Inside: Stephanie Rose on Rocks

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Number 2
February 2004
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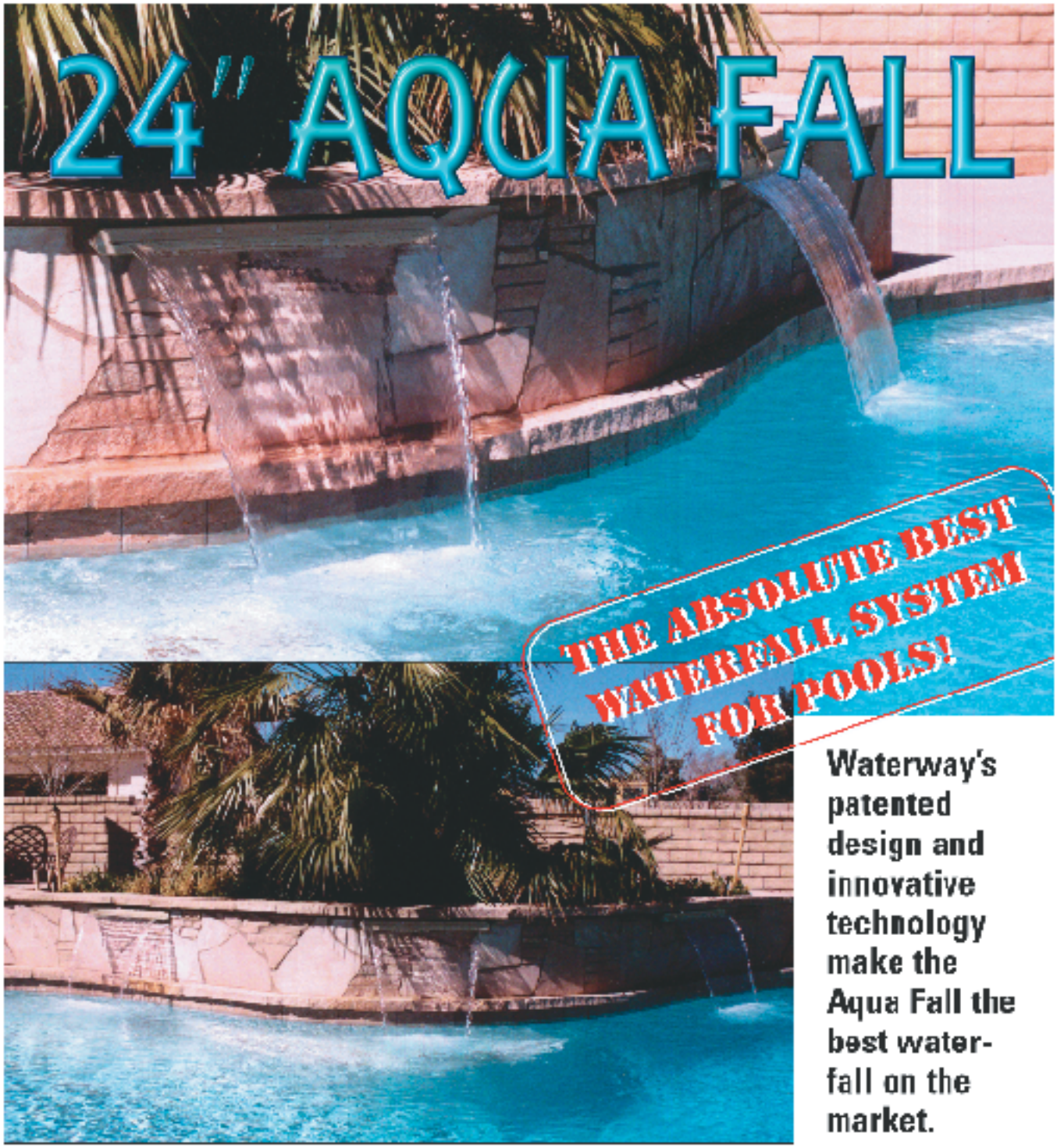

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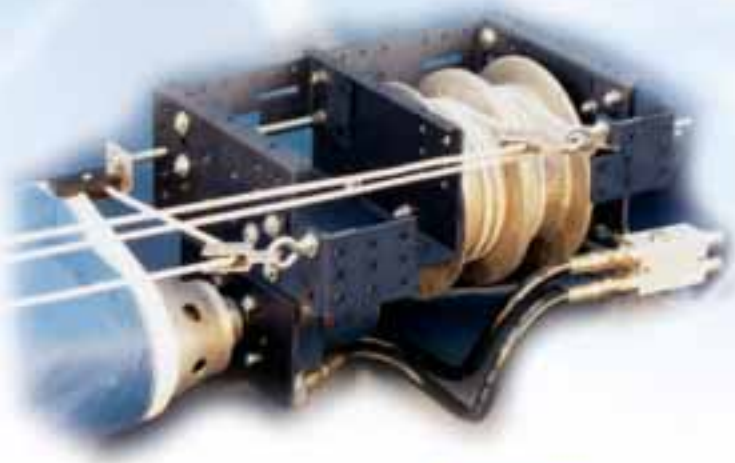

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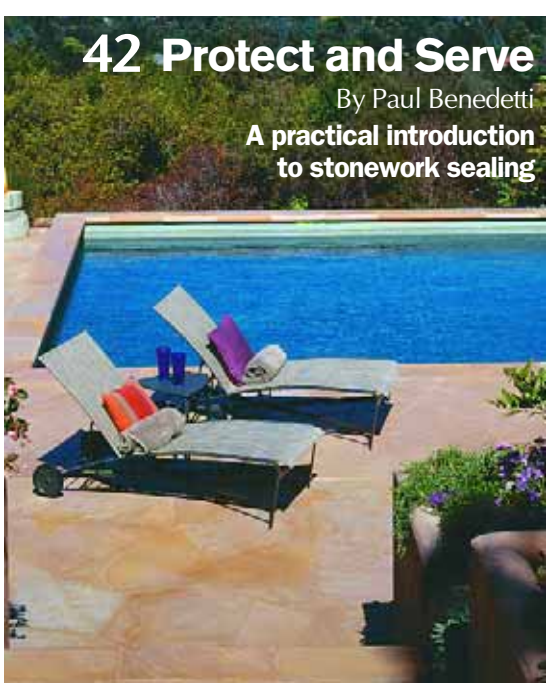

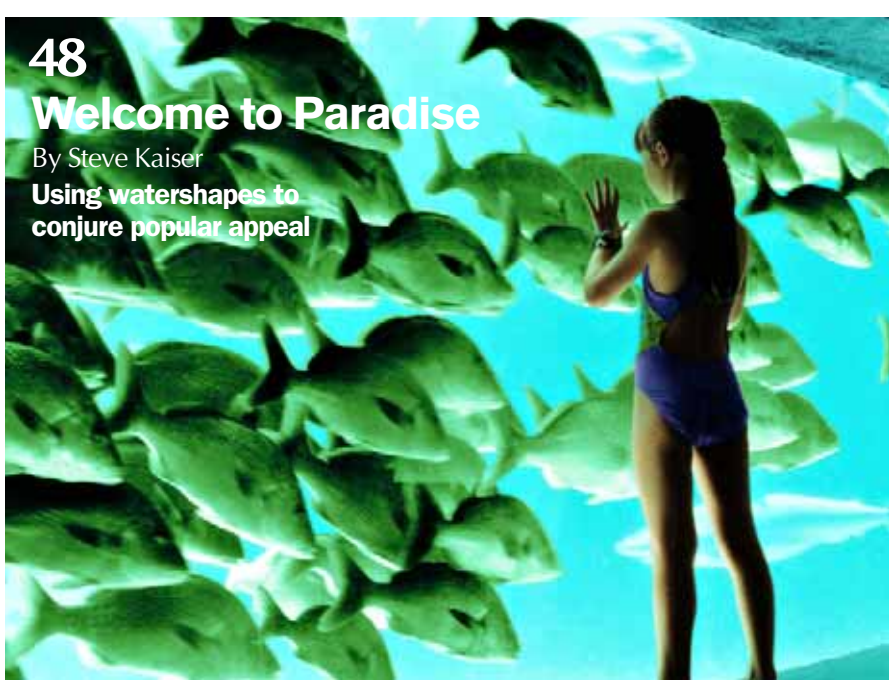

WATERSHAPES
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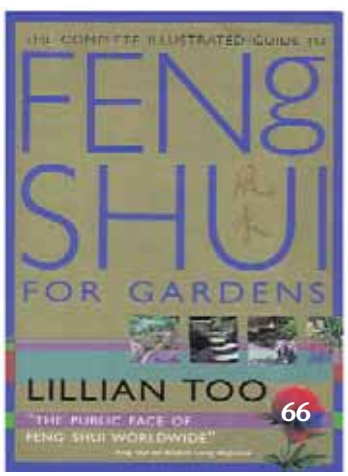
columns



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On the cover:
Photo courtesy Atlantis, Paradise Island, Bahamas

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By Eric Herman

Outside the Rocks

Sometimes I like clichés. That's tough and perhaps treasonous for an editor to admit, but there are certain phrases that truly resonate, and I stand by them for what I think are good reasons.

In recent years, for example, the words "outside the box" have come into all-too-frequent use, so much so that when invoking those words these days, the person saying them often feels sheepish at the utterance.

But a phrase such as that one is so pervasive, I think, because it really does offer a valuable shorthand suggesting that there's value in looking beyond the boundaries of concepts and behaviors that define the way things are usually done. It's much like "nothing ventured, nothing gained" – a cliché, yes, but a worthwhile observation just the same.

On page 42 of this issue, there's an article by a fellow who seems to revel in thinking outside the box. Paul Benedetti is a regular *WaterShapes* contributor, and in this case his discussion highlights the advantages that flow to those who look at things in unconventional ways.

To make his stonework as enduringly beautiful as possible, he looked to suppliers familiar to him in the pool industry – and then took the unusual step of going beyond those resources to find out what architects, homebuilders and stonemasons use in sealing and protecting their work once it's been installed. That may seem a small thing, but in a pool industry still hemmed in by convention, I see it as a breakthrough to be emulated. And what Paul most wanted to do was add value to his work as a watershaper.

Some of the products he writes about are not to be found at pool or landscape shows, and I admire both his passion and his willingness to take the time to learn about all of them. It may take a bit of digging to keep pace with him as he begins this important series of articles on products used in conjunction with natural stone and other hardscape materials, but his coverage of the topic, while provocative, is always practical and informative.

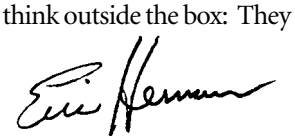
S S S

If I might also draw your attention to another article, please take note of "Welcome to Paradise" on page 48.

This is, quite simply, one of the most spectacular projects we've ever covered in *WaterShapes* – the tale of the creation of the resort property known as Atlantis, Paradise Island, Bahamas. We're proud that Steve Kaiser, the man in charge of the resort's amazing watershapes, has agreed to lead us on a tour of those facilities, and it's quite a ride.

I want to point out that the watershapes of Atlantis are so involved that they can barely be contained even in this outsized article. More important, however, is recognizing the fact that this high-flown property offers an incredible example of just how powerful watershapes can be, with due credit given to the way water defines the character of what can only be described as one of the world's most fantastic vacation spots.

It's an inspiration and maybe a jolt to all those who work with water. It's also fair to say that the folks who developed Atlantis didn't just think outside the box: They obliterated it completely just to get started.



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February's Writers

Clayton M. Varick is a project manager with Land Expressions LLC, a landscape architecture and construction firm based in Mead, Wash. A graduate of Washington State University, Varick grew up in the landscape business and worked for his father's firm, S. Varick Landscaping, in Seattle. That experience, coupled with his bachelor of science degree in Landscape Architecture, has enabled him to progress quickly at Land Expressions. At 27, he is manager of the company's Water Division, where attention to detail and dedication to the work have made him a valuable member of the company team.

Martha and **Randy Beard** own Pure Water Pools, a construction/service firm in Costa Mesa, Calif. They met in 1981 while both were working behind the scenes in the entertainment unit at Knott's Berry Farm. At the time, Randy also had a small pool-service business and convinced Martha (Marti) to invest in expanding the route. They purchased Pure Water Pools from another technician and have operated in the Costa Mesa/Newport Beach area ever since. As the route grew, both dropped their other jobs and focused entirely on the pool business as small repairs led to big repairs, big repairs to remodels, and remodels to new construction. Each year, they've seen their projects become more creative and technically challenging. Today, the firm works with many of the area's leading architects and landscape architects to create a range of custom watershapes for upscale commercial and residential clients.

Paul Benedetti is founder and vice president of Aquatic Technology, a custom swimming pool

design/build/service firm based in Morgan Hill, Calif. He began his work in the industry in 1991 as an independent service technician. He quickly moved into major repair and remodeling work, eventually transitioning into original designs and construction. He now builds extremely high-end residential pools for upscale clients in Northern California's Silicon Valley region, where he also offers his design services to architects and landscape architects. Benedetti's firm continues to service pools, including all of those he has built. He is a member of the Independent Pool & Spa Service Association and the National Spa & Pool Institute and is an associate member of the Genesis 3 Design Group.

Steve Kaiser is vice president of marine sciences and engineering for Kerzner International Bahamas Ltd. A specialist in the development and management of marine-science exhibits and facilities, he joined the company as director of waterfeatures in 1994 and oversaw design and development of the extensive watershape facilities at Atlantis, Paradise Island, Bahamas. He began his career in marine science in Hawaii, where he started out 20 years ago as a tank cleaner before being promoted to curator for a 350,000-gallon, open-ocean fish tank and then to director of fishes and facilities development. Kaiser left Atlantis for two years beginning in 2001 to help design the new Georgia Aquarium in Atlanta, a gift to the city from the founder of Home Depot. He also helped design a new waterpark planned for Tenerife in the Canary Islands before returning to Atlantis to direct development of Phase III for the property.

By Brian Van Bower

Finding Ways

Last month, I jumped into the New Year with a discussion of how the trends we face these days are influencing our recent experiences in business, society and life in general.

In doing so, we navigated through a mixed bag of factors – advancing technology, interesting economic times and complex legal conditions on the grand scale up alongside local, narrower issues having to do with the emergence of the watershaping business, the wayward nature of trade associations and the state of relevant education for our trades.

All that was intended to lay the foundation for this column's discussion of where we, as the watershaping industry, might be going in the months and years to come. Pure prognostication, however, is an imperfect process in which I won't indulge. Rather than get into the aimless game of offering predictions, I'll delve instead into some strategies that I'm currently employing to maximize positive outcomes based on what we know about where we are at this moment.

back to the present

As you may have noticed, I'm a big believer in coming to grips with the present. Where the past is accepted and the future is always uncertain, the moment in which we find ourselves at any given time is always a concrete condition we can observe and use to plan our next steps in tangible ways. More to the point, whatever condition exists in the present can, with care and energy, be changed for the better in the long run.

The watershaping industry has not taken success just in stride, but is stepping up to new levels and into new areas as consumer expectations have risen.

Looking specifically at the watershaping business and the feedback I get from my network of contacts in the United States and abroad, it's fair to start by saying that the various branches of the watershaping industry are all doing fairly well. And this is so despite the gross uncertainties of international conflict, a roller-coaster economy and a number of other mixed signals we can all observe in the world around us.

The simple fact is that most watershapers are now quite busy. Perhaps some projects have been downsized as a result of shrinkage of our clients' investment incomes, but the people I talk with are for the most part working hard to keep up with the demand for their services.

I believe that's so because we offer our clientele the opportunity to get away from a topsy-turvy world and the life issues that confront them daily. The respite our products offer from the rigors of this crazy world is now, more than ever, at the heart of what we're selling. This is reflected in the consumer-oriented publications about watershapes that have emerged in recent times along with resources that offer consumers new ways to see what we have to offer.

And the industry has responded well, taking success not just in stride but stepping up to new levels and into new areas as consumer expectations have risen.

By moving beyond the water's edge to incorporate such things as hardscape, plantings and entertainment areas, for example, and by learning to integrate exterior spaces with interior ones, today's "complete" watershapers are overtaking and surpassing those who operate

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in a traditional way and focus strictly inside the coping.

To move or continue to move in this integrative direction, it's worth mentioning that you can't do this without taking the time to think, reflect and learn. Right now, late in January or early in February, is a good time for most of us to set aside that time.

It's only too easy to put off this time for thinking and time simply for enjoying ourselves, especially as we deal with the challenges of the moment. Yes, the future is always uncertain, but if we don't give ourselves space in the here and now to look at where we are and where we want to be, we invariably end up cheating ourselves out of opportunities to move forward to new levels of success, satisfaction and happiness.

across the lines

I am indeed a big believer in the power of reflection and of casting one's mind into new areas of thought and action as a prelude to taking positive steps in those directions.

Speaking of the watershaping industry in general, I believe that this expansive thinking should include the thought that we should expand our sphere of engagement and involvement to the global level. In doing so, we can all exploit the value of ideas from industry groups, companies and individuals from other countries. Indeed, the potential in this exchange of interests, products and design ideas is tremendous and profound.

This runs counter to the current trend in this country where uncertainty abroad has caused many of us to think about fortifying our borders, staying at home and walling ourselves up in our own culture and economy. To my mind, however, current conditions may make this the most opportune of all times to think about reaching out to others in our field who live beyond our national borders.

On an industry level, this means that our trade associations and leaders need to be open to the possibilities and benefits of creating stronger international alliances. Whether this can happen for the traditional pool industry is questionable because of the mindset of its main trade group and that group's leaders, but it's my contention that to continue to expand our profession and compete effectively, we should engage foreign markets and welcome those from other countries who endeavor to participate in the U.S. marketplace. It's ever my hope that one or more of the organizations in which watershapers are involved will pick this cause up publicly and run with it.

Along those same inclusive lines, I believe that, as the watershaping industry, we must embrace the team concept.

As I pointed out in my last column, more and more projects involve construction and design teams that include a variety of professionals from nominally different industries. Yet our industry associations don't seem capable of grasp-

ing an inclusive spirit in structuring trade shows, conferences, educational programs or promotional/marketing programs. In this sense, it's fair to say that the way we watershapers are actually working is light years ahead of the thinking of those who are supposedly "leading" our industry.

There's currently no single group that directs and integrates the activities that orbit around creation of overall outdoor environments. It's my dream that such an entity and such a leadership will emerge. Perhaps if those of us from all walks of the watershaping trades began pushing for that level of cross-disciplinary integration, someday it might just happen.

damage control

One of the big points I made in January's column is that liability exposure and what many of us view as excessive judgments in lawsuits are hurting business.

Don't get me wrong: I'm not talking about people who have been harmed by the negligence of other people, but rather those suits that are driven by a mentality that, whenever something bad happens, the person or company with the most money that's somehow linked to an incident in some way, however remote, should be made to pay regardless of their actual level of responsibility.

As an industry and as individuals, I believe that it's critical to push for tort reform. This is another area where our trade associations, acting in concert, should step up to the plate and do something about the misery of those stung by this problem. After all, it affects each of us no matter what trade association you or I call home.

There's a tendency to look at these cases when they happen and simply be thankful that they're stinging someone else. That may be human nature, but it's a risky form of denial given current trends and the overall societal cost of this punitive form of litigation.

Frankly, I think we should all be outraged by the sorts of damages that are awarded in too many cases and that we should make our feelings known. I can only think that a trade alliance that encompasses pool builders, landscape architects, landscape designers, architects, landscape contractors and home builders would have greater clout than any of these organizations flying solo. (And I apologize if such cross-over efforts are already under way; if that's the case, the news is good but has been slow to travel!)

This leads me to the broader topics of government regulation and relations. In our society, it's clear that government is reactive rather than proactive and that it will very often act in the interest of those who shout the loudest. As an industry, we should take issue with those things with which we disagree – and that's another thing we've been slow to do in any sort of concerted way when we should, in fact, be pooling our collective resources.

Continued on page 14

Using tort reform to illustrate, the watershaping trades should reach out to each other. If we can come together with the common goal of pressing for consideration of tort reform, the burden of mounting a campaign in our shared interest would be spread around and ultimately would be more effective because we could muster greater numbers of voices expressing our view.

All of this takes enlightened minds with great vision, and I look forward to a day when some sort of multi-disciplinary council comes together to identify shared interests and begins the work of forging alliances and defining ways that we can all work together.

beating the drum

In looking toward our common interests as watershapers and where I think we're all heading as the New Year begins, it's impossible to escape another look at education.

The first part of improving current conditions is to recognize them for what they are, and I believe we've begun identifying our educational shortcomings – particularly in the pool and spa industry, where barriers to entry are low and there are no legitimate, enforceable requirements for education or continuing education.

I've seen up close and personal through the Genesis 3 Design Schools just how extreme the demand is for education. I have been disappointed, however, that despite the demand, there is still so little by way of formal education available to the watershaping trades.

My utopian vision of education for our trades includes college programs organized in different tracks in which watershaping practitioners not only become certifiably educated, but also can work toward developing specialties within the trade. I've heard that my friend, Genesis 3 instructor and regular *WaterShapes* contributor Mark Holden is now working to set up a water program in the landscape architecture curriculum at the California State Polytechnic University at Pomona. That's a huge step in the right direction.

Until we have quality education, those who merely put holes in the ground and fill them with water will remain and all of us will continue to be perceived as being part of a low-end, low-brow profession.

I think the time has come, however, that we should abandon the simplistic belief that *any* education is better than *no* education. We need instead to focus on quality and step away from the practice at trade shows and elsewhere where seminars are delivered by people who really have no business doing so. This will be a hard one to face because it's awkward to undermine the generous spirit and good

intentions of those who volunteer to teach. That said, the mere *desire* to teach does not necessarily *qualify* one to do so.

As an industry, we need to demand qualified instructors and not be afraid to reject teachers who all too often simply repeat flawed, incomplete or erroneous information they've picked up from other inadequate teachers. That means turning down volunteers – hard to do, but until it happens, bad information will continue to be regurgitated time and time again.

As it stands, it would seem we've come to a point where, in some cases, no information actually would be better than the stuff that's put across as fact in various educational settings. To be sure, water chemistry and heater repair will always be important, but for far too long our reliance on those sorts of tried-and-true topics has limited our frames of reference, alienated creative people, driven designers and builders out of trade-show classrooms and ultimately hurt the growth of watershaping as an endeavor, both in terms of revenue and of professional stature.

Until we have quality education, those who merely put holes in the ground and fill them with water will remain and all of us will continue to be perceived as being part of a low-end, low-brow profession. That, I think, is in nobody's best interest.

communicate at will

I'll leave this discussion with one last suggestion: When you get a chance, type your name into Google or some other search engine on your computer. Or try your company name and see what you come up with.

The Information Age gives us all a great opportunity to learn, communicate and promote ourselves. If you type in your name or your firm's name and nothing comes up, perhaps you're missing an opportunity to spread the word about your business or about yourself.

By contrast, if you perform this quick exercise and are surprised by some of the things you see, perhaps you'll begin to understand more fully the value and expansive nature of the Information Superhighway.

Bottom line: In facing the present in all of its details, we are also embracing the future – but only if we are persistent and apply what we learn. There's hard work involved in assessing where you are today and planning for tomorrow, but I'm confident that if you engage that process, important ideas and plans of action will emerge in ways that none of us can ever predict. WS

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

By Stephanie Rose

Rocky Pleasures

If you apply a 'less is more' attitude, it will be all that much easier to maintain the all-important balance between the architecture and landscape style you're using with the rocks you incorporate.

Rocks are, in my opinion, among the most versatile of all elements that can be added to landscape designs. As was discussed in my last column, they can be used to add texture or dimension or retain soil; they can also be used to add background or hide eyesores, and there are myriad other uses creative designers can find for them.

Of course, different design styles call for different uses of rocks, stones and pebbles. An Asian garden, for example, might use them to simulate or represent water or mountains in a landscape, while the very same stones used in a cottage or natural setting might serve no purpose beyond providing a place to sit or a focal point that sets off plants behind it.

Here are some suggestions for using rocks in a variety of design styles:

s **Contemporary.** Here, rocks of various sizes and shapes can be used to complement or reinforce the strong planes and lines found in contemporary architecture. Beds of gravel, for instance, can be used to continue flat planes beyond hardscape surfaces, as with concrete pathways bordered by gravel beds with minimal plantings – particularly effective in ultra-contemporary settings.

Boulders serve very well when placed by themselves as focal points in these gardens. In fact, truly unusual stones – large specimens covered with unique striations or flecks of reflective quartz, for example – may even be used as artwork within these landscapes.

s **Asian.** Gravel and small pebbles are extensively used in Zen gardens, which are usually devoid of plant life. They're also common, as was mentioned above, in lush Asian gardens, where they symbolize rivers or other bodies of water. Larger flat stones are frequently used as stepping stones through forested paths, while boulders and larger rocks serve to represent distant mountains. These large specimens are also key stationary elements in Zen gardens.

s **Cottage or Natural.** There are so many uses for rocks in cottage or natural settings that you'd be hard pressed to find one that doesn't use them. Gravel and pebbles make great pathways – indeed, most classic cottage or English gardens use gravel pathways as transitions from one area to another – and they even serve to pave driveways within large-scale cottage designs.

These pathways are very low maintenance, but they'll require replenishing every few years if heavily trafficked. Flagstones work well in providing access to areas that need to be tended or as pathways through dense plantings. For their part, boulders work beautifully in providing respite for "weary" garden visitors while setting off strappy-leafed plants or

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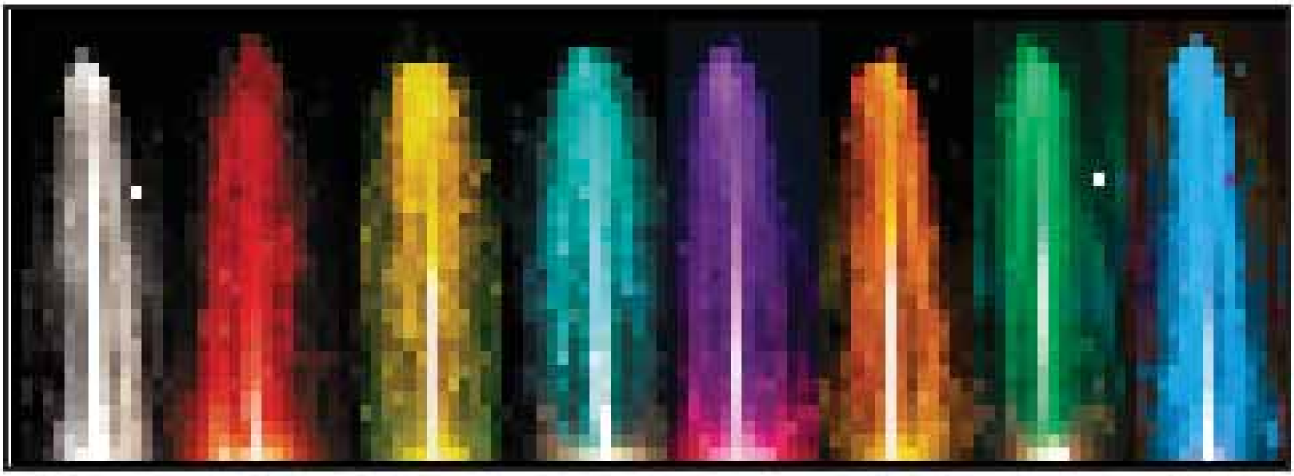

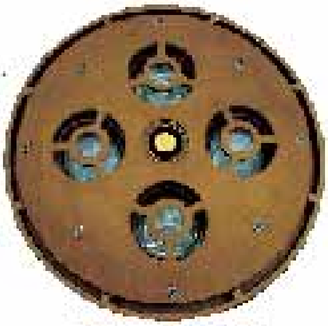

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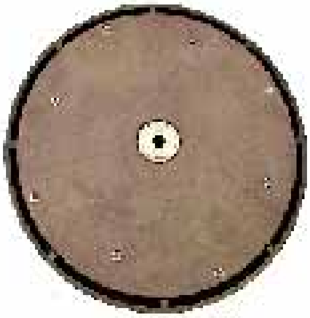

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adding firmer texture to an otherwise medium-to-soft-textured landscape.

Woodland. To gain the proper rocky effect in these spaces, you almost need to stand in one spot and cast rocks in all directions – at least that's the way it looks when you hike into a woodland setting and take the time to observe just how randomly rocks appear in the landscape.

Think of retreating glaciers dropping rock material out of their frozen massiveness: These rocks would never be lined up or evenly piled or clustered, and all would literally have the entirely natural appearance of being unplanned. Pebbles and small stones are scattered, flatter stones are typically observed beside water and large rocks are all over the place, quite unordered.

Traditional. With a more traditional home built in, for example, the ranch style, gravel and pebbles make great pathways and outstanding dog runs. Flagstone and larger rocks can be used here, too, in much the same way they appear in a cottage design. The key in this case – and in all other styles, in fact – is to use moderation in developing an approach: Too many rocks in the wrong places will draw visitors' eyes away from plants or other design elements that are more properly emphasized!

what about plants?

Just about any plant will work in combination with rocks, pebbles and stones, but there are certain pairings that offer more interesting design possibilities than others. Let me explain what I mean by suggesting some settings and then filling them with plants.

> Just about any plant will work in combination with rocks, pebbles and stones, but there are certain pairings that offer more interesting design possibilities than others.

Boulders on borders. Try a strappy-leafed plant behind a boulder, such as Agapanthus, Clivia or one of the larger grasses, such as Miscanthus, Cortaderia (Pampas grass), or Pennisetum. Just make sure the plant and the rock are on the same scale: A small boulder with big grass behind it will get lost, while Agapanthus behind a large boulder will be entirely overshadowed.

Continued on page 20

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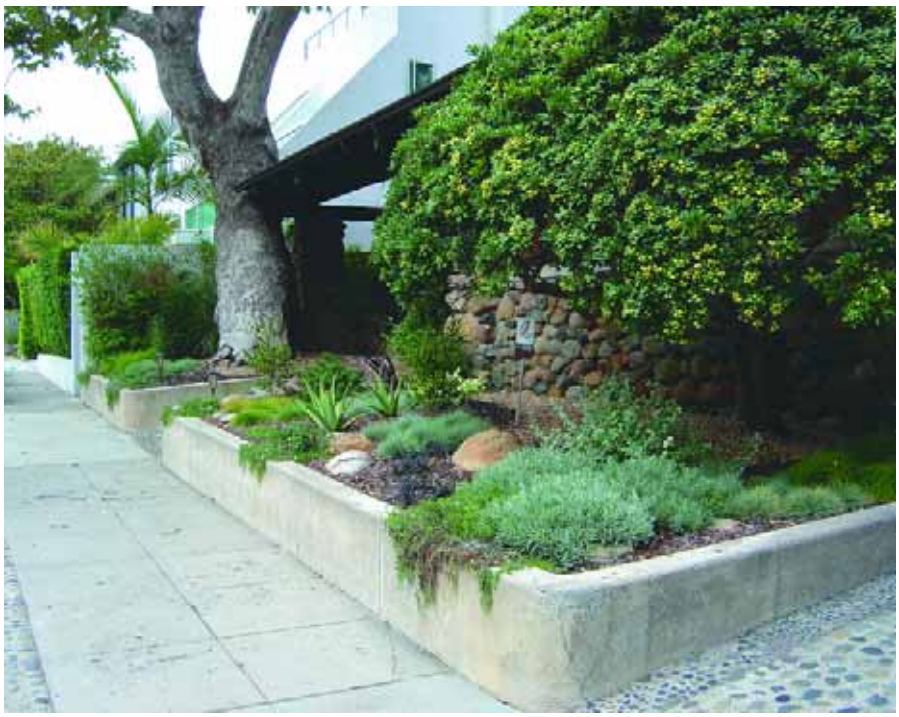
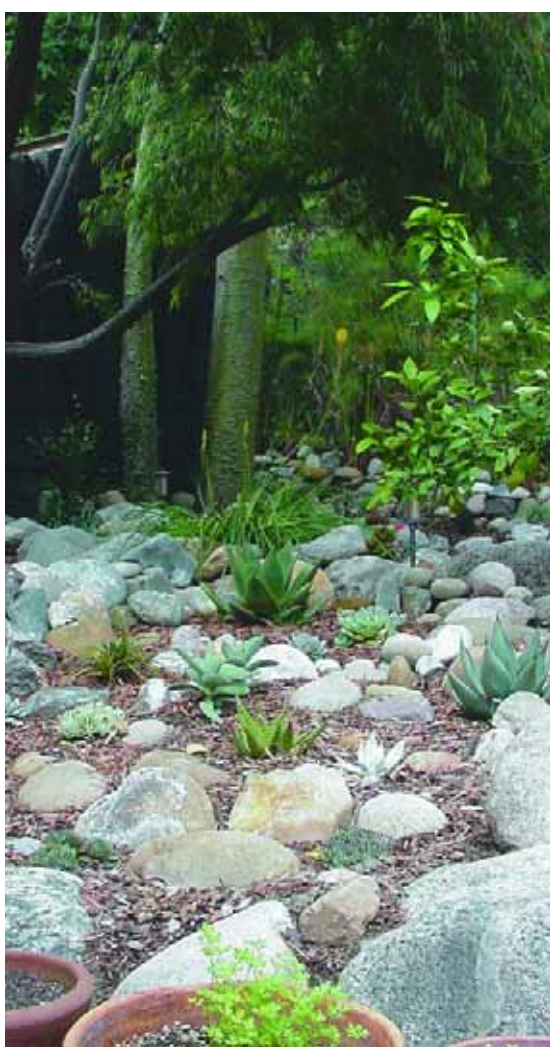


In this Asian-style landscape, the rocks in the wall and planter set off plant forms as well as the exposed-aggregate details below.

Rocks "flow" beneath the bridge to suggest a streambed in another Asian-style garden, this one with a distinctly Japanese flavor.



This rock garden features a variety of carefully placed rocks interspersed with succulents that complement rather than compete with the stones.

s Flagstone pathways. If you're not using gravel to surround your flagstone, a durable groundcover will do nicely. Of course, maintaining the plants will take considerable watering, which might be an issue if your client is concerned about the stones being slippery when wet.

If water isn't an issue, try Baby Tears (Soleirolia soleirolii) or Ophiopogon 'Dwarf Kyoto' (Dwarf Mondo Grass) in shaded areas, or Blue Star Creeper, Sagina subulata (Irish or Scotch Moss) or Zoysia tenuifolia in the sun. Sod is also a good choice for sunny spots and has the advantage of being low maintenance: It's easy for a gardener to run a lawnmower right over both the sod and flagstone while tending to the rest of the lawn.

Placing a tree in the middle of a rock garden is fine as long as the branches of the tree don't block an observer's overall appreciation of the rock garden (assuming that's the main focus of the design).

s Gravel planter beds. You have a variety of options here, no matter whether your planter beds have geometric shapes or an organic appearance. In these cases, however, I tend to shy away from plants that get woody or rangy, as they're completely exposed and become less and less attractive with time.

Instead, I opt for cactus and succulents – *great* rock garden plants – as well as junipers and many dwarf specimens. I also like to use the more upright grasses, such as Juncus, Festuca, and Baumea. Acer palmatum (Japanese maple) also works extremely well when surrounded by a gravel base.

s Rock gardens. As the name implies, these are gardens composed primarily of rocks, with plants used to add visual interest and a break from the baseline

colors and textures. Here, I like to use Echeverias, Sempervivums, Dudleyas and other succulents. I have also used Kniphofia (Red Hot Poker) surrounded by rocks.

The focal point in this type of design should, of course, be the rocks and the ways they are collected and arranged. As a result, plants should be of modest scale (relative to the rocks) or, if they're larger, should not be placed in ways that obscure views of the rocks.

Placing a tree in the middle of a rock garden is fine, for example, as long as the branches of the tree don't block an observer's overall appreciation of the rock garden (assuming that's the main focus of the design). Rock selection is also of obvious importance in these gardens, with a premium on specimens of varying shapes, sizes and even color.

give it a try

These are just some of the situations in which using rocks makes sense in garden design – and I haven't even gotten into the ways these materials can be used to make visual transitions from landscapes to watershapes.

Don't hesitate to dig in: It's as simple as planning for a few strategically placed boulders in a garden you're designing and experimenting with plants around them. And if you apply a "less is more" attitude, it will be all that much easier to maintain the all-important balance between the architecture and landscape style you're using with the rocks you incorporate. WS

Stephanie Rose runs Stephanie Rose Landscape Design in Encino, Calif. A specialist in residential garden design, her projects often include collaboration with custom pool builders. If you have a specific question about landscaping (or simply want to exchange ideas), e-mail her at sroseld@earthlink.net. She also can be seen in episodes of "The Surprise Gardener," airing Tuesday evenings on HGTV.

By David Tisherman

Island Building

The key to all of this **heavy-duty construction** was the forming work we did in **preparation** for the **gunite shoot**. We went to **great lengths** to brace and stabilize the **forms**, all of which were **above grade** and set in the midst of **diamond-hard** shale.

The project I've been working on in the hills outside Hanover, Pa., has just about every feature, bell and whistle one can imagine.

That inclusiveness of detail at every level has translated into an unusually intricate construction process, as I mentioned last time in discussing the excavation, forming, plumbing and steel phases. Now we get to the gunite.

Where a garden-variety backyard pool involves placement of maybe 30 to 50 yards of concrete and some larger projects may run in the 50-to-70-yard range (and where most of mine tend to fall in the 90-to-130 yard range) – this project needed two gunite rigs shooting for two solid days, 12 to 13 hours each day. The pool shell alone (excluding the waterfall, the grotto and several other features we'll get into later) required a staggering 300 yards of concrete. That's about 600 tons of gunite, or 1,200,000 pounds!

Those numbers may not be all that impressive for a commercial pool specialist, but in the realm of residential construction, this is one monster of a pool!

Staging the shoot was extremely complex, and once again I credit my partner Kevin Fleming for his supervision of the gunite crews and the other subtrades that were on hand. The key to it all was setting up the island spa – which is where we get down to details.

inside, outside

The concept of the spa island had to do with creating a special space separated from the "mainland" by a seven-foot bridge. The thought was that this would be a great vantage point for the homeowners to supervise their grandchildren at play in the adjacent pool – and a perfect spot for a thermal ledge with an umbrella holder.

On one side, the island is separated from the deck area by that just-mentioned thermal ledge. It's just six inches deep, and as I've discussed in previous columns, thermal ledges provide wonderful play areas for kids of all ages. We envisioned adults sitting in the spa (or perhaps on the deck under an umbrella or awning) while watching kids play in the six inches of water. Beyond the edge are steps that lead down into the pool, which is 4-1/2- to 5-1/2-feet deep in the areas near the ledge. (See the sidebar on page 27 for more on pool depths.)

In construction terms, the complexity came by virtue of the fact that we had to form and shoot the inside of the spa, with its steps, contours and details, and then somehow also shoot the rest of the island surrounding it. How do you do both things at the same time? The answer is, you can't – you need to sort things out and separate the challenge into two phases.

We had formed the spa just as we would most any other, with a set of forms on the outside – in this case with everything elevated between six and 12 feet above grade. The spa is approximately 8 feet in diameter on the inside and about 10 feet across on the outside of the structure.

Once the rigs started shooting the gunite, we

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shot the entire spa structure solid with the main pool shell. Given the elevation, this meant that the floor under the spa is about 3-1/2-feet thick, thoroughly reinforced with #3 rebars on 12-inch centers in three ways.

In anticipation of phase two of the spa-island shoot, we had doweled dozens of pieces of rebar that penetrated the circular outside forms for the spa. These bars stuck out in all directions. Once the inside was shot, which happened during the initial two-day gunite phase, we let things set up, then went back and stripped all the forms from the spa's interior and exterior surfaces.

We'd used tempered Masonite to line the forms, so they literally popped off the new gunite. This detail was especially helpful in stripping the outside of the spa where the rebar extended out from the forms.

There's a lot of concrete in the structure of this pool shell – 600 tons of gunite in all. The framing we set up with so much care held up beautifully under the accumulated weight and pressure, giving us precisely the complex configurations we were after.

The spa and the island that surrounds it may look monolithic, but they were actually shot in two stages. We formed, shot and stripped the elevated spa, then set up the steel for the island and thermal ledge before bringing back the gunite rig.

At this point, our steel subcontractor came back out and tied a new steel armature all the way around the outside of the spa to create the island, which is about 12 to 15 feet across.

We stubbed out several four-inch sleeves to accommodate the planters that will surround the spa – one sleeve for the low-voltage lighting, another for irrigation and, most important, several to allow for drainage from the planters to avoid the problem of rain over-saturating the planters and killing the plants. Some of the planters will be in an area near the spa surrounded by boulders; this is where we'll be locating the spa-side controls.

held tight

Now we brought back one of the gunite rigs and shot the rest of the island right up against the original spa structure, essentially using the spa's exterior surface as the form.

Through the years, I've heard it said time and again that you shouldn't shoot gunite up against gunite, but the fact is that you *can* shoot right up against it with no problems at all.

In this case, the spa structure offered a beautiful form for the new gunite. We used lots of steel to reinforce and secure the added tonnage of gunite and know that, at ten tons and tied directly into the shell, the spa itself won't be going anywhere. Now we have a massive, "monolithic" island with a finely contoured spa permanently sunk in the middle of the whole affair.

It bears mentioning again that the key to all of this heavy-duty construction was the forming work we did in preparation for the shoot. As mentioned last time, we went to great lengths to brace and stabilize the forms, all of which were above

grade and set in the midst of diamond-hard shale. Despite the fact we had just a few anchoring points, the system of cross beams and kickers let us establish a rigid structure.

For all the effort that went into setting up the forms, we were obviously concerned about how it would hold up once the gunite started to flow. I'm happy to report that the forms didn't move at all – not even a fraction of an inch – during the two-day shoot. I shudder to think what might have occurred if we'd taken a less-rigorous approach.

Lots of the work I've seen in the Northeast has been less than exemplary when it comes to forming – rebar stakes and pegboard forms with minimal bracing, for example. When you shoot up against that kind of "bracing" and later strip the forms, most often you'll find that the pegboard has moved and created huge voids that expose the

There's much more to come on this project, including a huge waterfall that will flow through the recess in the retaining walls and grottos that will require the application of many more tons of concrete to an already massive watershape.

steel. Some contractors have told me that it's "perfectly acceptable" to pile earth against the exposed rebar to fill the void, but all this really does is speed oxidation of the rebar and lead rapidly to structural failure.

The forms on this big Pennsylvanian project, by contrast, were set up well and didn't budge an inch, and they were so elaborate that it took us three days to strip them away after the shoot. Yes, it costs more money to do things this way, but a quick look at the photos shows that this was a *very* clean shoot.

Whenever I tackle a project of this size and complexity, I know going in – and at every step of the process from excavation to gunite – that there is no room for guesswork or the lazy attitude that says, "Close enough." Everything that's gone into this project has been engineered in great detail. Yes, it's more expensive this way, but I rest easy at night knowing that *nothing* has been left to chance. WS

Next: We return to Los Angeles and the restoration project we stepped away from as we awaited delivery of tile from Italy.

***David Tisherman** is the principal in two design/construction firms: David Tisherman's Visuals of Manhattan Beach, Calif., and Liquid Design of Cherry Hill, N.J. He is also co-founder and principal instructor for Genesis 3, A Design Group, which offers education aimed at top-of-the-line performance in aquatic design and construction.*

Not So Deep

Some people have expressed surprise that I would design a pool of the magnitude described in the accompanying article with water depths ranging from 3-1/2 to 5-1/2 feet.

First of all, the pool is meant primarily for kids and entertaining and for free and safe movement in the water. It's also for games such as basketball or volleyball and for other activities supported by shallow water.

So why not create a separate deep end somewhere? Simply stated, this was not a priority for the homeowners and we had no good reason to go any deeper. There's also the fact that shallow water is more energy efficient (especially in a place like Pennsylvania) and that there's value in keeping the overall water volume down relative to the surface area of the pool when heating is a necessity.

To be sure, there are applications where deep water is essential, if for no other reason than it's what the client wants. Absent some specific reason to go deep, however, I'll opt for shallow water every time.

– D.T.

Natural Transitions

By Clayton Varick

The home sat above the shoreline of Seattle's Mercer Island like a modern, angular beacon. The challenge, says watershape designer/builder Clayton Varick, was to weave the residence more successfully into its lakeside surroundings – a mission accomplished by setting up a string of pools, streams, waterfalls, ponds and plantings that effectively create transitions from the starkly geometrical to the breathtakingly natural.

Finding ways to blend the angular rhythms of modern architecture with the sweeping splendors of nature constitutes one of the more difficult challenges faced by today's watershapers.

In the case of the project pictured on these pages, we were contacted in 2002 about an enormous, modern-style home on Mercer Island overlooking the shore of Lake Washington, right near Seattle. The property was being remodeled, and the owners wanted a set of watershapes that would enhance the beauty of the two-acre estate while more convincingly integrating the geometry of the structure with its woodsy lakefront setting.

The solution: a set of watershapes that start near the house with perfect geometric forms that stick to the architect's original design, then moves down the hillside through various transitional stages to a pond feature that looks like part of the natural landscape.

Coming Together

Philosophically, we were all quickly on the same page, but as we began approaching the work and the job site, we recognized a couple of problems.

First, there was no real access by road, a major issue given the heavy equipment and large amounts of material we needed to bring on site to get the job done. Before long, the island setting suggested the solution: We loaded everything onto a 50-foot barge and transported by water to the shore at the foot of the job site.

Second, there was the weather. Much of our work was planned for execution during the Seattle area's long rainy season, which led to difficult scheduling and steady coordinating with a general contractor who was working very hard to keep the project on track and on time.

Logistics aside, we were challenged more profoundly by the fact that the client and renovation team were looking for something truly spectacular in our work to replace an existing waterfeature on the slope leading to the lake – a waterfeature that everyone agreed had been an eyesore in concrete and rock.

We had our marching orders, and it was time to get started. We began by demolishing the old waterfeature, carting away everything but a handful of nice-looking boulders we decided to keep and setting up the blank canvas onto which we were to paint a careful composition of multiple features in vastly different styles.

As seen in the accompanying images, the appearance of these watershapes couldn't be more varied from top to bottom. But amazingly, when you move from one space to the next in a progression either up or down the slope, there's a certain logic to the experience that makes everything seem to fit.

One more challenge to mention: For the most part, our work at Land Expressions is purely naturalistic. Projects such as this one teach us that those sensibilities can exist in harmony with the more precisely controlled aesthetics of geometric architecture – an exciting lesson to learn.

Up on Top

The hillside offered us dramatic vertical transitions and a clear path to follow with respect to the visual movement of the watershapes, but it all starts with a topmost reflecting pool that is modern, geometric and static.

This six-foot equilateral triangle of highly reflective water rises on a dramatic concrete turret set adjacent to a deck and a long set of stairs that leads to the lower sections of the site. The triangle contrasts with (but leads the eye to) distant views while fitting perfectly within the context of the home's architecture and beginning the process of integration by engaging the observer with views of the lake beyond.

The walls for this watershape had been poured by the general contractor before we came aboard with the project and were six inches thick. Had we been on hand, we would have directed the contractor to pour the walls at four inches to accommodate the thickness of our liner-and-concrete finish. As it turns out, we created a step detail to maintain the aesthetics of the six-inch wall – and in so doing added a detail that accentuates the triangular form.

Pouring Down

We rigged the triangular turret with a 40-mil PVC liner using a special gasket-and-track assembly with a neoprene seal before applying gunite and troweling the material to a smooth finish. The vessel itself is about six feet deep, but the majority of that space is filled with a dark basalt riprap that raises the visual bottom of the pool to a mere 12 inches.

An overflow line runs from the water level to a point about halfway down the height of the feature and a penetration on the outside of the turret. This line sends a small flow of water into a diminutive catch basin at the foot of the structure.

Limestone decking is cantilevered over the edge of the catch basin, which is filled with the same basalt riprap as the reflecting pool. A small pump set beneath the layer of rock collects the water and sends it back to the top of the structure. The waterfeature operates independently with respect to water circulation, but it is tied visually to downstream features by way of a dry streambed that runs toward another architectural watershape in the courtyard adjacent to the home's front door.

Architectural Drama

The dry streambed terminates at the top of a 12-foot retaining wall. Just below that point on the other side of the wall, a scupper spills water into what became known as the courtyard feature.

Also in the shape of a triangle, the small catch basin complements and contrasts the upper feature in that it is recessed beneath cantilevered stone decking and nestled against the foot of the retaining wall. A shallow, eight-inch-wide runnel filled with dark riprap stones extends from the shallow pond and appears to flow beneath a set of steps next to the front door. (Again, the scupper and catch basin operate as an isolated system.)

The Key Transition

The runnel leads the viewer's eye to a patio adjacent to the front door that surrounds a small, rectangular pond perched atop another tall retaining wall. The decking material cantilevers over the water, in which large pieces of cut basalt create a dramatic scupper that spills over an 18-inch weir at a rate of about 50 gallons per minute.

As with the uppermost triangle feature, the geometric waterfeature leads the viewer's eyes toward Lake Washington and the forests that hug its shores.

The architect and homeowner were keenly interested in maintaining a minimum amount of freeboard between the pond's water level and that of the decking. By calculating the desired flow over the weir and using valves to adjust the return flow into the feature, we were able to create what is very close to a knife-edge waterline at deck level.

Shifting into Natural

From the weir on down, the tone of the watershape shifts significantly as the water flows into the headwaters area of a stream, waterfall and pond system that leads to the lakeshore.

The waterfront is about 150 feet across, and the house sits upslope from the water by about 40 yards. Within this space, we created a watershape system that is tied visually to the architectural watershapes above by scupper effect at the weir and the dominant use of basalt rock.

But as the observer moves down a set of steps to this lower level, modernity and hard angles are left behind, replaced by a separate environment of vigorous, moving water, lush plantings and bold, rugged stones. It's the perfect transition to the lake itself – the site's ultimate watershape.

Water flows at only 50 gpm across the basalt weir, and a discharge pipe located beneath that cascade supplements the flow to about 350 gpm. The stream flows through an area of thick vegetation (highlighted by a beautiful red maple specimen) and over a set of small falls on its way to the main cascade, which drops 15 feet to a level area before flowing beneath a 12-foot wooden bridge.

Getting Things Done

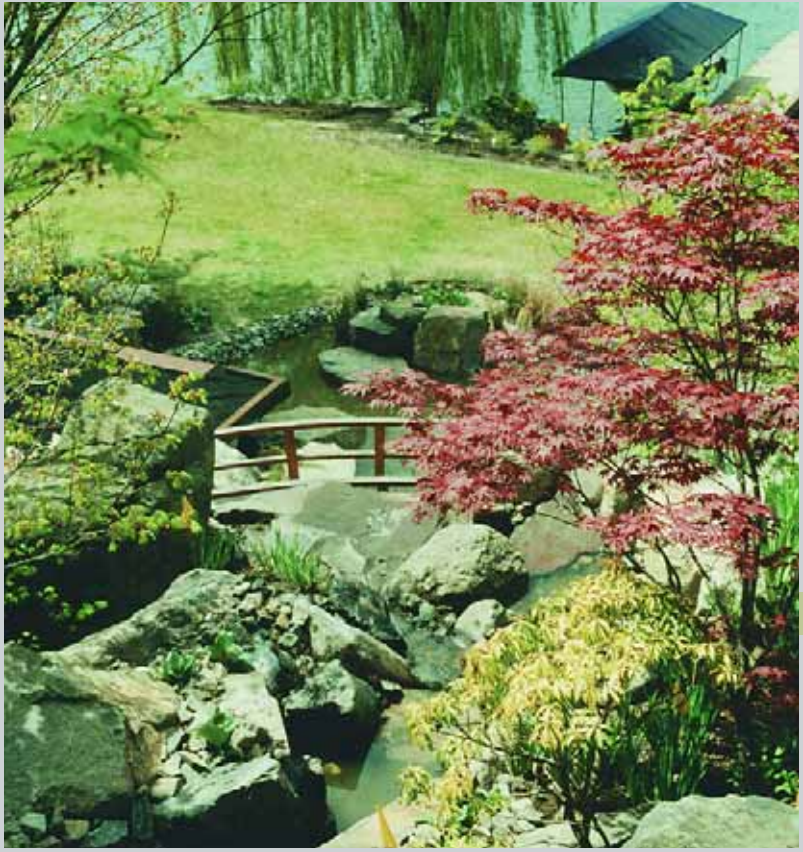
As mentioned in the accompanying text, access and the weather were big factors in how we approached the tasks at hand on this hillside project – and both put a premium on coordination and teamwork.

I worked side by side with the landscape architect Bruce Hinkley in planning and installing all systems needed to whip the slope into shape. We established the plumbing runs and grade transitions between the slope area and the new stream and managed transitions in ways that looked natural. To a large extent, that meant fashioning rock formations that worked visually with the retaining walls at the top of the feature.

Typically, with boulders of the size and quantity we used on this project, we'd crane material into place. But we couldn't bring a crane on site, so we ended up shuttling rock up the slope using a track hoe after we'd lined the space with an EPDM liner and laid down a layer of concrete.

We would then track our way back down the hill, placing rocks on top of the lined concrete and essentially creating a rock wall that transitioned into the pond area. When we reached the bottom of one stripe, we'd move laterally to the next area and restart the process up on top. The pond area at the base of the falls was flat. All we did was excavate it, lay down the liner and flash on a coat of gunite before moving across the hill, stripe after stripe.

– C.V.



Down to the Lake

From the calm area beneath the bridge, the stream continues down another set of small cascades into a 25-by-15-foot pond in which the flow terminates about six feet above the water level of the lake.

We used a 40-mil PVC liner in the pond and worked very hard to leave no liner or concrete exposed to inquisitive eyes. The boulders are set on concrete and have been back-mortared into place. We also went to great lengths to backfill spaces behind and around the rocks with soil suitable for plantings, especially on the hillside transitions where we wanted to establish key pockets of greenery.

The wooden bridge is part of a path that traverses the rocky slope above the shore. The path provides access to multiple deck and seating areas that bring the observer into close proximity with the cascading water.

Senses

Water moving in all sorts of different directions (but always in controlled ways) is a hallmark of one our favorite designers, architect David Tardiff.

We've built the watershapes for many of his projects, and we've particularly enjoyed those that put both his vigor and special subtlety on display. Time and again, his designs have challenged us technically while rewarding our clients with results that always seem to leave them proud, amazed and thoroughly satisfied.

As we've discussed in our previous *WaterShapes* articles, a large part of our business is about executing watershapes for architects and landscape architects in the backyards of mostly affluent clients in southern California's Orange County. Each designer has his or her own creative style and sensibility, leaving us to adapt the work we do to their "idea sets" while lending our years of practical experience in engineering and construction to the process.

In working this way, we find that everyone comes out a winner: The designer creates work that is based in reality; we stretch and expand our skills to realize truly spectacular design concepts; and most important, clients gain refined spaces that hit the mark with respect to both functionality and aesthetics.

The two projects we'll visit on these pages are quite distinct from one another, but Tardiff's creative flair is clearly evident in both. It's our privilege to share in the delight experienced by his clients, and we're always excited when a new project by this brilliant designer begins to take shape.

# of Direction

By Martha & Randy Beard

Martha and Randy Beard have achieved watershaping success by executing sophisticated design programs for a variety of high-end architects and landscape architects in southern California. Here's another in their series of articles about these collaborations – in this case a look at their recent work with architect David Tardiff, a cutting-edge designer of homes and spaces for affluent customers who demand beauty and excitement in their surroundings.

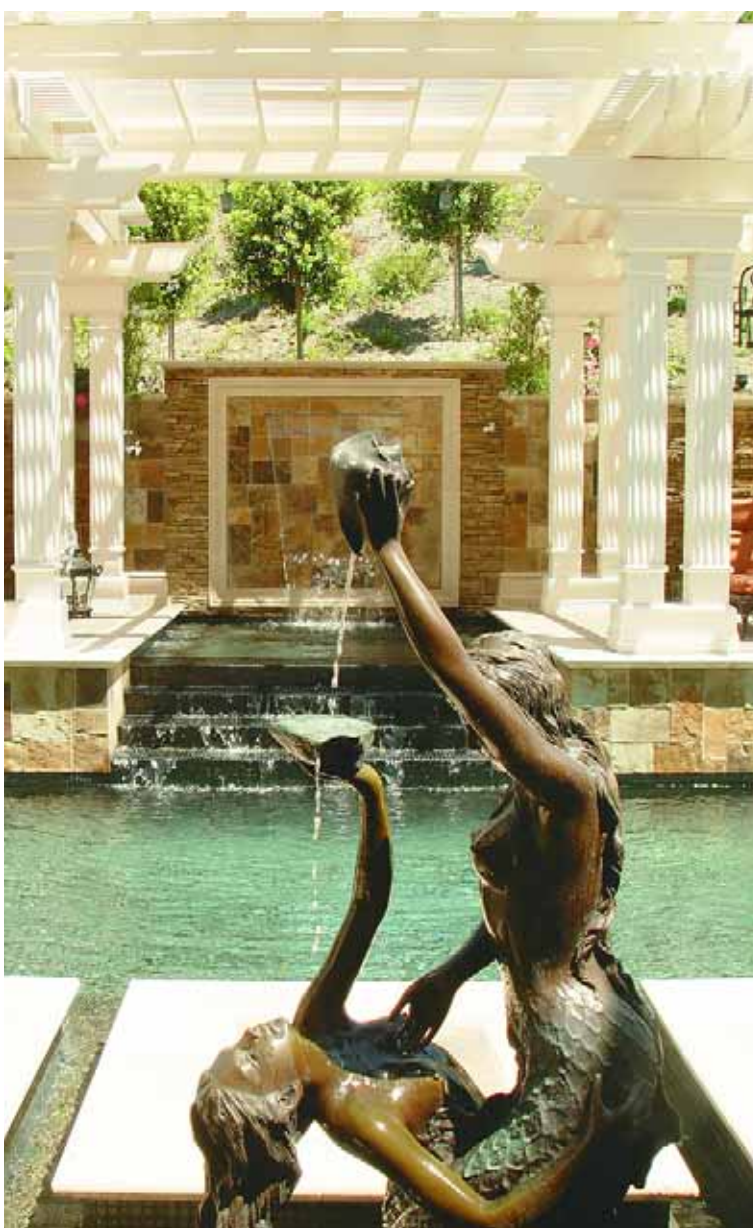
Multiplicities

The homeowner proudly counts off the 17 different ways water goes up and down on his watershape as he guides visitors around the yard. It is indeed quite a scene, a composition of space and motion that leaves guests with much to consider and experience.

For starters, there are waterfeatures that flow downward in what you might call the usual way: One five-foot cascade spills from a raised wall behind the spa, flowing into the spa and pushing the water from that vessel down a set of tiled stairs into the pool. There are two additional waterwalls on either side of the cascade that send gentle trickles over uneven rock surfaces, easing the flows into troughs below.

Six other features push water upwards: three bubbler fountains in a trough on the left side of the wall cascade, and three more bubblers in a trough on the right. This confluence of motion creates a dramatic view from the living room's window, through which one sees water dropping or drizzling down and also shooting up at different heights – quite a dramatic show.

Finally, another set of features shoots water *horizontally* via a series of jets on the raised pool wall. These sprays – adapted from deck-jet fountain nozzles for this application – fan straight out onto the pool surface through decorative sconces.



The effect is one of thin sheets of water washing across the pool's surface in small waves.

As you walk around the watershape and partake of the rich variety of its sounds and motions, it becomes clear that the designer also has a special understanding and appreciation of the interactions of water and the rich set of finish materials he and the clients have selected. The pool and spa interiors, for instance, have pebble surfaces in hues of black and blue that effectively darken the sides and bottom and make everything below the waterline vanish – even the entry steps – and leave observers to guess at the depth of the pool.

Overall, the impression is one of constant activity across and atop deep and inviting expanses of water – a feeling of life and action touched by great tranquility. In this case, Tardiff also breaks the traditional boundaries of the watershape, including "step-overs" in the flat decks that carry small flows of water and provide dramatic access to the pool's steps.

The architect also enjoys the interplay of texture and color, as seen here with the rough flagstone of the raised walls and how it works with the dusty colors of the hills surrounding the home. The coping is simple poured-in-place concrete in the same cream colors as the flat deck and the classic pergola (the mass of which is mediated by the neutral coloring).

In contrast, the waterlines of the pool and spa as well as the stair waterfeatures are inlaid with one-inch pewter Tessera glass tiles that shimmer in purples and blues. Tardiff forces the eye to focus on the dissimilarities and how they react with each other amid all the neutral colors and smooth textures.

The clients were after a backyard that would be a theatrical space, the stage for a drama of light, motion and sound – and Tardiff certainly succeeded in giving them what they envisioned.

Practicalities

Touches such as the step-over troughs described in the accompanying text are meant to please discerning clients, but if they aren't set up with functionality and serviceability in mind, they are likely to become irritating to their owners before much time passes.

This is where our background in pool service comes into play, as we're *always* conscious of the importance of building a pool with maintenance as a key consideration. In the case of the small in-deck troughs, for example, we knew well enough to plumb numerous return lines so the runnels would have adequate circulation from end to end.

This particular client also wanted to be able to turn each feature on individually or operate them in custom combinations. Although everything here is part of one body of water, this desire meant that we had to set up separate plumbing systems for each and every effect – not to mention install two of Jandy's Aqualink control units, a remote unit and nine transformers to handle the pool, the spa, all landscape and pool/spa lighting, gate operations, the outdoor bar area and more.

One particularly unusual feature of this project was the wiring and hanging of a large crystal chandelier from the center of the patio cover just over the spa.

– M. & R.B.

Potentialities

David Tardiff's design work is far from monolithic. Where theatricality might be the order of the day for one set of clients, he responds to other clinets in other ways – as is the case in the next project we'll explore, where his work is all about sport and filling the yard with play areas and toys for children of all ages.

In doing so, he starts from formal points of departure, including pergolas and their wonderful columns, as well as an elegant approach from the house to the pool area via grand entrance steps that encircle the raised spa and carry visitors to the elevated level of the backyard.

The spa area is formal as well, with water flowing into a step-over trough that pours directly into the pool. The step-over not only softens the look of the spa but also separates the barbecue area from the fireplace patio and clearly defines boundaries for various functions within the yard. The barbecue and fireplace patios are shaded by the pergolas, with beautiful potted vines climbing the columns and draping flowers across the fretwork overhead.

The watershape, however, is all about *play*.

In building it, for example, we used faux rock to create a dark, hidden grotto that sits behind a raucous cascade from an overhead rock that splashes into a small ravine. We also built a *second* grotto in stark contrast to the first: Each has a flat sitting area, but where the first is noisy and active, the second is round and sunny and the water does no more than trickle from hollowed rocks next to it.

In addition to these hiding places, we also set up a waterslide with access steps tucked behind the rockwork where they stay invisible. The 22-foot slide twists and turns and finally pushes the children through a wall of water that surges from the top rocks.

Here, as in his other projects, Tardiff uses the watershape's rocks, deck stones and interior finish to create focal points of color and texture. In this case, all elements are in the same color range – grays and soft greens and earth tones spread across a large canvas. The rocks are rounded and curved, mimicking the contours of the round spa and the curved lines of the poured-in-place coping and steps. The flat stone on the deck is rough-hewn and uneven but framed by the curves of the pool, spa and steps.

Each area of the yard – the watershapes, the decks and landscape areas – is perceived in sequence as the eye follows the curves from the entrance up to the rockwork and the side patios. Each space has its designated, distinct function, yet all of them are linked through Tardiff's careful selection of colors and textures into a cohesive, living painting.

Once again, it was a program that called for multiple plumbing systems, massive boosters and complex control units that governed everything from the waterfalls and slides to the lighting for the yard's miniature golf course. In this case, the architect wanted to be sure the water was always playful, always inviting, always in motion – a constant presence that travels as nature and gravity dictate before rippling across the edgy surface of the pool.

Protect and Serve

Natural stone is certainly beautiful, says watershaper Paul Benedetti, but *sustaining* that beauty often means taking steps in the installation process to ensure easy maintenance and enduring protection of the stone's exposed surfaces. Here, in the first of a series on enhancing the appearance and durability of hardscape materials found around watershapes, he takes a look at the family of chemicals designed to seal in the splendor of stone.

By Paul Benedetti

Few materials used in the watershaping world match the beauty, durability or luxuriousness of natural stone. It provides a rich and varied palette through a seemingly endless variety of species available from around the world, and the most common types – including granite, marble, limestone and slate – have been and are being used in a seemingly endless array of settings and applications.

Stone is so widely used and so tough a material that it's easy to think that it will last forever without change. The fact is, however, that stone will keep its good looks for the long haul only if it has been properly installed and maintained.

Stone's tale of enduring beauty begins when the contractor takes steps to protect it from water's damaging effects, including stains, scale and corrosion; from the wear it will receive as a result of foot traffic, plant life and even natural erosion; and from spills that are sure to occur in recreational settings.

Ultimately, what natural stone surfaces need is a measure of contractor and homeowner awareness of the nature of the material and establishment of a proper set of cleaning practices. Even more important, these surfaces require the application of a quality sealer coat with initial installation. That's why at our firm we've spent a tremendous amount of time and effort figuring out the fine points of stone sealers: Based on our experience, it's clear that despite the added costs and labor involved in using these products, the payoff is well worth the initial investment.

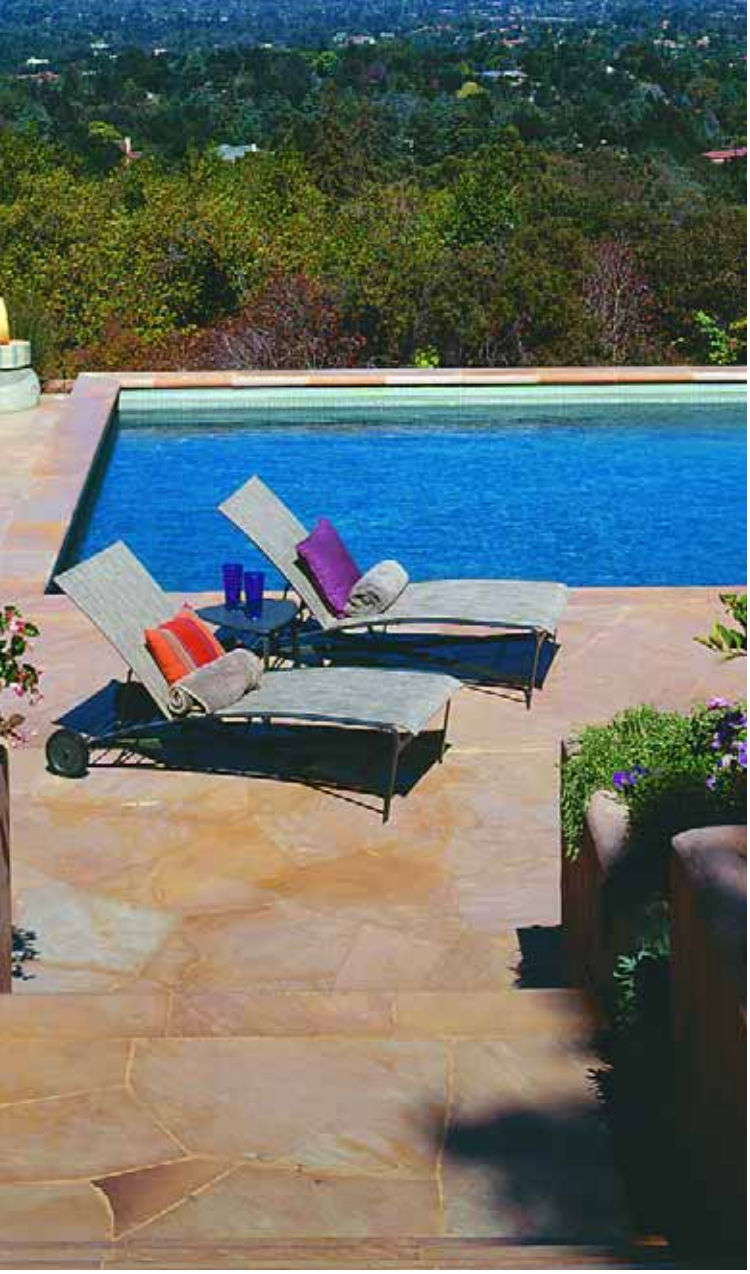
Porous Natures

The need for sealers is driven by the nature of stone itself: Although most types appear hard and impervious, many are actually quite porous and, left unprotected, are susceptible to freeze damage, staining and decay.

By filling the pores and tiny fissures in stone, sealing provides a number of benefits including stain resistance, easier maintenance, inhibition of moss and mildew growth and protection of the stone during the grouting process.

Without question, there's value in the way sealers establish a barrier that prevents the penetration of spills and dirt in swimming pool areas, not to mention spills of red wine, barbecue sauce, food and greasy materials that can thoroughly mar the appearance of expensive stone.

And believe me, clients are more than a bit disappointed when they learn that the spilled glass of merlot will leave behind an enduring reminder of the accident by disfiguring an oth-



erwise beautiful limestone surface, for example. If a sealer had been used and properly maintained, that same errant splash of the grape would have meant no more than an easy clean up.

In the same way water beads up on the hood of a well-waxed automobile, so, too, water and spills will puddle or pool on sealed stone and will not be able to find their way into the microscopic voids that cover the surface of the stone. And let's not single out red wine unfairly: The same benefits arise when splash out, suntan lotion, tree sap and fertilizers come in contact with sealed stone.

And where the stone itself clearly benefits, one of the best services performed by sealers has to do with grout and mortar and the way the sealers thwart mold, mildew and other unsightly blemishes to which both grout and mortar are particularly subject. In commercial settings, there's a further benefit in that well-applied sealers can aid in the removal of graffiti and reduce the damage it can do.

Finally – and much more tangibly for contractors – there's the assist sealers give you during the construction process. Sealing the stonework prior to grouting, for starters, helps protect the stone from the pigments in colored grout, the staining effects of gray mortar and intrusions by colored concrete. Pre-sealing also makes removing construction-related splashes and spills easy and assists in cleaning up after the grouting process.

That's why, in my company, we seal all stonework and copings before grouting and then seal the grout as soon as it's completely cured: It just makes sense.

Why It Works

Sealer chemistry is tremendously complex, and I won't even pretend to completely understand the fine points. I do know, however, that on a basic level sealers form a barrier that acts as a releasing agent.

That seems simple enough, but the fact is that there are many types of sealers on the market and each of them works or purports to work in its own special way. As a rule, however, these products fall into three basic categories: penetrating sealers, surface films, and admixtures added to cementitious materials such as gunite, mortar and grouts. We'll be discussing the sealing of cementitious materials in another article in this series; for now, we'll limit discussion to stone surfaces and to the penetrating and surface sealers. Both penetrating and surface sealers use either a solvent or water as a base. The active ingredients are suspended in solutions of water or the solvent, both of which evaporate and leave the active ingredients behind to cure in or on the stone.

Recent air-quality regulations have strictly limited the application of solvent-based products, because the evaporated materials are pollutants and significant contributors to smoggy skies. As a result, most manufacturers have shifted to water-based systems that are not only environmentally friendly but also offer much easier cleanup as well as superb performance.

Solvent-based sealers were once the mainstay of the market, despite the fact that they were a little harder to apply.

Outside Assistance

It's long been my contention that watershapers generally do well to reach out and consider a full spectrum of options when it comes to products such as the stone sealers discussed in the accompanying feature as well as concrete admixtures, waterproofing agents, chemical stains and a host of other options.

In our own work, for example, we've ended up turning to a set of stone-sealing products we've never seen on the floors at pool- or landscape-industry trade shows or in most of the trade magazines.

We've found the journals of the concrete industry to be particularly helpful, along with information from the Portland Cement Association. Events such as the World of Concrete trade show and other construction-oriented expositions have also opened our eyes to a wide range of products we now apply in our work as watershapers.

– P.B.

But now that suppliers have worked the kinks out of water-based sealers and these products do just as good a job as their solvent-based equivalents, solvent-based sealers have taken a back seat and will probably be phased out of existence before long – despite the numerous contractors who still swear by them.

Sealers are further classified in terms of aesthetics, again as three groups. There are natural-look products that have been designed not to change the appearance of the stone. There are color-enhancing agents that typically darken and enrich the color of the stone. And there are surface sealers that usually come in matte/semi-gloss or glossy. (Without special additives, the surface sealers tend to make surfaces slippery when wet. They *can* be used around watershapes, but only when pedestrian safety is carefully considered.)

Inside Scoop

So what's inside these penetrating and surface sealers that lets them do their jobs? Again, there are a couple of approaches and product types with which contractors should familiarize themselves:

w **Silicone-based sealers.** Many of the products marketed as "stain-repellent" sealers use silicone. In our experience and despite their well-earned reputation as stain repellents, however, silicone-based products aren't as effective as they need to be as stone sealers. For starters, they're not particularly good at resisting the oily stains that come from any number of sources around a watershape, including motor oil, salad dressings, marinades, barbecue sauces, animal fats and suntan lotions.

w **Teflon-based sealers.** Among penetrating sealers, those containing Teflon or other similar agents (silanes, siloxanes, epoxies, acrylic silicates and fluorosilicates) are quite effective. They all penetrate the pores of the stone and fill its capillaries. Some of these sealers also provide a molecular charge that resists staining at the molecular level.

w **Selective sealers.** Some sealers, while penetrating the stone, do not *completely* seal the pores. Instead, their molecular structures are sized to block the penetration of stains but to allow for the transmission of smaller water molecules. This approach works in some climatic zones, but it's a real disadvantage in areas that experience freeze/thaw cycles where these sealers may allow destructive water to enter the stonework.

w **Surface-film sealers.** The slippery-when-wet surface-film sealers are particularly well suited to vertical watershape surfaces made of porous, flamed, chiseled, hammered

Means to Clean

The cleaning products used with stonework fall into categories, just as do the sealers. In this case, there are two classes of products – the *cleaners* designed for routine maintenance and the *strippers* designed to remove the finish and give you a fresh start with the stone.

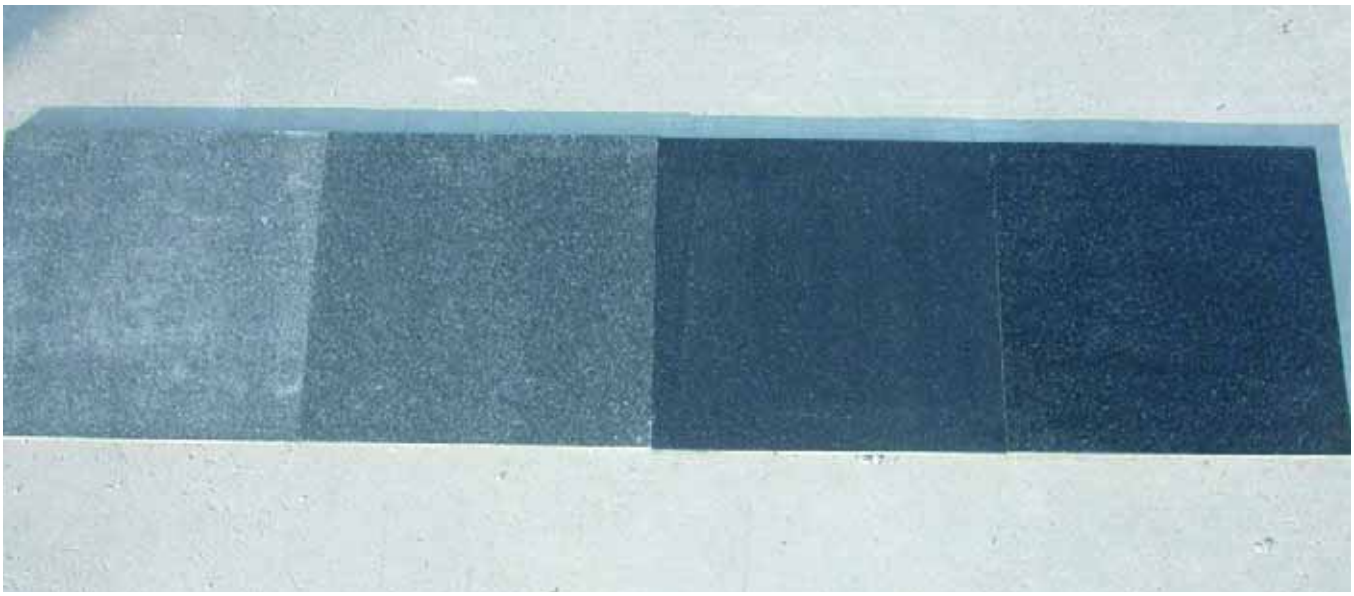
• Whenever possible, it's best to use a cleaner from the same manufacturer as the sealer that has been applied, basically to avoid problems with incompatibility. Indeed, we've found that the cleaners from one supplier act like strippers when used with another's sealers – and to make matters worse, it's sometimes hard to tell that you've compromised the finish!

Compatibility is the key here, and you also need to make certain your clients know the score by providing them with the MSDS for any sealers used on a project along with notes on which sealers were used where.

• Strippers remove the sealer or weaken its chemical bond in preparation for stonework resealing. They should be used after a cleaning product that effectively removes surface dirt and prevents its migration into the stone once you attack the sealer with the stripper.

At all times, avoid the use of household cleaners on stonework, sealed or not! The compounds found in these products may stain, darken or weaken the stone or sealer, and it's always best to work with products that have been designed and tested specifically for use with stonework.

– P.B.



The various available sealers make their marks in a variety of ways to suit a range of needs. From left to right, you see the stone unsealed, then with a natural-look penetrating sealer, then with a matte surface sealer and, finally, with a glossy surface sealer. Each look has its own merits depending on the setting – and your design intentions.

or textured stone. In glossy formulations, they create the impression that the surface is wet even when it may be dry. But this may work against the designer's best interests at times – as when these areas are lit at night, where a glossy surface will exhibit a blinding glare.

w **Color-enhancing sealers.** Sealers designed to build the color of stone are hybrids in that they penetrate the stone's surface but also leave a microscopically thin film on the surface. The surface layer is designed to reflect light in a manner that causes the stone to look darker or deeper in color. The stone will be slightly slippery as a result, but at nowhere near the level found with gloss sealers.

Application Science

Through the years, we've picked up a few techniques in working with stone sealers that always stand us in good stead with sealer suppliers, our clients and the stonework itself.

The first rule we apply is an obvious one: We always perform a test on a sample of stone or, if none is handy, find an inconspicuous spot to conduct a test. The second rule is less obvious: Before applying any sealer to an entire project, we make absolutely certain the client is happy with the look of the sealed sample or test stone.

We're also sticklers about surface preparation: Most sealers are applied with lamb's wool applicators, sponges or towels to surfaces that must be clean, dry and dirt- and dust-free. If this means pressure-washing the area, letting it dry for a few days then blowing it clean with a leaf blower, so be it, because cutting corners here is asking for trouble. Indeed, residual dust, dirt or moisture can cause clouding, prevent penetration, cause spotty protection or even prevent bonding and penetration.

We also follow manufacturer directions when it comes to application of additional coats. Second applications are usually applied within 24 hours, but it's important to know that some product labeling calls for immediate second applications while others require gaps of several days between coats.

In general, the more porous the stone, the more coats will be required to gain desired levels of protection. Granites, marbles, slates and dense limestones usually require two coats, while porous stones such as flagstone or soft limestones may need four or even five coats.

Most of the procedures outlined above are dictated by common sense and by fol-

Service Life

Many manufacturers are now offering "lifetime" sealers that come with 10- or 20-year performance guarantees. Trouble is, most of them haven't been around that long, so who's to say?

Manufacturers base such claims on "accelerated testing" in which samples are subjected to extreme conditions that foreshorten the timeline. These tests subject surfaces to salt-spray baths, heat lamps and deep freezes, for instance, and some involve injecting or introducing substances under pressure. Samples are then examined under a microscope to determine degrees of penetration.

Even with all of this technology, no sealer should be *completely* trusted in the field for more than two years. We recommend checking areas with high foot traffic, for example, and then stripping and resealing as needed. Areas subject to freeze/thaw cycles may require inspections even more frequently, as sealer failure in these cases may lead quickly to cracked or spalled stonework.

– P.B.

lowing directions, but there's one key path we follow that isn't on the books: We've found that it is best to seal any completed stonework as projects progress rather than waiting until everything is done and can be treated all at once.

This practice has helped us avoid major catastrophes through the years, all because we've taken the time to sponge on a sealer right away. On one recent project, for example, a coupling on a cement-pump hose came undone during a pour. About a wheelbarrow load of colored concrete ended up being pumped onto a patch of beautiful, field-cut flagstone decking.

Everyone panicked at the time, but the flagstone cleaned up nicely with water and a push broom, leaving no indication of the coupling blowout. Similarly, oversprayed plaster or plaster accidentally troweled onto colored grout simply sponges off.

Read the Fine Print

Beyond anything we've learned in the field, there's one simple, final rule that must be followed: In everything we do with stone sealers of any type, we follow the manufacturer's recommendations.

These directions are particularly useful in deciding which products to use on which stone. Surface sealers, for example, are designed to seal the stone by leaving a film on its surface, which means the product's ability to bond to the surface of the stone is the key factor in successful use of the sealer.

In plain black and white, for example, most surface-sealer manufacturers will advise against applying their products to polished stone because the sealer will have trouble bonding to the surface and will begin to flake, peel or cloud as the film delaminates from the polished stone.

But there are also products that bend the rules. There are glossy sealers, for instance, that make stone slip-proof. And there are penetrating sealers that enhance surface appearance, surface sealers that are invisible and other products designed to work against prevailing tendencies of products in the same categories. The only way to pick up this information is to read the labels, ask questions of your suppliers and open your mind to all sorts of possibilities that may or may not be expected based on product type.

But first things first: Rather than read every label every time you need a sealer, it's best to start by determining what you hope to achieve with the sealer. Is it there simply to protect the stone from stains and water, or is it to add depth or richness as well as protection? Do you want the sealer to add an appearance of wetness, or is it all about protecting completed work from subsequent stages of construction? Or maybe what you really want is some assistance in retarding efflorescence?

Once you know what you're after, you can dig into the labeling with a sense of direction and accelerate the selection process. It's also important to know that most sealer manufacturers will give you free samples from their product lines to let you perform your own tests. We've always taken advantage of this service, and I'd say that through the years I've tested products from more than a dozen suppliers, sometimes applying them side-by-side in comparison tests.

Learning Curves

To be sure, it takes time and experience to get a feel for what's available among sealers – a process that isn't helped by the fact that new products emerge all the time with all-new sets of performance claims that need to be tested.

Be that as it may, we've settled on a few manufacturers and seldom look much further because we're satisfied by the technical support they offer as well as by ready product availability and ease of application. But to reach that point, we've had to strip sealers, replace stonework and polish out granite – and we know most of the time that the mistakes occurred because someone did not follow directions.

I can see how this happens, because many of the materials we work with as watershapers allow us degrees of latitude in application of which we take full advantage. But with sealers, it's amazing how important things like applying the material to clean, dry surfaces or keeping the material out of direct sunlight or applying it in proper temperature ranges can be.

We've also learned through experience that cost is not the driving force. We use an inexpensive spray-on penetrating sealer for concrete and grout, for example, to lend density to the surface and stop water migration and efflorescence, while we use an extremely expensive waterproofing admixture for grouts and mortars and other cementitious materials.

There's no way around doing your homework. If you take the time to find out what works for you in your specific projects with particular types of stone in particular applications, you'll find stone sealers that stand the test of time while adding considerable value to your projects. And isn't it the goal of every watershaper to have stonework looking as good 20 years from now as it did the day it was installed?

Resources:

A variety of suppliers offer stone sealers. Here's a short list of sources that have proved reliable in helping us find the best sealers for a variety of stone applications in our watershape settings.

Custom Building Products
www.custombuildingproducts.com
(800) 272-8786

System Dynamics Inc.
(800) 844-8514

White Mountain
www.tricoat.com/whmnt/whitemoutain-products.htm
(510) 614-2360

Glaze 'n' Seal Products
www.bedrosians.com/gns-spec.htm
(800) 486-1414

Stone Care International
www.stonecare.com
(800) 839-1654

Mapei
www.mapei.com/indexAmericas.htm
(800) 42-MAPEI

Laticrete International
www.laticrete.com
(800) 243-4788

Miracle Sealants
www.miraclesealants.com/sealers.html
(800) 350-1901

– P.B.

When it comes to listing the most extensive, ambitious uses of water in recreational settings, the resort property known as Atlantis, Paradise Island, Bahamas, should quickly come to mind. With its multiple swimming pools, waterslides, fountains and huge marine exhibits, the project took six years to complete, says the resort's aquatic sciences vice president Steve Kaiser, and is a magical experience for anyone who admires creative watershaping.

The resort opened in 1994 with completion of Phase I of a program that emerged once developer and entrepreneur Sol Kerzner bought the property from Merv Griffin in 1992. Phase II saw another round of construction that was opened to the public in 1998 – and ever since, Atlantis, Paradise Island, Bahamas, has been known worldwide as a prime vacation spot for couples and families.

The original pre-1992 property consisted of three buildings that had been built about 30 years previously along with one swimming pool and 27 tennis courts. Today, the facility occupies about 70% of Paradise Island's 826 acres on the northern edge of Nassau and is the unabashed expression of Kerzner's desire for a dynamic, water-infused environment inspired by its tropical setting and the legendary lost continent of Atlantis.

As a result, the property is rich with elaborate rockwork, ponds, waterfalls, pathways, lush plantings and themed attractions, not to mention eight million gallons of marine habitats, a beach-entry pool, two children's pools, cascade pools joined by waterslides, a four-lane lap pool, two free-form pools, a lazy river ride, a seven-acre snorkeling lagoon and more than 40 waterfalls and fountains.

Simply touring these watershapes takes an entire day. There is literally something for every taste – and more than enough to occupy guests' leisure time for days on end.

Design by Phases

There's no mistaking the fact that Atlantis is all about its watershapes, and that each one, no matter what kind, was deliberately designed to make an architectural statement.

This was easy with swimming pools and fountains, which have long been used as decorative or themed design features in architectural settings, but it was a concept that had never effectively been applied in designing marine exhibits. What we saw in examining the world's great aquariums were austere designs that borrowed any sense of beauty from the marine life they contained.

Welcome to Paradise

By Steve Kaiser

At each step of the design process, we kept coming back to this driving thought that everything had to flow from our initial tropical/mythological inspiration. We also talked constantly about how important the water elements were to the impressions we wanted to make: Take away the watershapes and this might still be a beautiful resort – but it wouldn't have anywhere near the same levels of character and interest.

Of course, all those watershapes cost quite a bit, especially given the scale and scope of the property. But when you consider that the resort draws so well largely because of its water, then you see in a dramatic way how the watershapes were investments in the success of the property and have proved to be worth every penny spent. The fact of the matter is that the property now sells itself – and that, by the way, the water takes your breath away.

Phase I of our work on the property encompassed the original buildings and added viewing areas for what is known as "Predator Reef" and another, smaller exhibit known as "Seagrapes Lagoon," which houses a variety of fish. We also added a set of ponds and waterfalls.

In all, this phase incorporated three million gallons of water into the facility – just in the exhibits. We also developed the beach-entry lagoon pool and dotted the property with ten additional swimming pools.

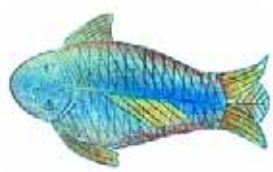
Architecturally speaking, the concept was to create naturalistic spaces rivaled only by Mother Nature. Rock & Waterscapes of Irvine, Calif., did the artfully artificial rockwork, using latex molds of formations and caves found on nearby Providence Island.

A Temple in the Sun

Construction in Phase II began in 1996 and represented an even more deliberately themed approach than we'd used in the first phase: This, in fact, is where we began to develop the full notion that guests were joining us in discovering part of the lost continent of Atlantis.

We added new waterpark elements and several more marine exhibits, the most important of which in thematic terms is the area known as "The Dig" – a huge, indoor area that simulates an archeological excavation and provides viewing access to a number of marine exhibits including the two million gallons of "The Ruins Lagoon," one of the largest marine exhibit structures in the world.

This phase also saw development of the "Mayan Temple" structure, which includes five waterslides in all – two of which move right through a marine exhibit. Our original idea was to use crocodiles to lend excitement to these two slides, but Sol Kerzner had worked with a crocodile exhibit in Sun City, South Africa, and knew from experience that there were a number of complications with these animals that made



The property is rich with elaborate rockwork, ponds, waterfalls, pathways, lush plantings and themed attractions, not to mention eight million gallons of marine habitats, a beach-entry pool, two children's pools, cascade pools joined by waterslides, a four-lane lap pool, two free-form pools, a lazy river ride, a seven-acre snorkeling lagoon and more than 40 waterfalls and fountains.

Both of the Mayan Temple slides that move through the shark tank give adventure-seekers a special thrill, but the more leisurely passage of the rafts on the Serpent Slide probably make for better viewing of the wildlife.

such exhibits extremely costly to build and prohibitively difficult to maintain.

This line of conversations ultimately led to the "Leap of Faith" slide, in which you actually slide down a tube and move through a tank filled with sharks. This notion of combining waterpark elements with marine exhibits came from thinking well outside the box – an approach evident throughout the temple structure, which has served the property as something of an icon ever since its completion.

The fact that the structure sends visitors sliding through a shark tank makes it special, but we also like its operational and cost efficiency in that we ended up building a single slide-and-step structure to house five slides instead of setting up five separate structures.

As we saw it, the problem with most waterparks is that you end up with a bunch of steel supports and steps that are there for all to see. In design terms, most of these slide structures are in pyramidal shapes, so it seemed natural to use a "real" pyramid as the structure.

Better yet, the Mayan imagery worked into our overall Atlantis theme, based on the notion that Atlantean culture, as legend has it, touched many of the ancient cultures of the world. Originally, we'd planned a more eclectic structure with Mayan, Aztec and Pacific Rim motifs to reflect the full extent of that conjectured reach, but we soon decided to

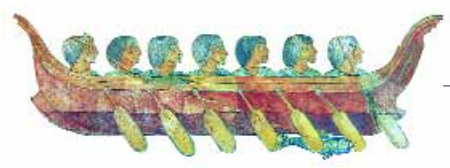
The Legend of Atlantis

The Greek philosopher Plato was the first to write about the lost civilization of Atlantis.

He told of a vast island empire that stretched from the Straits of Gibraltar at the mouth of the Mediterranean and far out to sea in the Atlantic Ocean. Dating as far back as 10,000 B.C., it was said to have been a utopian society rich in technology and innovation – but was utterly destroyed and submerged by a massive earthquake sometime around 1,500 B.C.

Although Atlantis is the stuff of legend, that hasn't prevented those devoted to the myth to hunt for evidence of the lost continent – even some scientists to go along with the writers, poets and romantics who have long sought its remains. Some even claim to have found traces of the lost empire in places as far-flung as the island of Crete, the Canary Islands, Scandinavia and various other spots in the Western Hemisphere.

– S.K.



stick with a purely Mayan design to avoid confusion and capitalize on the familiarity of the stepped-pyramid shape.

Slippery Slopes

The temple structure includes five slides in all.

The "Leap of Faith" slide is a real rush: a 60-foot drop down the face of the pyramid then through the tube leading to the shark tank at speeds up to 30 miles an hour. About 50 feet of the ride passes through the shark-infested waters in a tube suspended six feet or so above the bottom of the tank. The tube is extremely buoyant, which meant we had to fabricate three columns that come up from the floor of the tank to hold the tube steady in the water.

The second slide that passes through the shark tank is an open-air, inner-tube slide. This is a much slower ride that starts out in a winding dark tunnel that turns and twists through the pyramid structure before dropping into a square acrylic structure that stretches 90 feet through the center of the shark tank.

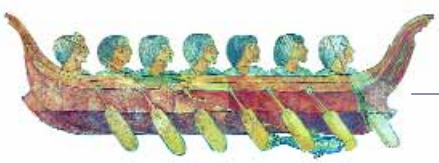
This slower ride is much better when it comes to viewing the sharks: On the speed slide, most people are going so fast that they don't think to open their eyes the first two or three times they take the ride. By contrast, the inner-tube slide gives you a longer, more relaxing ride that enables you to have a good look at our collection of Pacific Black-Tipped, Caribbean Reef, Silky, Blacknose and Nurse sharks.

The shark tank itself holds about a half million gallons of water. It's 21 feet deep (our deepest vessel), has an L-shape and is basically 90 feet long and 45 feet wide.

There are three other slides: The "Jungle Slide" winds through lush vegetation, and, on the backside of the pyramid, you'll find the "Challenger" slides – side-by-side drops with dramatic humps and turns and timing lights that let you race with the person next to you.

These three slides discharge into splash pools that lead to smaller slides that drop into the large, free-form, beach-entry pool. This is a high-activity area with lots and lots of deck space around that 120-foot pool. Near that complex is a small

The Dig area is a major component in the resort's mythological theme and gives visitors a chance to view underwater ruins, ancient hieroglyphs, an Atlantean submarine and diving suits along with abundant marine life.



kiddie pool with its own slide.

One of the things parents like most about the facility and its slides is that they tend to keep kids busy all day, going up lots of steps and coming down in a hurry. We don't know if it's a record, but one young man kept count and used the slides about 60 times a day – a wearying level of activity that makes for early bedtimes and sound sleeping.

We also have a more formal pool called the "Royal Bath." This rectangle has radiuses at each end, checks in at about 240,000 gallons and was originally conceived as a more adult area, although we've observed that kids end up using that pool as well. It has a beautiful, glass tile sun emblem set into its floor.

Saltwater Havens

For all of the excitement generated by the slides, the pools and their surrounding landscape/hardscape areas, the resort's multiple marine exhibits rival the recreational facilities in popularity.

In all, there are 11 habitats that contain eight million gallons of water, more than 200 species of fish (no mammals) and a population of 60,000 animals, including piranhas, barracudas, rays, eels, turtles, sharks and host of smaller (but amazingly colorful) tropical fish.

As mentioned above, the "Predator Reef" and "Seagrapes Lagoon" were part of Phase I. Phase II added "The Ruins Lagoon," which is visible from "The Dig" complex, as well as "Shark Lagoon," "Turtle Lagoon," "Stingray Lagoon," "Beach Falls Lagoon" and more.

Some of these watershapes are designed strictly to be seen from above and therefore lack underwater viewing areas. We provided access to these tanks via walkways and seating areas, and some lagoons are best taken in from balconies of rooms in the towers, where seeing the silhouettes of stingrays, shark rays or sharks in the water can be breathtaking.

As mentioned above, we drew a very fine line between developing these watershapes as marine exhibits and using them to make architectural and thematic statements. Throughout Phase II,

Visitors don't need to get wet to observe marine exhibits. Various reefs and lagoons and tanks have pathways or bridges that allow close-up views – and the predator tunnel offers views of sharks that challenge the squeamish.

The resort's watershapes also encourage direct participation in myriad recreational opportunities, from a soak in a huge spa or a ride on a lazy river to simple swimming in a variety of locations around the property.

We keep signage and explanatory displays to an absolute minimum, instead relying on interpreters and guides equipped with a great deal of information about the fish. Our goal, quite simply, has been to create informative spaces that didn't feel like museums.

everything has consciously been made to look as though you're moving through parts of a lost city or engaged in an archeological dig – and given both the island and subterranean themes, the fact that you're surrounded at all times by marine animals helps bring everything together.

This is a different approach from most aquariums, where the habitats are more about moving large numbers of people through viewing areas with lots of signage. By contrast, we keep signage and explanatory displays to an absolute minimum, instead relying on interpreters and guides equipped with a great deal of information about the fish. Our goal, quite simply, has been to create informative spaces that didn't feel like museums.

We even went so far as to create hieroglyphs that are meant to represent the language of Atlantis, with "The Dig" being the most elaborate of these areas. It consists of interconnected tunnels, passageways, boulevards and chambers that provide viewing areas for various marine exhibits. There are also imaginative displays (such as a clock that might have been used in Atlantis) as well as shrines, Atlantean diving suits, a submarine, statuary, frescos, columns, stonework and a host of other highly detailed displays.

The theming extends right into the tanks, with lots of visual links between the dry spaces and the underwater exhibits. There are ruins that span wet and dry spaces, for instance, and lots of examples of sunken Atlantean technology. In one spot, we even have what appears to be the wreckage of a flying machine that crashed into the ocean and has sunk to the bottom.

In-House Control

For all the fun and fascination to be found at Atlantis, maintaining the marine exhibits and the swimming pools is serious business.

The marine exhibits department includes 60 full-time employees, has two specimen-collection ships, operates a fully equipped marine-animal hospital and runs a kitchen that provides food for the animals. It's an operation that rivals the world's best marine aquariums.

For the marine exhibits, we're constantly replacing a portion of the water to help maintain water quality. All the rest is filtered using Stark high-rate sand filters made by Paragon Aquatics (LaGrangeville, N.Y.). Just for the marine exhibits, there are 32 5-foot-wide, 14-foot-long tanks filtering some three million gallons each hour in an equipment room that looks like a major fluid-processing plant.

We use a combined ozone/bromine system to maintain the 11 swimming pools and all of the slides and have found that this tandem approach makes for wonderfully polished water. We use ozone alone in the saltwater exhibits, and we've observed that there's enough naturally occurring bromine in the water for the same synergy to operate – thus giving us great water clarity in these tanks as well.

To stay on top of everything, we have a water laboratory in which we constantly test water in all watershapes for a range of chemical factors seven days a week, with a full range of specific tests performed each morning and afternoon. We're watchful when it comes to ozone and bromine levels in the marine exhibits, and we also monitor basic factors such as water balance and total dissolved solids. In addition, we run a full complement of biological tests to forestall outbreaks of any diseases.

The kitchen serves up all sorts of shrimp, squid and other sorts of expensive "sashimi" to the fish. There's an elevator system that lets us discreetly transport hundreds of pounds of food each day from ground level to the exhibit lagoons, and divers are constantly in the water, cleaning and maintaining the tanks.

Size and Quality

When you add it all up, the Atlantis team stands as one of history's most ambitious developers and marketers of large-scale water amenities, and those of us who've played our parts in the process couldn't be prouder of either the scale or quality of what we've accomplished.

None of this would have been possible without the vision and fortitude of Sol Kerzner. In fact, it's fair to say that he has, when it comes to every aspect of the facility's watershapes, insisted not only on achieving immense size and scope, but also on achieving the highest quality when it comes to facilities and programming for Atlantis.

The value of his approach can be seen in the looks of joy and fascination on our guests' faces. There's nothing quite like watching the wonder in a child's eyes as he gazes at the fish or she grins at the end of a ride down the slide. And that same pleasure reaches adults as well.

In a place such as Atlantis, it seems, there's a joy that brings out the child in each of us.

The Design Team

Creating watershapes as ambitious and spectacular as those found at Atlantis, Paradise Island, Bahamas, called on the talents of a wide and varied range of top-flight professionals:

- *Architects:* Wimberly, Allison, Tong & Goo, Newport Beach, Calif.; The Architects Partnership, The Bahamas
- *Planners, landscape architects:* Edward D. Stone & Associates, Ft. Lauderdale, Fla.
- *Structural engineering:* DeSimone, Chaplin & Dobryn, New York
- *Piping, hydraulics:* Cloward Madden & Associates, Provo, Utah.
- *Electrical and mechanical engineers:* Lehr Associates, New York
- *Artificial rockwork:* Rock & Waterscape Systems, Irvine, Calif.
- *Interior Design:* Wilson & Associates, Dallas

– S.K.

Product Information Card

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Please note:
The Advertiser Index in our January 2004 issue carried an incorrect web address for Bronzelite. The company's correct web site listing is www.bronzelite.com

MISSING ANY?

r **February 1999** (Vol. 1, No. 1)
Tisherman on working in difficult soils; **White** on edge treatments; **Lacher** on expansive soils.

n **April 1999** (Vol. 1, No. 2)
Hopkins on designing with large rocks; **Hare** on basic hydraulics; **Straub** on shell curing.

r **June 1999** (Vol. 1, No. 3)
Phillips on water and decks; **Parmelee** & **Schick** on soils and geology; **Anderson** on water sounds.

r **August 1999** (Vol. 1, No. 4)
Anderson on stream design; **Adams** on community waterparks; **Gutai** on spa hydraulics.

r **October 1999** (Vol. 1, No. 5)
Holden on aquatic-design history; **Mitovich** on dry-deck fountains; **Tisherman** on site geometry.

r **December 1999** (Vol. 1, No, 6)
Finley on Japanese gardens; a roundtable on pools and landscape design; **West** on color rendering.

n **January 2000** (Vol. 2, No. 1)
Hart on designing for model homes; **Zaretsky** on retaining walls; **Chapman** on hydrid pool finishes.

r **February 2000** (Vol. 2, No. 2)
Hersman on lighting design; **Macaire** on faux-rock installations; **Andrews** on glass mosaics.

r **March 2000** (Vol. 2, No. 3)
L'Heureux on project management; **Long** on steel cages; **Forni** on installing and maintaining lakes.

r **April/May 2000** (Vol. 2, No. 4)
Schwartz on garden access; **Anderson** on streambeds; **Nantz** on watershapes and architecture.

r **June/July 2000** (Vol, 2, No. 5)
Holden on fountain-design history; **Bibbero** on large stones; **Anderson** on making streams work.

n **August 2000** (Vol. 2, No. 6)
Tisherman on shapes; **Lucas** on watershapes for wildlife; **Ryan** & **Medley** on the vertical axis.

r **September 2000** (Vol. 2, No. 7)
Davitt on designing for small spaces; **Altvater** on the importance of aeration; **Hetzner** on sheet falls.

n **October 2000** (Vol. 2, No. 8)
Lampl on natural design; **Anderson** on finishing streams; **Rubenstein** on kinetic water sculpture.

r **Nov./December 2000** (Vol. 2, No. 9)
Arahuete on John Lautner; **L'Heureux** on stretching laminar flows; **Benedetti** on satellite surveying.

r **January/February 2001** (Vol. 3, No. 1)
Holden on a retro-look design (I); **Fleming** on upscale approaches; **Gutai** on pump technology.

r **March 2001** (Vol. 3, No. 2)
Moneta & **Farley** on site-specific design; **Benedetti** on fiberoptics; **Alperstein** on golf-course water.

r **April 2001** (Vol. 3, No. 3)
Jauregui on inspired clients; **Dirsmith** on frosty fountains; **Tisherman** on deluxe finishing.

r **May 2001** (Vol. 3, No. 4)
Reed on sculpture gardens; **L'Heureux** on sequenced water; **Brandes** on restoring riverfronts.

r **June 2001** (Vol. 3, No. 5)
Winget on fun-inspired waterforms; **Holden** on survey formats; **Schwartz** on classic stonework (I).

r **July/August 2001** (Vol. 3, No. 6)
Rugg on pond basics (I); **Ruthenberg** on perimeter overflow; **Schwartz** on classic stonework (II).

r **September 2001** (Vol. 3, No. 7)
Rugg on pond basics (II); **Urban** on energy savings; **Pasotti** on interactive waterplay.

r **October 2001** (Vol. 3, No. 8)
Tisherman on hilltop views; **Hagen** on natural stream work; **Schwartz** on classic stonework (III).

r **Nov/December 2001** (Vol. 3, No. 9)
Straub on Kansas City's fountains; **McCloskey** on the Getty Center; **Tisherman** on Fallingwater.

r **January 2002** (Vol. 4, No. 1)
Phillips on Hearst Castle's watershapes; **Bower** on the Raleigh Hotel pool; **Roth** on Katsura Rikyu.

r **February 2002** (Vol. 4, No. 2)
Marosz on project integration; **Moneta** on spa-edge details; **Affleck** on sculpture and water.

n **March 2002** (Vol. 4, No. 3)
Holden on a retro-look design (II); **Morris** on wild water; **L'Heureux** on fountain lighting (I).

n **April 2002** (Vol. 4, No. 4)
Oliver on multi-level flows and transitions; **Gutai** on pump basics; **Dews** on hiding headwaters.

r **May 2002** (Vol. 4, No. 5)
Anderson on pond essentials; **Pasotti** on interactive waterplay; **Gibbons** on 'stellar' fiberoptics.

r **June 2002** (Vol. 4, No. 6)
Altorio on civic fountains; **Gutai** on skimmers; **Beard** on working with landscape architects.

n **July/Aug. 2002** (Vol. 4, No. 7)
Holden on retro details; **Dunn** on quality, mid-range pools; **Varick** on grand-scale watershaping.

r **September 2002** (Vol. 4, No. 8)
Rosenberg & Herman on site-sensitive design; **Dirsmith** on long-term design; **Gutai** on filters.

r **October 2002** (Vol. 4, No. 9)
Copley & Wolff on modernizing fountains; **Bethune** on imitating nature; **Tisherman** on edgy colors.

r **Nov/December 2002** (Vol. 4, No. 10)
Holden on Villa d'Este; **Hobbs** on Maya Lin's watershapes; **Phillips** on water in transit.

r **January 2003** (Vol. 5, No. 1)
Fleming on high-end ambitions; **Harris** on decorative interior finishes; **Gutai** on surge tanks.

r **February 2003** (Vol. 5, No. 2)
The **Beards** on collaboration; **Yavis** on custom vinyl-liner pools; **Mitovich** on Microsoft's campus.

r **March 2003** (Vol. 5, No. 3)
Fowler on habitats for marine mammals; **Benedetti** on outdoor kitchens; **Dews** on planting pockets.

r **April 2003** (Vol. 5, No. 4)
Shoplick on watershapes as teaching tools; **Gutai** on water flow; **Schwartz** on Maya rockwork.

r **May 2003** (Vol. 5, No. 5)
Zaretsky on sensory gardens; **Freeman** on hydraulic retrofitting; **Hanson** on water/stone sculpture.

r **June 2003** (Vol. 5, No. 6)
Gunn on fountain whimsy; **Tisherman** on watershaping for an art collector; **Holden** on tile.

r **July 2003** (Vol. 5, No. 7)
Fintel on attracting birds; **Lacher** on structural engineering; **Alperstein** on golf course design.

r **August 2003** (Vol. 5, No. 8)
Miller on site-specific fountains; **Gutai** on plumbing joints; **Holden** on period-sensitive restoration.

r **September 2003** (Vol. 5, No. 9)
Hebdon on borrowing naturalism; **Ruddy** on indoor designs; **So** on modernist sculpture.

r **October 2003** (Vol. 5, No. 10)
Mitovich on dry-deck fountains; **Roth** on liner issues; **Marckx & Fleming** on glass tile.

r **November 2003** (Vol. 5, No. 11)
Holden on carved stone; **Shaw** on roles of con-

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Of Interest

The following information has been provided to WaterShapes by product suppliers. To find out how to contact these companies, look for the Product Information Card located on page 58.

Wireless Remote Control

Circle 135 on Reader Service Card

JANDY has introduced the Wireless AquaLink RS System for complete pool and spa control via a portable, rechargeable, battery-powered desktop unit that will communicate at ranges up to a half mile on a 2.4 GHz radio-frequency signal, even without clear lines of sight. Ideal for retrofits, there is no wiring between the equipment and control panel – and no need for trenching or indoor wiring. **Jandy (Water Pik Technologies)**, Petaluma, CA.

Butterfly Valves

Circle 136 on Reader Service Card

ASAHI/AMERICA introduces its Giant Butterfly Valve. Designed for superior performance, the PDCPD valve is ideal for high-flow applications in waterparks and large-scale waterfeatures and has a molded, lined body with full-seat design for a bubble-tight seal. Available in sizes ranging from 28 to 40 inches, the valve is rated to a maximum working pressure of 110 psi at 175 degrees F. **Asahi/America**, Malden, MA.

Motors for Spas

Circle 137 on Reader Service Card

A.O. SMITH has introduced one- and two-speed PolarBear motors for use in spa applications. Engineered to withstand high temperatures and keep spa pumps running cool, the motors feature fully vented frames and a switch that silently switches from phase to main. The pumps come in 2-, 2-1/2- and 3-hp models, and the two-speed version operates at 3,450 and 1,725 rpm. **A.O. Smith**, Tipp City, OH.

Glass Tile Series

Circle 138 on Reader Service Card

OCEANSIDE GLASSTILE introduces Ritual, a collection of matte-finish glass tiles that extends the line of traditional glass tiles the company produces in gloss, iridescent and metallic finishes. Designed to provide a smooth surface texture while suggesting the depth inherent in translucent glass, the tiles are available as bar liners and in 1-by-1, 1-by-2, 2-by-2, 2-by-4 and 4-by-4 inch sizes in nine colors. **Oceanside Glasstile**, Carlsbad, CA.

Stainless Steel Spas

Circle 139 on Reader Service Card

BRADFORD PRODUCTS offers six models of stainless steel spas for inground or skirted installation. Custom models are also available, and all models can be used with a long list of options, including polished finishes, full ceramic- or glass-tile finishes, railings, fiberoptic lighting, specialty seating and more. All spas are pre-plumbed to stub-outs, and usually only four pipes need to be connected. **Bradford Products**, Wilmington, NC.

Waterplay Systems

Circle 140 on Reader Service Card

EMPEX WATER TOYS manufactures an array of waterplay systems, including the Aquadek T410-1A, which combines slides, spray arches, jets and other play features to offer entertainment to children of all ages in an environment designed for safety. Made with lightweight materials that perform with the strength of steel, system components are available in several colors. **Empex Water Toys**, Uxbridge, Ontario, Canada.

Automatic Pool Cleaner

Circle 141 on Reader Service Card

POLARIS POOL SYSTEMS has introduced its latest generation of automatic pool cleaner with the Polaris 480 PRO. Intended for use with all inground pools, the professional-grade cleaner features four vacuum jets, a large drive jet and a large-capacity intake. Designed for durability, the device offers superior resistance to UV/chemical discoloration and corrosion-resistant components. **Polaris Pool Systems**, Vista, CA.

Ceramic-Coated Aggregate

Circle 142 on Reader Service Card

3M offers Colorquartz ceramic-coated crystals to add color, durability and extended life to the interior finishes of swimming pools. Available in fade-resistant colors that range from the vibrant to the subdued and from the saturated to the lightly tinted, the product starts with hard quartz to which a colored ceramic is bonded. The material stands up to harsh sunlight, pool chemicals and acid washings. **3M Colorquartz**, St. Paul, MN.

Lighted Stepping Stones

Circle 143 on Reader Service Card

GEM-SCAPES offers illuminated Stepping Stones for decoration of garden, landscape, pool and pond pathways. Made from genuine agate, the stones are available in a variety of round and oblong shapes. Illumination mats are placed beneath the agate slices and can either be daisy-chained or lit individually. Smaller gemstones cover the wiring and complete the design. **Gem-Scapes**, Orlando, FL.

Reinforced Fittings

Circle 144 on Reader Service Card

SPEARS MANUFACTURING offers stainless steel-reinforced fittings to reduce problems associated with the over-tightening of female plastic pipe threads in plastic-to-metal joints. More than an added reinforcing ring, the fittings are available in a variety of configurations in sizes from 1/4 to 4 inches and compensate for expansion forces generated within tapered pipe-thread joints. **Spears Manufacturing**, Sylmar, CA.

Sand-Filter Media

Circle 145 on Reader Service Card

ZEOTECH CORP. manufactures Zeobrite as a replacement for regular sand-filter media. Using an all-natural zeolite mineral that removes contaminants and entraps particulates down to 3 microns, the material is designed to provide superior water clarity, lower operating costs and reduced chloramine, odor and eye-irritation levels – all with a reduction of up to 50% of the need for backwashing. **Zeotech Corp.**, Fort Worth, TX.

Pool Drains and Gates

Circle 146 on Reader Service Card

BALCO offers low-profile swimming pool drains and grates for high-level aesthetics on gutter or perimeter-overflow applications. Available in bronze or aluminum with a number of satin or anodized finish options, the drains feature extruded frames, treads and support bars, cast-in anchors and optional stainless steel liners as well as theft-resistant locking devices. Custom radiuses are also available. **Balco**, Wichita, KS.

Retractable-Roof Pool Enclosures

Circle 147 on Reader Service Card

OPENAIRE makes retractable-roof pool enclosures and skylights that extend the pool season for year-round swimming. The motorized panels open up to 50% of the roof area, while the maintenance-free framing system ensures an effective moisture barrier that can withstand harsh pool environments. Freestanding or attached, the enclosures and skylights can span distances up to 100 feet. **OpenAire**, Mississauga, Ontario, Canada.

Automatic Water Filler

Circle 148 on Reader Service Card

PENTAIR POOL PRODUCTS offers the Automatic Water Filler, a device that protects pool equipment using simple yet reliable float mechanisms to monitor and control water levels in pools and spas. Just seven inches in diameter and constructed with rugged ABS polymers, the filler comes in standard and vanishing-edge models and has brass or plastic fill valves and lids that come in four colors. **Pentair Pool Products**, Sanford, NC.

Custom Ceramic Tile

Circle 149 on Reader Service Card

MICHELLE GRIFFOUL STUDIOS offers hand-crafted stoneware and porcelain tiles for decks, walkways, fountains, pools and more. Imbued with warm, rich colors, the tiles are made individually and can be used in mosaics, borders and fields filled with decorative elements ranging from the natural – fish, leaves, fruits or stars – to the unusual – cocktail glasses, coffee cups and abstract forms. **Michelle Griffoul Studios**, Buellton, CA.

Silicone-Filled Wire Connections

Circle 150 on Reader Service Card

KING INNOVATION offers DryConn Waterproof Connectors. Silicone-filled to provide a dry, safe, reliable environment for wire splices exposed to water, condensation, vapors or dust, the connectors are engineered to eliminate pre-twisting, heat shrink, resin packs or multi-piece corrosion kits. UL-listed, the connectors' silicone never hardens, even at extreme temperatures. **King Innovation**, St. Charles, MO.

ATTENTION ALL READERS!

Many of you have asked why you need to fill out subscription cards if no information about your business has changed. Here's why:

We are required by the U.S. Postal Service and the Bureau of Publication Audits to be able to prove, with your signature on a card, that you asked to receive the magazine and that you are a watershaper.

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This is important, so take a minute once each year to complete one of the subscription card we include in every issue of the magazine and mail it to us. Thanks!

WaterShapes

Commercial-Grade Cover Spring

Circle 151 on Reader Service Card

PLASTIMAYD offers a new, commercial-grade spring on its safety covers for pools. Designed to provide almost twice the tension of conventional springs, the devices give safety covers a tighter fit and eliminate the risk of premature spring distortion. They are also lower and more flush with the deck than conventional springs, making the cover more wind resistant for less wear and tear over time. **Plastimayd**, Clackamas, OR.

Fiberglass Pools

Circle 152 on Reader Service Card

FERNO PERFORMANCE POOLS offers fiberglass pools to the fitness-oriented market. The shells are made with 14 layers of fiberglass and feature a vinyl ester resin over the gel coat to prevent blemishes and blistering. The vessels also have reinforcing struts that stiffen the walls and make the pools freestanding – ideal for swim currents or addition of underwater treadmills or bikes. **Ferno Performance Pools**, Wilmington, OH.

Fountains and Statuary

Circle 153 on Reader Service Card

TREVI offers fountains, planters and statuary influenced by classic pieces from ancient cultures. Made using glass-fiber-reinforced concrete that is textured and colored to appear like natural stone, the garden features are long-lasting and substantially lighter than cast stone. All pieces are available in seven colors: desert rose, ancient, garden green, charcoal, dark ancient, terra cotta and sierra. **Trevi,** Las Vegas, NV.

Diamond Wire Saw

Circle 154 on Reader Service Card

SANDERS SAWS offers a new Diamond Wire Saw. The Model DSM-10A saw is ideal for concrete removal and repair and for numerous remodeling, restoration and demolition applications. The saw, which has a total weight of 330 pounds when fully assembled, comes standard with a control system for an electrical-feed system, an electrical connecting cable, a ratchet wrench, and a single-ended spanner. **Sanders Saws**, Honey Brook, PA.

Bronze Lighting Fixtures

Circle 155 on Reader Service Card

CAST LIGHTING makes a range of solid-brass lighting fixtures that are impervious to corrosion, unbreakable and easy to install, adjust and maintain. Low-voltage path, bullet, area, niche, well, tree and deck fixtures are available and use either MR-16, PAR-36 or zenon halogen lamps. Photocells, time clocks, multi-tap transformers, marine-grade wire and a variety of accessories are available. **Cast Lighting**, Hawthorne, NJ.

Paver Restraints

Circle 156 on Reader Service Card

OLY-OLA EDGINGS offers a selection of paver restraints to fit a variety of projects and installation preferences. Made of 100% recycled vinyl, the products feature an L-shaped design that makes the restraints easy to install, either under or outside of the paver, as well as key-hole cuts that make the material flexible and durable. The product comes in four formats to meet varied needs. **Oly-Ola Edgings**, Villa Park, IL.

Dehumidification System

Circle 157 on Reader Service Card

DECTRON offers the Dry-O-Tron DS/DSV Series of light-commercial and residential dehumidifiers for use with indoor pools and spas. Five models feature moisture removal from 1 to 46.2 pounds per hour with 1,000 to 3,800 cfm airflow, and the heat generated in the system can be used to warm the pool water. They also come with optional air-conditioning for year-round comfort control. **Dectron**, Montreal, Quebec, Canada.

Fiberoptic Illuminators

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SUPER VISION offers Lite Pro, a compact, lightweight illuminator for fiberoptic lighting systems. The unit features a 150-watt halogen lamp with a 1,000-hour service life, a fiber capacity of 1,000 strands, dual fans for cooler operation and a kill switch activated when the cover is opened. Standard features include color and sparkle wheels, while options include synchronous and DMX controls. **Super Vision**, Orlando, FL.

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Professional Drawing & Presentation School April 12-18

In Los Angeles this spring, Genesis 3 co-founder and principal instructor David Tisherman will lead an intensive, week long, professional-level course designed to show participants what it really takes to develop top-flight drawing and presentation skills.

Open to a limited number of applicants, the school will cover rendered flat plans in multiple presentation formats, markers, vegetation, surface materials, water effects, elevations, color prespective rendering and much more.

Developed at the request of pool professionals, landscape architects and graduates of Genesis 3's Level I and Level II schools, this dynamic program is based on professional-level drawing courses David Tisherman taught at UCLA for 12 years. Cost (including accommodations, meals and all drawing materials and media) $5,950.

Applications are now being accepted. A $1,500 deposit is required.

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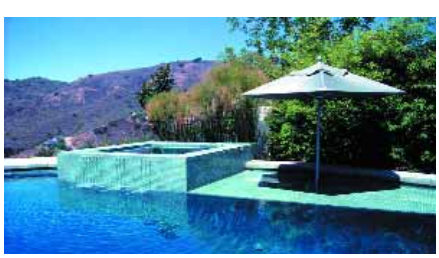
- Participants are encouraged to bring a guest or spouse. Please call for more information and prices.



GENESIS 3 DESIGN GROUP

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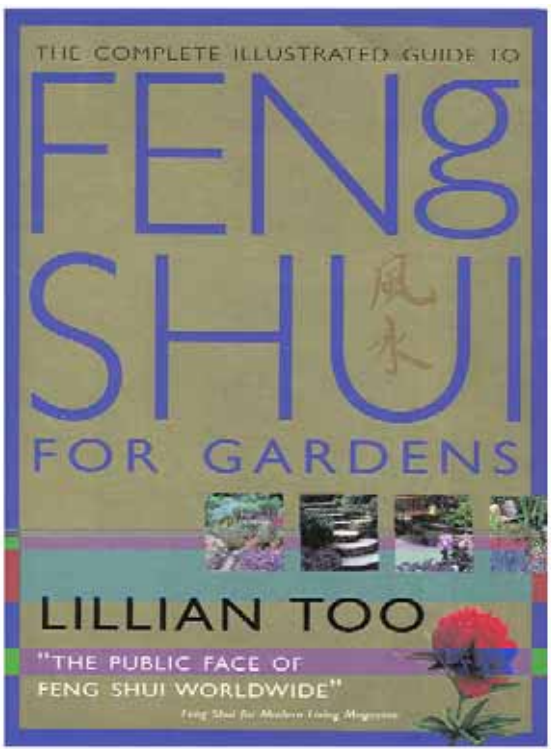
GENESIS 3 - THE INTERNATIONAL FORUM FOR CONTINUING EDUCATION FOR WATERSHAPE DESIGNERS

By Mike Farley

Illustrating Feng Shui



This column must be prefaced with the thought that, for a great many of our clients, perception is reality.

That's something I hold onto whenever I get involved in trying to understand and use *feng shui*, the ancient Chinese method for arranging harmonious, balanced spaces. I am far from a devotee of the art (or science, as some would have it), but I'm aware that some of my clients know a thing or two about it – and that knowing something myself is essential to working with them successfully or at all.

There are literally hundreds of books about *feng shui*. Of the half dozen I've read, none is better suited to the needs of the watershaper than *The Complete Illustrated Guide to Feng Shui for Gardens* by Lillian Too (Element, 1999).

There are a couple of key points that make Too's perspective on *feng shui* so useful: First, she deals exclusively with outdoor spaces, which means you don't have to grind your way through long treatises on architecture or interiors. Second, she's a gifted writer and makes the subject entirely accessible for those of us who are looking for an introduction. The topic is broken down in ways that make sense out of what can be a confusing and decidedly foreign way of looking at design.

There are chapters on using the *feng shui* "compass" and numerology as keys to organizing spaces for balance and harmony. There are concise discussions of how plantings, garden structures, patio spaces, lighting, fire and cooking areas fit into the picture. Best of all for those of us in the watershaping trades, there's an extensive look at the use of water – a section in which Too does us all a huge favor by declaring that water should be used in *every* garden.

For the most part, her treatment of water sticks to fountains, streams and ponds. She discusses the angle at which water should flow in relation to structures and particularly to their doors and windows. She also considers vessel contours, stating a strong preference for curved and freeform shapes as opposed to rectangles and geometric designs. Water depth is another factor that comes into play, along with the importance of organizing points of view from which the watershape will be seen and of proper placement of the watershape in the context of the overall space.

She explains that, in a majority of settings, swimming pools do not present a favorable profile for gardens because water is extremely powerful in the world of *feng shui* and because their large size tends to throw settings out of balance. In most applications, she says, water should be used sparingly and on modest scales lest it reflect energy in potent and uncontrolled ways.

Through all of these discussions, she goes to great lengths to explain how water and other garden elements can and should be used to create positive "chi" or energy. As an example, she discourages combining water and fire: They are opposite elements and tend to cancel out each other.

The beautifully illustrated 220-page text puts truly refined spaces on display and is at times quite inspiring. For those of us who might see *feng shui* as exotic and incomprehensible, Too uses these projects to break everything down in ways that really do impart a basic working knowledge of the subject, even though, as she points out, truly mastering *feng shui* takes years – a useful caution to those who might be inclined to get ahead of themselves after reading a book or two or six.

You certainly won't come away from Too's great little book as an expert, but you can step away as a novice with a working knowledge of *feng shui* principles that will stand you in good stead with clients who care deeply about the values and ideas embodied in this ancient discipline.

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

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