. The material has high compressive strength and low water-absorption qualities, making it suitable for wet/dry situations.

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Learn to Earn!

WaterShapes book reviewer Mike Farley has long been a strong proponent of personal and professional enrichment through reading.

For ten years, he's used his 'Book Notes' column to show how the information in the titles he picks can be applied to designing, engineering and building quality watershapes and the landscaping that surrounds them.

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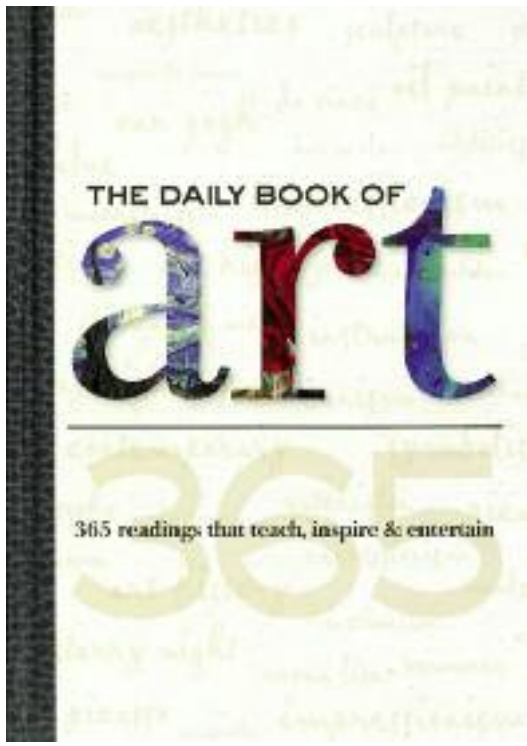
Book Notes

A Daily Dose

By Mike Farley



As I've mentioned before in this space, my education in landscape architecture pulled up lame when it came to instruction in art and art history. That shortfall has bothered me greatly as my career has progressed, but the silver lining is that I've been motivated to seek out sources I can use to teach myself what I think I need to know.

My latest find in this campaign is a wonderful book designed specifically to prompt personal voyages of exploration: It's called *The Daily Book of Art: 365 Readings That Teach, Inspire and Entertain* (Walter Foster Publishing, 2009) and delivers on its title's promise by providing a year's ration of 200-word descriptions of art and artists from a variety of thought-provoking perspectives.

The 376-page text was compiled by eight authors who organized it into ten rotating segments. The idea is simple: You pick up the book once a day, read an item (which takes practically no time at all) and then go on your way, contemplating what you've learned and maybe feeling inspired to continue with some research of your own. The approach is quite interactive and fun – and surprisingly gratifying when you consider that all you're receiving are relatively small bits of information each day.

The rotation of segments is important, because each day you read something completely different from the day before. For example, the first segment covers basics of the art world, from how contracts work to basic terminology including contrast, color theory and form. It's great information, but for most readers getting it in one big dose (as a long chapter, for instance) would make it tedious.

That's not what happens with this book, because the item on, say, art contracts is followed by an item on the philosophy of art and how it teaches, expresses ideas and triggers emotions. The changes of pace take you in completely different directions and stop the potential for boredom in its tracks.

After bits on philosophy, you'll see entries on art through the ages and how it changes with culture and history. Then come artist profiles, including a piece I read on Jackson Pollack. I'd heard of him, of course, but I'd never given much thought to his brand of modern painting or where he fit in the history of art. It piqued my interest enough that I googled him and spent some time getting more familiar with his work.

Another of the rotating sections covers art from around the world. This led to my discovery of The Bone Church in Prague – an architectural phenomenon made up entirely of human skeletons. Again, after reading the book's brief treatment, I went to the computer and pulled up loads of information on this uniquely macabre work of art.

(Knowing my teenage son has a taste for the unusual, I subsequently shared what I'd uncovered with him. Then it hit me: Here I am having a wonderfully weird conversation about art and art history with my son, all because I read a 200-word primer on a church made out of bones!)

Other sections roll through artistic oddities; unexpected art forms; museums and galleries and other places in which art is displayed and collected; and a great one offering five-step sketching exercises that are both instructive and great fun if you have any interest at all in learning how to draw.

What I love about this book is how it takes a subject as huge as "art" and breaks it down into easily consumable pieces – all while prompting me to dig for more. If you're looking for comprehensive discussions of art and its history, this is not the resource you want; but if you want an easy, enjoyable way to start exploring, this book might be just the ticket. WS

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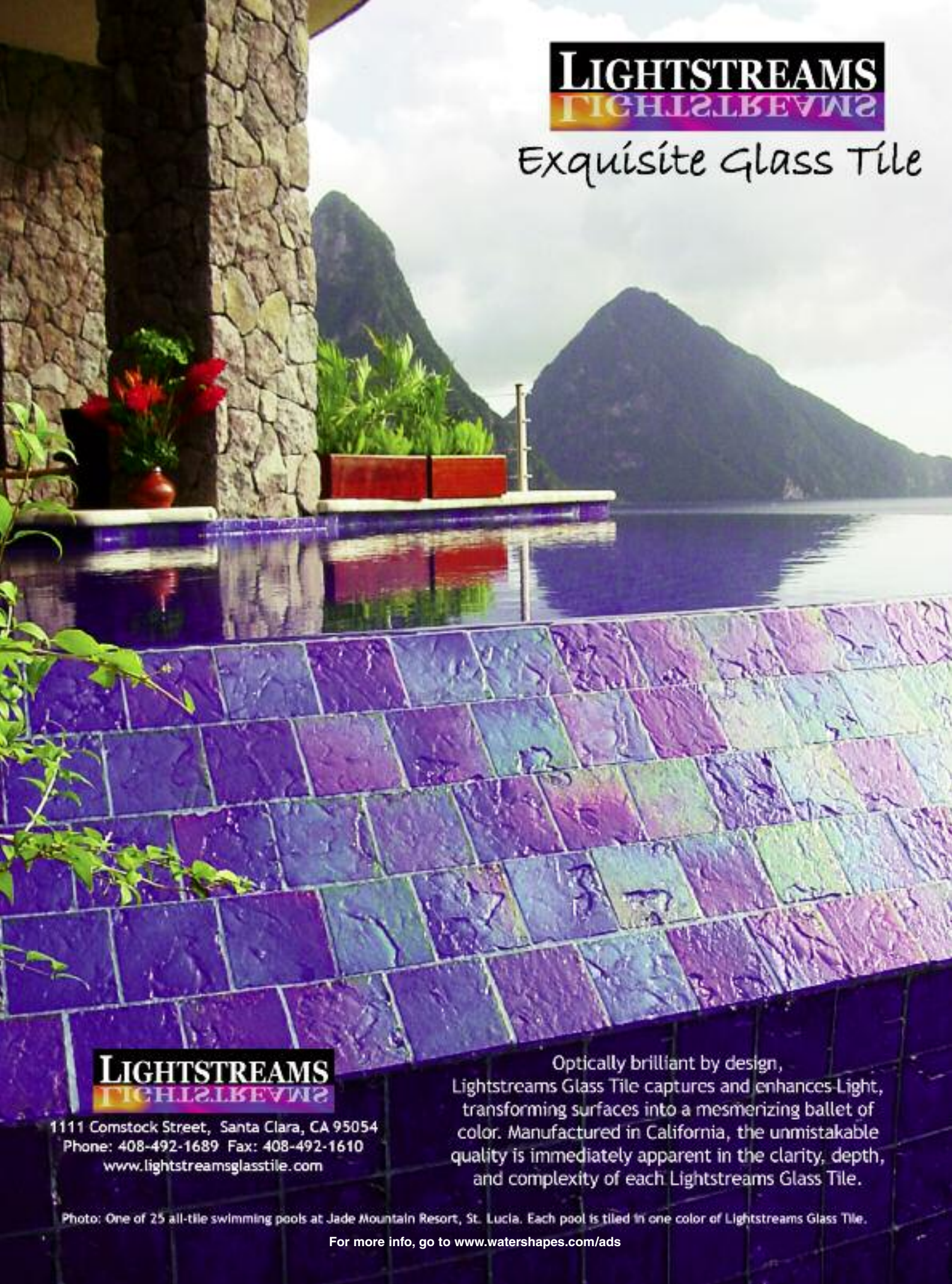
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