Inside: Brian Van Bower on AutoCAD

WaterShapes

Design • Engineering • Construction

Volume 6
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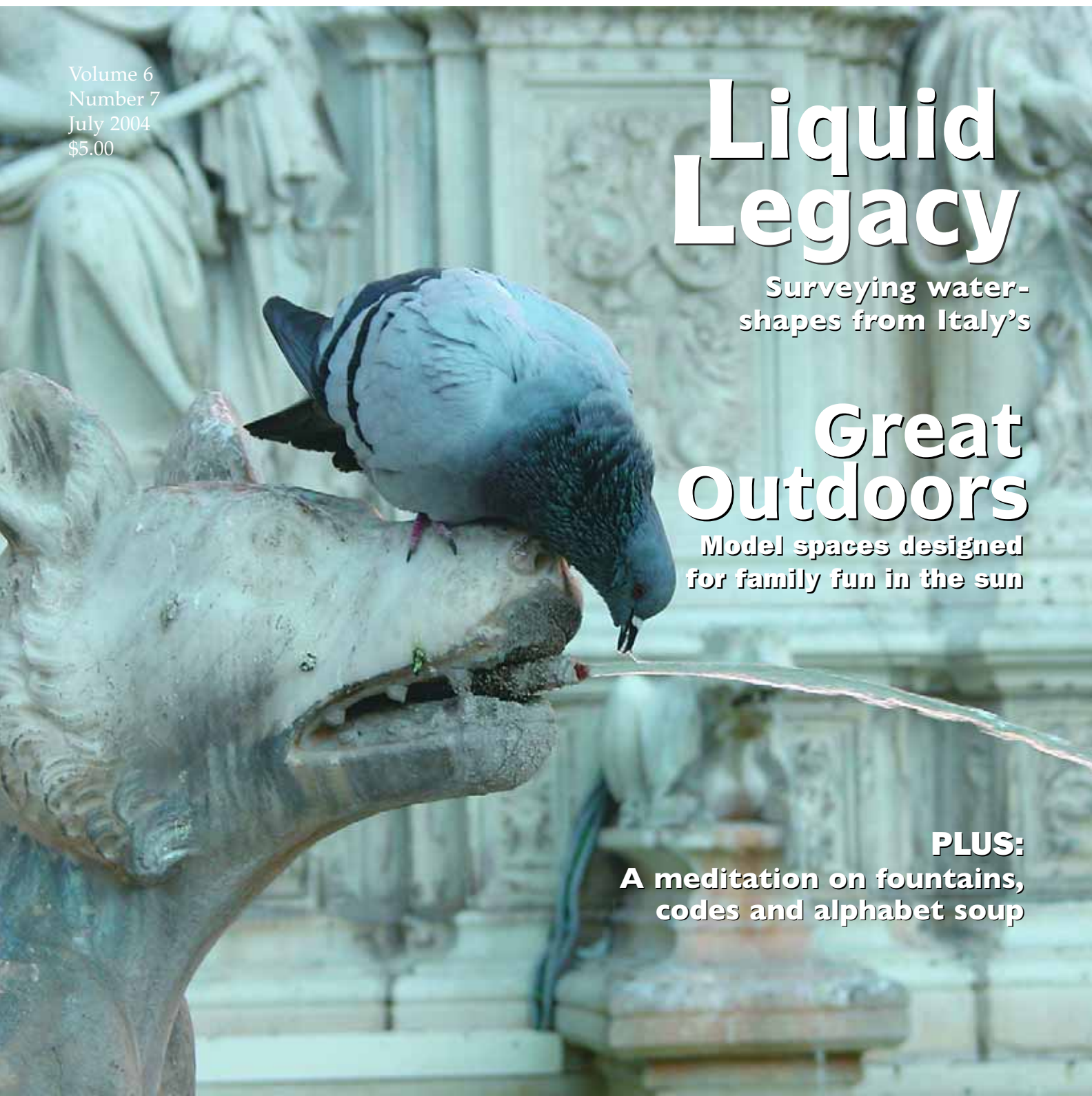

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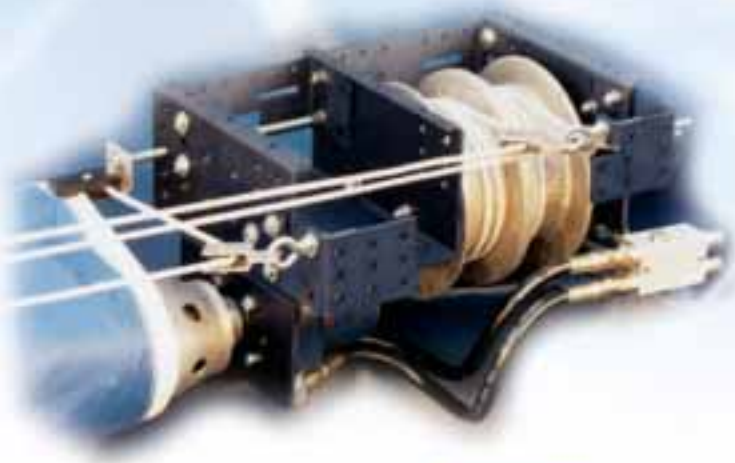

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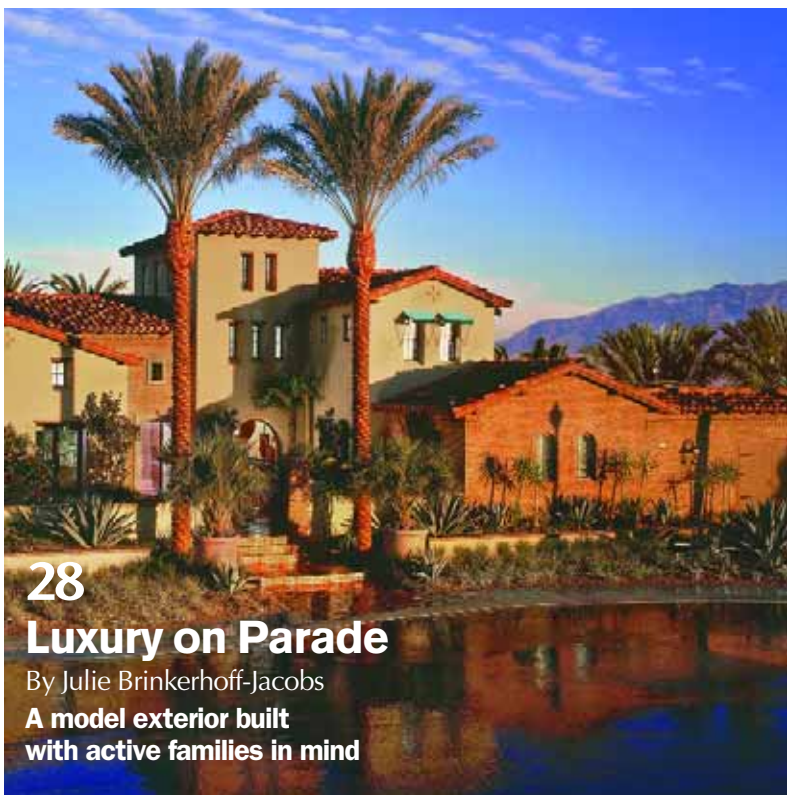
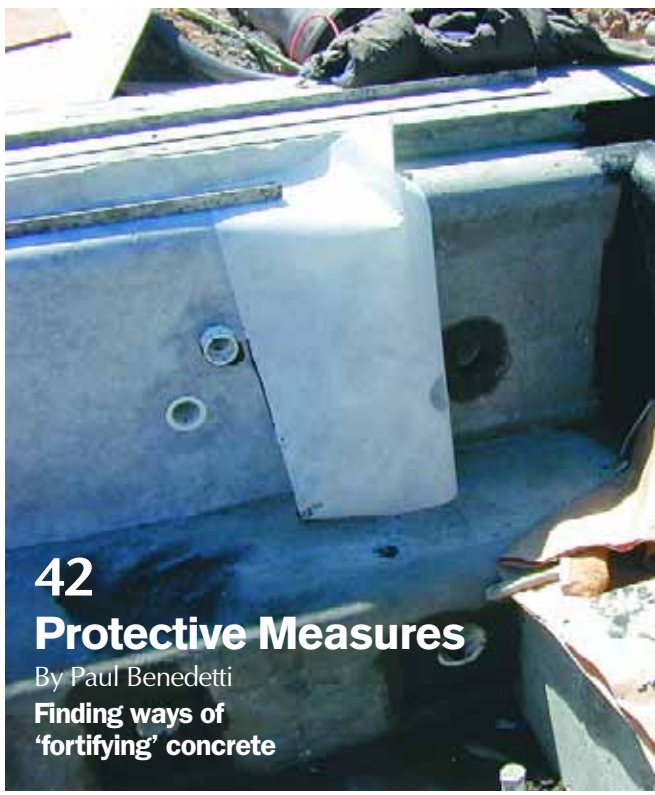
contents

July

features





WATERSHAPES
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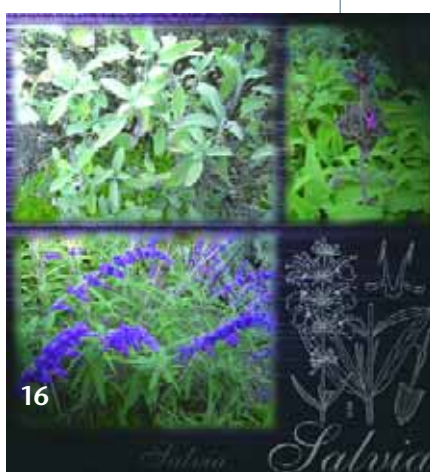
columns



departments

On the cover:
Photo by Mark Holden, Fullerton, Calif.

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By Eric Herman

Impressing With Simplicity

While discussing his column for this issue, I visited one of David Tisherman's projects and observed one of the most dramatic examples I've ever seen of the power of restraint in design.

He'd taken me to look at a wonderful front-yard watershape in the form of three decorative urns, each with a minuscule amount of water flowing over its brim to wet an "antiqued" ceramic surface with a delicate flow of water.

As David points out in his column in this issue (page 22), a more common approach in this sort of high-profile setting would have involved creation of a more aggressive upwelling of water and a bubbling fountain effect. In this case, however, he headed in the other direction and delivered a design that uses a minimalist approach to achieve a stunning visual and aural effect.

His column tells the full story, but I see this as so important a point that I want to highlight it here. Indeed, for all he does in creating super-projects that are as daring and bold as they come, this small feature serves as a perfect example of a theme that David has returned to time and again in his columns and feature articles – namely, that appropriate scale and a reverence for the needs of the setting should drive the work of the designer rather than the desire to impress clients with the most massive and overwhelming water effect they can afford.

As I stood on the street across from the composition's three urns and enjoyed a long look, I was struck by how intriguing they were and the way the small flow of water drew my eye toward their elegant forms and rough-textured surfaces – and by how well their simplicity and grace blended with the warmth and softness of the home itself. As I looked, the urns became less a focal point than an invitation to take in and absorb the beauty of the home's architecture, its landscaping and downslope vistas stretching to the Pacific Ocean.

Driving away, it occurred to me that this is the exact sort of thoughtful design practice that need not reside solely at the highest end of the market. Using smallish flows of water to draw attention to a stone, tile or (as in this case) ceramic material is something that can comfortably be applied in projects ranging from the most modest of projects to the grandest and most spectacular.

Of course, there's irony in the fact that Tisherman, a designer known far and wide for his self-confidence and outsized personality, has such a distinctive ability to allow subtlety to express itself at the forefront of his work. As he has often said, in print and elsewhere, "The watershape should not be the centerpiece of the space, but a component of an overall environment."

Certainly this is not a new idea and is one that can indeed be found in the works of David's design heroes – such towering figures as Frank Lloyd Wright, John Lautner, Ricardo Legoretta and, at the other end of the spectrum, the masters of Japanese gardening. The fact of the matter is that refined restraint, educated taste and abundant good judgment will always play prominent roles in design.

To this observer at least, that truth was abundantly clear as I stood on a street corner watching water caress the sides of three elegantly shaped pieces of pottery – an experience of rare aesthetic pleasure.

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July's Writers

BRINKERHOFF-JACOBS

Julie Brinkerhoff-Jacobs is president and chief financial officer for Lifescapes International, a landscape-design firm based in Newport Beach, Calif. Founded by her father, Don Brinkerhoff, in the late 1950s, Lifescapes often focuses on extremely high-end commercial spaces, including the grounds and swimming pools at the Bellagio Resort in Las Vegas and The Four Seasons Hotel in Los Angeles. A graduate of Cal State University, Sonoma, Brinkerhoff-Jacobs is a frequent speaker at industry events and has written numerous articles and papers on real estate and demographic trends. In 1989, she co-founded HomeAid America, a non-profit organization dedicated to building shelters for temporarily homeless people.

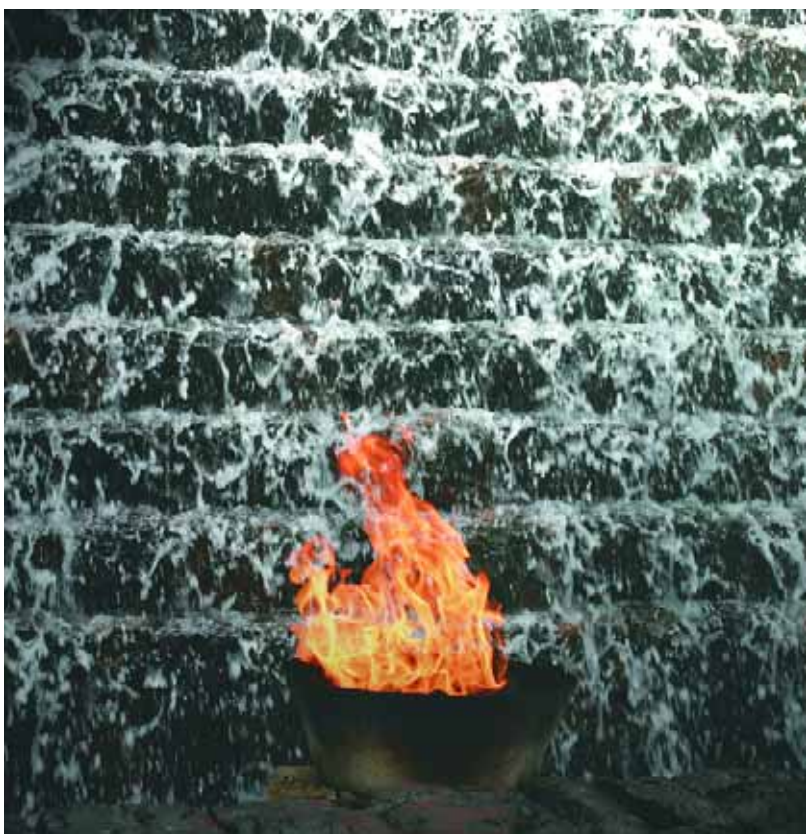
Dominic Shaw is a principal and director of waterfeature design for EDAW, Inc., a 900-person landscape architecture, planning and environmental resource firm with 23 offices worldwide. Shaw, who works out of the firm's office in Fort Collins, Colo., joined the firm in 1997 to lead its waterfeature design studio. This group works on EDAW projects and also serves the greater architect/developer community as a consultant for waterfeatures, swimming pools, ponds and constructed wetlands. In the 23 years before he joined EDAW, he worked variously as a product manager for a fountain manufacturer, owned and operated a fountain installation/maintenance company and worked as an independent fountain consultant.

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.

Mark Holden is a landscape architect, contractor, writer and educator specializing in watershapes and their environments. He has been designing and building watershapes for more than 15 years and currently owns several companies, including Fullerton, Calif.-based Holdenwater, which focuses his passion for water. His own businesses combine his interests in architecture and construction, and he believes firmly that it is important to restore the age of Master Builders and thereby elevate the standards in both trades. One way he furthers that goal is as an instructor for Genesis 3 Design Schools and also as an instructor in landscape architecture at California State Polytechnic University in Pomona and for Cal Poly's Italy Program. He can be reached at *mark@waterarchitecture.com.*

By Brian Van Bower

Virtual Realities



As watershape designs become ever more creative and adventurous, there's an increased need to help clients and other project participants visualize our plans.

Indeed, presentation is a topic of great importance these days for designers from both the pool/spa industry and the landscape trades, so much so that it's become a fixture on educational calendars and one of the cornerstones of the Genesis 3 curriculum. What has everyone excited about upgrading the way they present their ideas is that there are various good ways to get the job done.

To be sure, having the ability to draw is a tremendous asset – some would say an absolute necessity – but fortunately for those who are not gifted illustrators, there are several powerful tools at hand. In this column, we'll look at one of the more flexible and useful of the available systems: three-dimensional computer-aided drafting (CAD).

To do so, let's take a look at two projects I've recently completed in which the availability and use of this technology made a big difference.

in perspective

The first project had to do with a luxury condominium complex on New York's Long Island and was all about developing a shared vision.

The team wanted to see what the thing would look like in a format other than a basic plan or a hand-drawn rendering. I suggested doing a 3-D rendering in AutoCAD and was on my way.

The design team had been discussing water-features for the lobby of the building's leasing office and wanted something that would make a strong impression on prospective buyers while displaying the facility's logo. Someone in the group had seen a wetted-wall feature, and they all agreed (although tentatively) that this would be a good solution for the space.

Nobody knew how to make the idea work, however, so I was brought in to develop the concept. Before long, the original sketches had morphed to a final plan that featured a free-form black granite base surmounted by a straight, 30-foot wall covered by a small flow of water.

Originally, they'd discussed using a granite material for the wall, but I convinced them to switch to angled panels of glass that would be up-lit with a series of fiberoptic lights. They liked the idea, especially when I described the logo at the heart of a shimmering surface of tempered, frosted glass and the gleaming, 30-foot-long stainless steel manifold that would send water trickling down the glass surface.

The team included the general contractor, the architect, the owner's representative and an interior design/marketing firm – and they wanted to see what the thing would look like in a format other than a basic plan or a hand-drawn rendering. I suggested doing a 3-D rendering in AutoCAD and was on my way.

AutoCAD is great when it comes to generating 3-D images from flat plans. It's an involved (and fairly expensive) process that requires taking all the dimensional data (which the architect provided in this case) and inserting it into the system. Once that's done, the technology en-

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ables you to generate an ultra-realistic "photograph" of specific details from any location within the space.

I have access to a fellow who's an absolute AutoCAD wizard – Alberto Gonzales of HKARI Studios. Once he worked his wonders, we sent an image to the architect via e-mail.

The architect then had quality prints made and circulated them among the design team and the construction staff. Immediately, the discussion shifted from whether or not the design concept was the right one to ways that the project could be fine-tuned – something that could, with AutoCAD, easily be updated as we moved along. Soon, the project was ready for installation under the guidance of my good friend, Peter Cattano of Paco Pools in Baldwin, N.Y.

What amazed us was how close the finished project came in appearance to the 3-D rendering. In fact, unless you were familiar with the project, the computer-generated shadows, textures and ar-

The degree of detail available to the skilled AutoCAD operator is truly amazing, right down to the shadows and reflections. As can be seen in comparing the computer-generated version (right) and the project as installed, it's a powerful visualization tool.

chitectural details came across so well that it was tough to tell what was a rendering and what was a photograph. You see the glint of the stainless steel, the sheen of the granite, the flow of the water and the prominence of the up-lit logo.

This sort of rendering isn't inexpensive, but in this case it was worth every penny and resulted in a dramatic watershape that is *exactly* what the client wanted.

a step-by-step process

In addition to the power that 3-D renderings have in helping clients and design-team members visualize an idea, the technology can also help the watershaper more fully grasp the task at hand.

A case in point is a project I recently completed in Wellington, an affluent community in central Florida. A wealthy homeowner with a large, beautifully landscaped piece of property wanted to add a large, elaborate spa to a spot near an existing pool – something that would make a bold statement worthy of the money he was willing to invest in the project.

The space sat at the end of an existing patio, up a couple of steps in a large, garden area. Originally, the concept was to build the spa next to a gazebo that was to have big, therapeutic, hot-water cascades tumbling from the roof and into the spa. I did an initial concept drawing and participated in several meetings and discussions that set things on a better path: Eventually, the gazebo fell out of the plan and was replaced by a waterfeature that would serve as a visual backdrop for the spa along with a wall of greenery.

The spa itself was something special, a large, black absolute granite/glass-tiled vessel with a raised beam and a full-perimeter overflow. As for the adjacent waterfeature, the client latched onto the idea of something with a Mayan flavor, so we angled in on a stepped-temple structure with a cascade-wetted face to be topped by a sculpture.

With the basics settled, we began the fine-tuning process, and I suggested a fire effect that would reflect off the surface of the spa. The client wanted to flank the waterfeature with replicas of segmented columns found in Mayan ruins; he also wanted to top the waterfeature with a large statue of Buddha.

Although I'm generally on board when it comes to making my clients happy by giving them what they want, I was extremely concerned that this particular set of added features would really be overkill. I was particularly worried that the columns would be way too much for the space and only slightly less concerned that the sculpture would throw the structure out of balance (not to mention the possibility of the strong Asian element intruding on a Mesoamerican theme). Still, this was what the client wanted, so we proceeded with our work.

To make certain we all knew what was taking shape, I suggested commission-

Used properly, a computer can help clients 'see' the consequences of design decisions before anything occurs on site — as in this case, where discussing a computer-generated drawing (left) hleped everyone agree that the broken columns weren't needed in the final setting.

ing a set of 3-D AutoCAD renderings. The client agreed, and I called once again on my AutoCAD friend to input all of the plan data and generate separate drawings of the structure, the existing pool and the decking from two distinct angles.

start making sense

As almost always happens when a client really begins to "see" a designed space, he became excited about the project all over again and we immediately began talking about ways to adjust the design. Having the renderings was a help to me as well, because we'd gone through so many iterations that it was good to have something in hand to help me get a firm sense of the direction in which we were now heading.

Immediately, the renderings put my mind at ease about the effect the sculpture would have. Almost as quickly, the

client saw that the columns just didn't work and that removing them from the program would greatly increase the visual impression to be made by the water-feature while giving the overall composition a sleeker, less-jumbled look.

Best of all, we could plainly see that the raised granite-and-tile spa and rough natural-stone steps would blend beautifully with the green surroundings and provide the client with exactly the spectacular backdrop he wanted.

As the project moved forward, the client made some other changes, including selection of a mythical River God instead of the Buddha – to my mind a more appropriate choice if only for thematic reasons. Truth be told, I probably would not have included any sculpture atop the waterfeature, but the renderings had eased my concerns to the point that I knew it would look fine, whatever the choice he eventually made.

I was fortunate in this case to be working with another quality watershape contractor, Doug Hackl of Hackl Pools in Lake Worth, Fla. His execution of this highly involved project was outstanding.

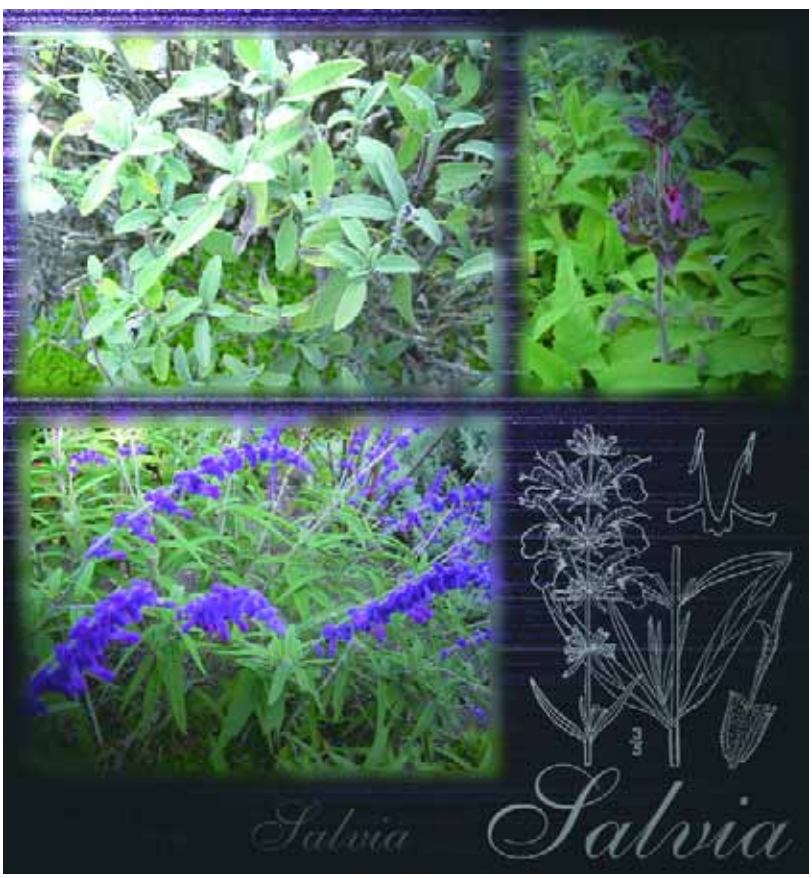
For both of these projects, the availability of 3-D AutoCAD renderings gave us all a baseline for understanding of how the projects would work in their respective settings, and I can't say for certain whether the results would have been so satisfactory had we not used this tool. At the very least, I suspect the path taken to the final results would have been much longer and probably more costly.

Certainly, not every situation calls for such an extreme form of presentation, but in these situations, CAD technology was extraordinarily helpful – and worth a long look if anyone on the design team (or, more important, the client) is having trouble visualizing the outcome. 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

Sage Advice



In preparation for creating plant palettes for my projects, I typically spend hours poring over my *Sunset Western Garden* book. I thrive on finding plants I haven't tried before, and I look especially for those I haven't seen in anyone's garden.

Before I'll try any of these discoveries out on someone else, however, I'll pick up a sample plant and bring it home to my own garden – part science project, part proving ground to see how the plants perform away from the nursery.

I've had many successes through the years and probably as many failures, but I learn something from every attempt. What I sometimes find are plants that are extremely versatile, quite hardy and very beautiful that I never even knew existed or that had simply passed on as being too common – or, in the case of Salvias, that were already growing right under my nose, as we'll see below.

more than herbs

Salvia is the largest genus within the mint family. Widely known as sage, I prefer to think of the types I use in my projects as *ornamental* sages to distinguish the common garden plants from the herb variety of sage that is often used for cooking (and a lot more).

When I take clients to the nursery to introduce them to a range of Salvias, they typically point out different varieties they like among all the available plants without even knowing they're looking at Salvias.

The typical growth habit of Salvia is upright, with smallish flowers ranging from white to deep purple and all colors in between. Some are woody, some are perennial and some are sold as annuals. They prefer full sun and ample water; when mature, however, many varieties can be quite drought-tolerant.

When choosing among Salvias, check to see if the specific type that's caught your eye is evergreen or deciduous. Generally speaking, it's best to go with evergreen varieties unless you're placing them in the back of borders where they will be camouflaged during the winter. Climate zone is a major consideration here: Salvias that might be evergreen perennials in my area might be deciduous annuals elsewhere, which makes checking with your nursery or local garden guide an important step.

These plants are great in a garden for clients who have requested plants that attract hummingbirds, bees and butterflies. Some varieties are actually notorious bee attracters, including *Salvia leucantha* (Mexican Bush Sage). Without any other guidance, the best way to determine if a particular variety will pose a bee problem is to observe it on a warm spring or summer day in the nursery *before* you purchase it.

I've also found that when I take clients to the nursery to introduce them to a range of Salvias, they typically point out different varieties they like among all the available plants without even knowing they're looking at Salvias. I believe the primary attraction is the upright growth habit and the splashes of col-

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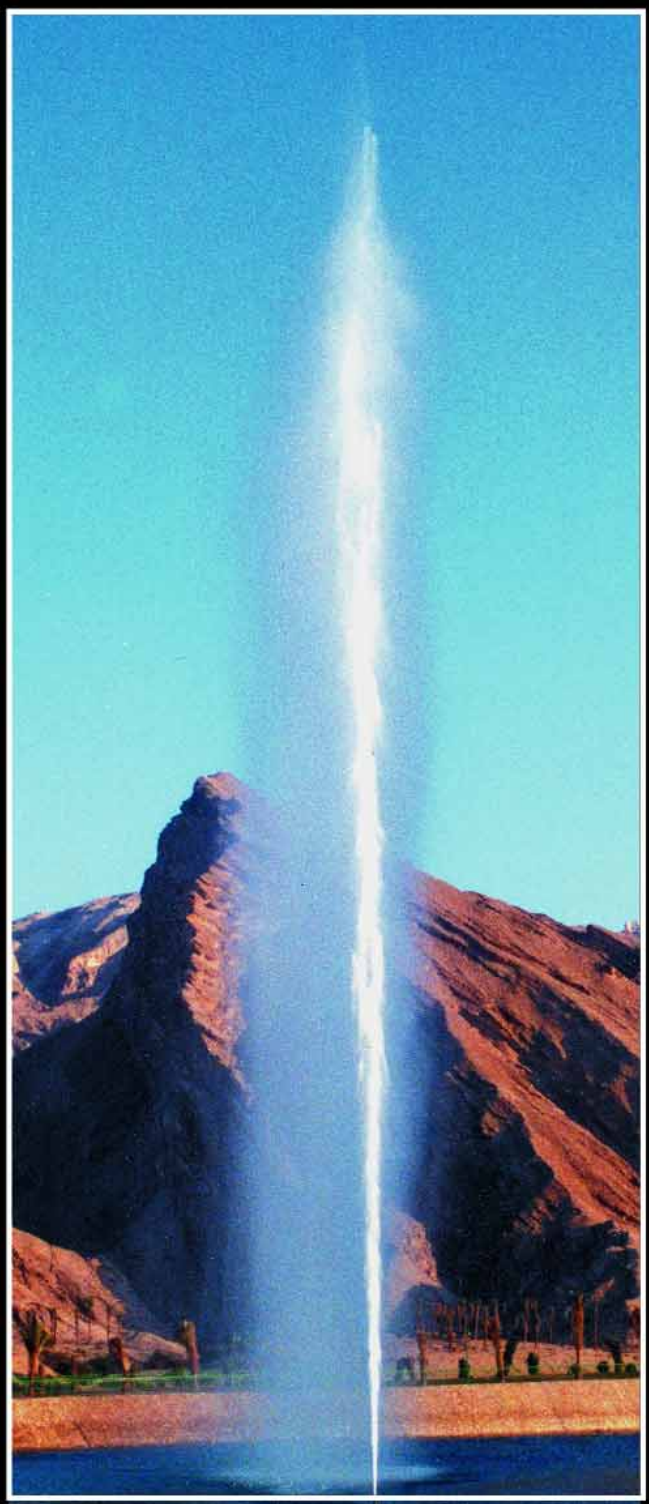

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or, but whatever the source, I find that my clients who request native plants are, just like the bees and the birds, drawn magnetically to Salvias.

creating style

The great thing about Salvias is that they can be used in almost any design style. The plants' forms lend themselves to contemporary-style gardens just as well as they do to wild and natural settings. Better still, these plants tend to generate little or no litter, making them ideal for placement near watershapes.

• In contemporary designs, I use Salvias by themselves either as individual plants or in masses. Set singly, one Salvia surrounded by decomposed granite or pebbles or stones can make a strong statement on its own; when massed, they quite effectively create flat planes of plants to complement or mimic the lines of contemporary architecture.

These plants tend to generate little or no litter, making them ideal for placement near watershapes.

• In more traditional settings, Salvia can be grouped in borders, set against other colored foliage and flowering plants or mixed into patterns of plants within a border. With designs of this type, I would gravitate to the more upright or rigid varieties.

• Natural, woodland or wild plantings can handle any of the Salvias. Here, the more asymmetrical, random or uneven the arrangement, the better. Salvias tend to look like native plants, which furthers the effort to create an "untailored" look.

Whatever the style, there's a Salvia that, properly used, will fit in beautifully. As always, I have my favorites, listed below; I've also found that nursery people have good recommendations to offer in leading me to the best choices for certain types of settings.

◗ **Salvia buchananii (Buchanan Sage).** This plant caught my eye only this year. It grows one to two feet high and wide and has brilliant, fuzzy, magenta flowers that stand out in any setting. It also has a very upright growth habit and is considered a shrubby perennial – perfect as a border plant.

◗ **Salvia coccinea (Tropical Sage).** Boasting colors ranging from white to bright red (and all hues in between) as well as many bicolor varieties, this tender perennial grows upright from two to three feet

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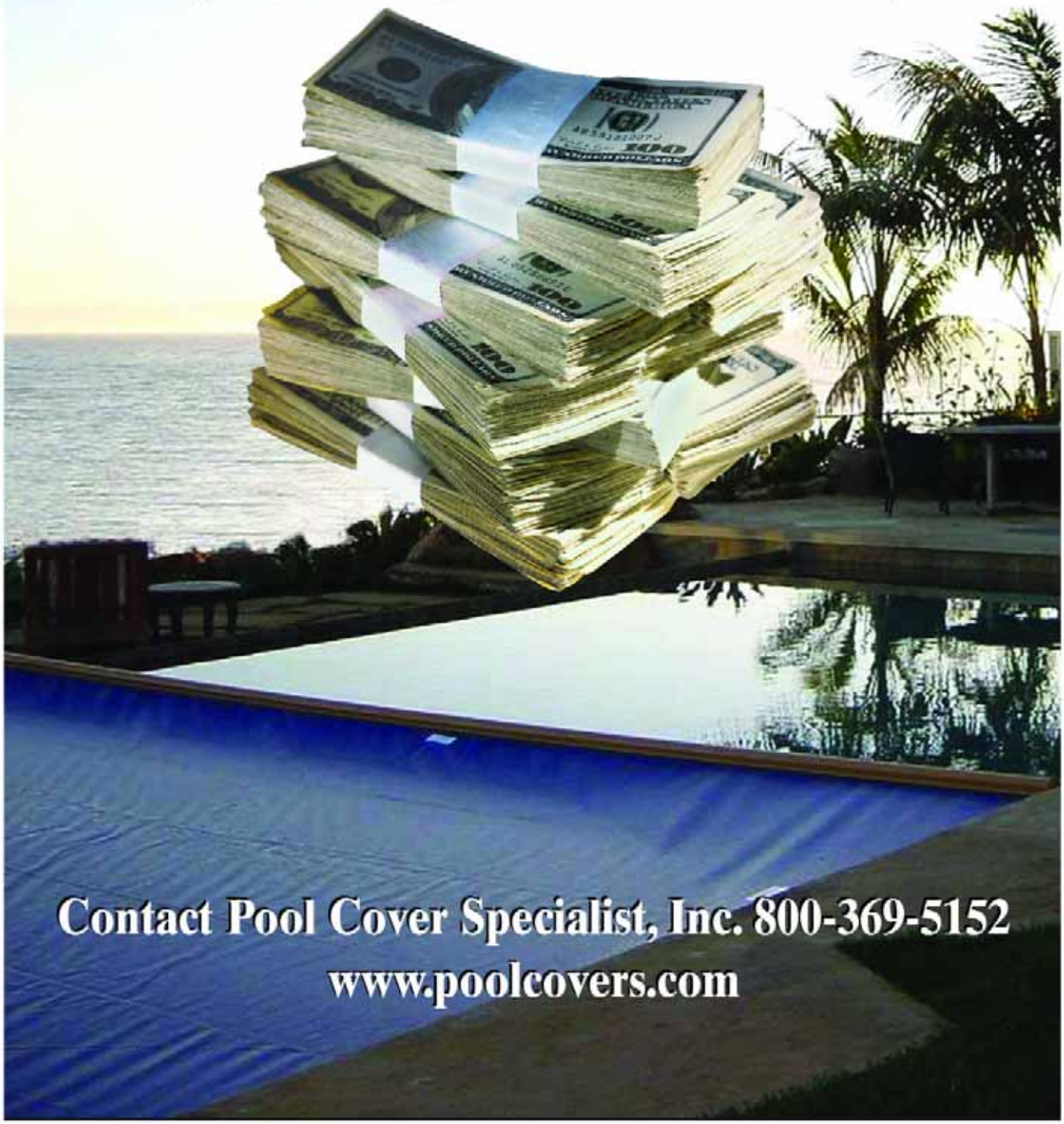

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high and wide. The range of colors it offers makes it particularly useful in mixed borders – or for a spot that needs a different color. You can often decide you need a color not yet provided by the rest of your plant palette and find a coccinea that fills the bill.

◗ **Salvia greggii (Autumn Sage).** This was the Salvia I mentioned at the beginning of this column that had been growing right under my nose. When I first planted my hillside garden nine years ago, I planted two of these woody perennials – one a fire-engine red and the other a bright magenta. The bright magenta one died a sad death resulting from lack of sunlight and competition from other plants, but the red one is still growing strong, despite my occasional thoughts of removing it.

In my garden at least, I have found these Salvias to be quite drought-tolerant once established. They grow to four feet high and wide, but I keep mine trimmed to about a two-foot mound and prune it severely either during August (so it can regenerate before the dormant season) or during the winter – a choice determined by local climate zone.

It's a staple of the culinary world, but I often use Garden Sage an an ornamental as well as for its tasty side benefit.

◗ **Salvia leucantha (Mexican Bush Sage).** This was a popular plant during the 1990s and works well in drought-affected areas – but as mentioned above, this variety is a bee magnet. For people, however, the main attraction is the appearance of brilliant, fuzzy, purple flowers on blue-gray stalks, accented with white calyxs. These plants can grow to three or four feet high and as wide as six feet, but they take well to pruning and shaping.

◗ **Salvia officinalis (Common Sage** or **Garden Sage).** This plant is the one made famous in the 1960s by Simon and Garfunkel (remember parsley, sage, rosemary and thyme?) and has long been a staple of the culinary world. I have often used this as an ornamental plant as well as for its tasty side benefit and find that it's a particular favorite among clients who want to mix herbs and vegetables in with their perennial borders. My personal favorites here are the regular grey/green sage, purple sage and variegated sage. Mixing these as a trio works well in any border.

◗ **Salvia 'Waverly.'** A subtle selection for a perennial border, this tender perennial tends to be floppier than other Salvias. I find it is best when placed behind more upright, sturdier plants that help it stay in place – or in a wild border where it doesn't call for pruning or shaping. Its dusty purple-and-white flowers are a gentle accent that works well with most other border plants.

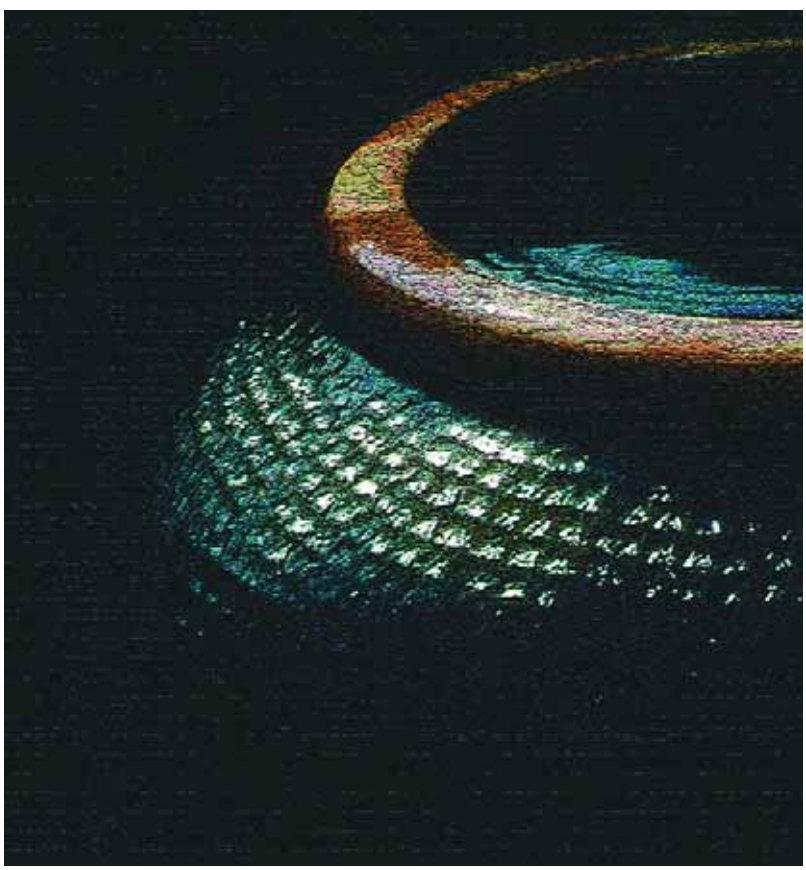
There are many other varieties that are just as appealing and useful as these, and I'm sure many of you already have your favorites. I urge all of you to keep this genus in mind when looking for standouts as well as background players for your garden palettes: Their versatility is endless! WS

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

Urn Points

During the day, the sun plays on the wetted surfaces and textures to create amazing, glimmering reflections that are quite eye-catching.



It's unusual to think of such a wonderfully decorative watershape in this way, but the one featured in this edition of "Details" was the result of a client's desire for a measure of safety for the front of his home.

The house is located on an intersection in a hilly part of Manhattan Beach, Calif., where the steep, downhill orientation of the streets occasionally lead cars to make turns at unwisely high speeds. Given the orientation of his front door, my client was concerned that, with a bit of very bad luck, he might someday find an out-of-control-driver's car in his foyer.

As is the case with many spaces in this beach community, the lots are generally compact, meaning that homes of any size come right up against the property lines. I had designed and installed the swimming pool and spa in his backyard, and one day he mentioned his concern about wayward traffic.

It's a spectacular home in a graceful Mediterranean style, so we started talking in general ways about what sort of "barrier" would fit with the appearance of the home. We talked about setbacks, the fact that the city wouldn't allow him to put up any substantial sort of wall and the height restrictions involved in putting anything so close to the property line. After a time, I suggested that we install something that would provide both visual interest and a physical obstacle.

a soft statement

My idea was to place heavy, concrete-filled objects – basically decorative bollards – that would be visually appropriate to the setting in terms of size, scale and style. They would take the form of three large urns that would overflow with a very small volume of water, the thought being to make everything visually subtle. The water would flow down the sides of the urns and collect in a hidden catch basin.

I've seen this approach used before and generally haven't liked the results, invariably because the designers seemed to have a universal urge to light the urns from within and use overly aggressive flows of water to create something of a spewing, volcanic effect.

That's the last thing I wanted to do, particularly in this setting: Everything about this home is very soft and warm with rich earth tones – light olive house, copper gutters and bronze fences along with soft-looking hardscape materials (mostly Sweetwater stone), elegant papyrus and a multitude of brushy, soft grasses.

In keeping with that visual "mood," my idea was to create an effect that put its accent on subtlety and the appearance of a very small amount of water caressing the textured surfaces of the urns. In fact, I wanted the appearance to be *so* subtle that a casual observer would only notice the flow by slowing down to take a closer look.

After we discussed possibilities, the homeowners themselves found the three ceramic handmade urns, varying in height from 24 to 42 inches with diameters between 24 and 30 inches at their widest points. All three were finished in rough, somewhat distressed earth tones that suggested great age. Two

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were textured with embossed grids, the third had a simpler irregular surface, and all three picked up the colors of the house.

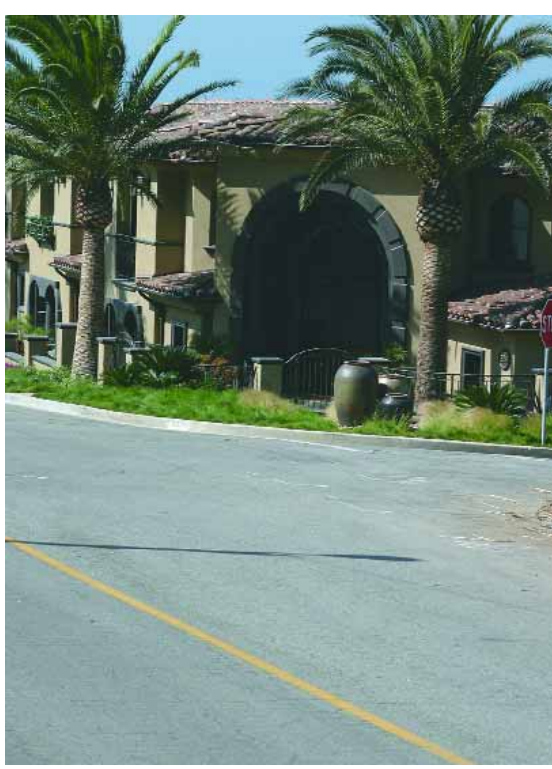
During the day, the sun plays on the wetted surfaces and textures to create amazing, glimmering reflections that are quite eye-catching. We surrounded the urns with small brass fixtures buried in the landscaping to recreate this effect through the evening.

Any time of day or night, the water appears to flow directly onto the ground. The effect is so convincing that, once the system was installed, we received an anxious call from a concerned building inspector who had driven by and was worried that a hose was running somewhere and that the front area of the home was being flooded.

a simple plan

In actuality, the water flows through a bed of washed, blonde Sonoma river rock that closely resembles the color of the trunks of nearby Queen Palms and was intended to be somewhat evocative of Japanese gardens. We built a reservoir beneath the urns around a 42-inch-diameter, sub-grade concrete pedestal plumbed with three one-inch lines that ascend through the waterproofed and then concrete-filled urns.

The system is driven by a 3/4-horsepower pump located about 150 feet away. The total flow to the urns is no more than two or three gallons per minute. The reservoir – a ten-foot circular basin – is completely hidden by the bed of river rock and surrounding landscaping. The steel-reinforced, poured-in-place structure is 18 inches deep, the maximum depth it could be without being considered a swimming pool by building inspectors. With the overflow line, it holds water to the 17-inch level.



Upon examination, the three urns reveal tiny flows of water playing in the light on their highly textured surfaces – a reward to those who slow down enough to take a look, which is all part of the idea of increasing safety at the home's entry.

A trio of three-inch suction lines are arrayed in the basin's floor, which is pitched to an access grate to allow for ease in cleaning. There's an overflow standpipe to accommodate rainfall, and there are valves to control the flow to each of the urns, with a bleed-off valve to relieve any back-pressure on the pump. (These are all hidden in a landscape box just a few feet away from the waterfeature for ease of access and use.)

At the inside upper edge of the basin and the centered pedestal, we formed a notch that supports four galvanized steel grates – basically screens that keep the rocks where they belong. The water flows up through the urns, over the brims and down the sides before disappearing into the bed of river rock and dropping into the catch basin. The rocks and grates are all easily removed for cleaning – particularly at the designated cleaning-access grate.

The tops of the urns are on different levels: They're all handmade and quite irregular, so we made no attempt to get their brims even. In fact, the slightly irregular flow this produces at the brims adds to the spontaneous nature of the effect. Especially at night, when lit, the pots stand out and create a beautiful focal point.

As important, the three urns were set into the central pedestal when it was poured and were (after being thoroughly waterproofed on their insides to prevent any damage from materials in the concrete) filled with concrete to within a few inches of the brim – enough to make them *extremely* heavy as well as completely immobile and capable of impeding the progress of any vehicle that might careen onto the property.

lessons in less

Once the urns were installed and the setting completed, my client and I spent some time in an inconspicuous place watching the traffic go by. We actually saw a number of cars slow down to get a look at the watershape – and it didn't take much thought to know why.

The way the light plays on the subtle water flow and flickers like a field of stars on the textured surface is visually arresting. And when the breeze comes up – as it often does so near the ocean – the water becomes even more textured and the effect more pronounced.

The lesson of this "Detail" is that water effects do not need to pour hundreds of gallons over weirs or mountains of stone to be visually compelling. The key to success in creating these sorts of interesting and beautiful features is an understanding of *scale*. As I've written many times in these pages, the power

The water flows up through the urns and down the sides before disappearing into the bed of river rock.

of a watershape comes from its ability to complement a setting rather than dominate it.

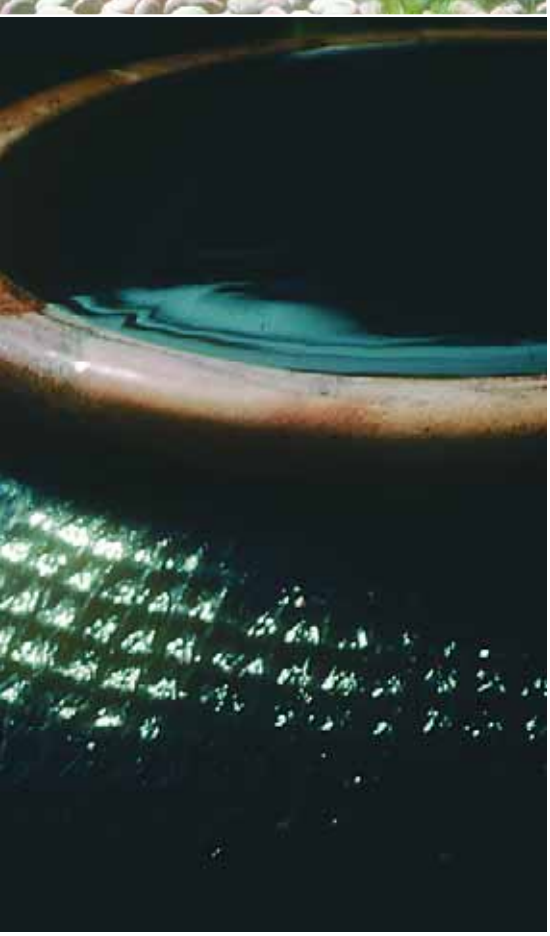
If this feature had been built like others I've seen with an aggressive flow erupting out the top of the urns, all of the grace and dignity of this watershape would have been lost. It would have looked like a common fountain – yet another example of upscale grandiosity – and there would have been little reason to pay much attention to it. As it is, observers of this watershape really need to pay attention to see the water, and only when that happens are they rewarded by this delightful effect.

Positioned at the entrance to the home, it offers an interesting welcome to visitors. More significant, perhaps, is the effect it has as one *leaves* the home – a goodbye spiced by an engaging impression of moving water and the subtle noise of the trickling flow.

Ultimately, we all hope that these urns will never need to stop a car from rolling through my client's front door and, frankly, I doubt it'll ever happen. In this case, however, the homeowner's caution sparked the need to create a beautiful little work of art that is sure to delight and intrigue those who visit the home – or simply drive on by. WS

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.*

Given the slight water flow, the textures of the urns' surfaces are the key to the distinctiveness of the effect. In sunlight or in the evening with well-targeted landscape lights, the urns glisten and shimmer with special radiance.



A project with charitable as well as commercial ambitions, 'The Ultimate Family Home' was created to showcase state-of-the-art home design – both indoors and out. A key force behind the show home's exterior design was Julie Brinkerhoff-Jacobs, whose firm, Lifescapes International, was responsible for creating outdoor spaces and watershapes with a well-considered variety of deluxe, family-friendly features.

By Julie Brinkerhoff-Jacobs

Luxury on Parade

A tremendous amount of synergy and teamwork went into the making of "The Ultimate Family Home."

Initiated by *Builder* magazine (the official publication of the National Association of Home Builders) and Pardee Homes (the Los Angeles-based developer of the Nevada Trails neighborhood in which the home was built), the project unfolded as a partnership between the magazine and the developer's Las Vegas office along with Bassenian-Lagoni Architects (Newport Beach, Calif.), Color Design Art (Los Angeles) and Lifescapes International (the Newport Beach-based landscape-architecture firm).

"The Ultimate Family Home" opened in January 2004 in conjunction with NAHB's International Home Builder's Show in Las Vegas and has hosted thousands of visitors who have toured the property since it opened.

We at Lifescapes International were asked to design the exterior environment to include a wide variety of family-friendly functional and recreational areas. To do so, we worked hand in glove with Valley Crest Landscape Development, our one-stop landscape contractor in the Las Vegas area, to create a setting that defines an exciting set of project possibilities for homeowners and home builders alike.

Oasis by Consensus

We were chosen for the project largely because of our firm's extensive experience in designing residential and resort communities throughout the world and particularly in the Las Vegas metropolitan area.

Having completed more than 50 projects in that area since 1980, we've watched the city mature through the years and appreciate the fact that its needs continue to grow and adapt to change. With nearly 5,000 people moving into the area per month and a regional population that now exceeds one million, there's valid concern about water resources and a big focus these days on sensible water management – a key component of our work on this project.

In fact, our primary design intent was to create a garden setting that reflected the needs and aspirations of a modern family looking to maximize its home-based experience in a way that dealt responsibly with water resources.

The first of the home's four 'zones' doesn't involve water – other than the lake to which the home is adjacent. The emphasis here is on making a statement about drought-tolerant landscaping and on setting up a grand entrance.

The design itself sprang from extensive market research conducted in the summer of 2002 with three focus groups. Perhaps the most significant of the three groups (from our perspective as watershapers) was the one made up of children from eight to 16 years of age.

Gathered by San Diego's Marketplace Research & Consulting, the research revealed a strong desire for a home that would balance a need for family interaction with the desire for individual pursuits within the home. It also indicated that these families wanted spaces and amenities that increased the convenience of home life while lowering operating costs and allowing for flexible use of spaces throughout.

Using the research as a point of departure, the landscape design went through several iterations and months of meetings with the architects, the interior designers and the principals at Pardee Homes. It was an interesting challenge compounded by the fact that the project involved mostly sponsorships and in-kind donations – meaning that we had to incorporate these elements appropriately within the overall design.

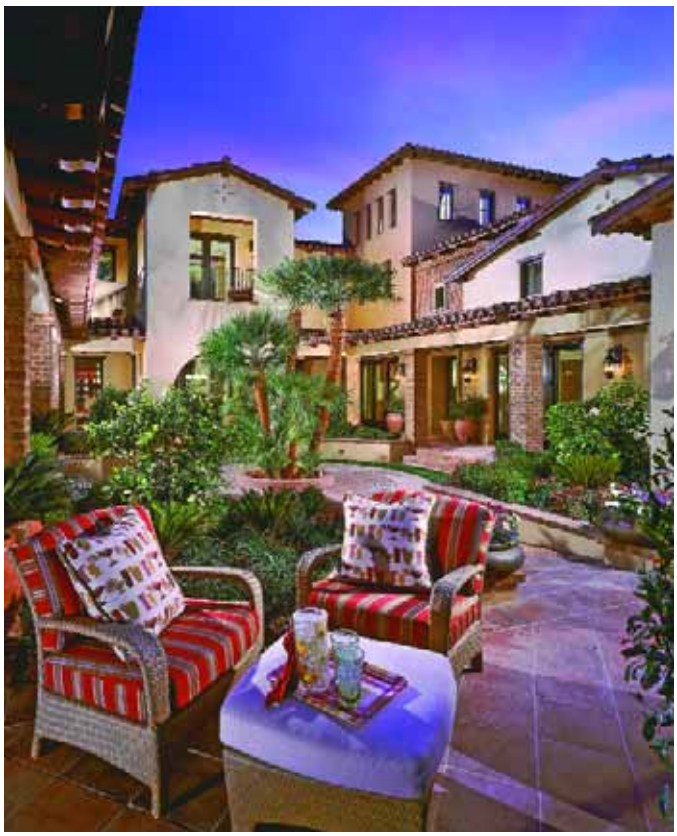
The house itself is in a Spanish Colonial style, with warm earth tones and soft natural materials used throughout. The gardens fit with that styling but at the same time serve as a sympathetic reflection of desert geography and surrounding ecosystems. All of the hardscape around the home, for example, is colored in muted desert tones, allowing the plantings to provide soft, colorful accents just as they do in a natural desert setting in springtime.

Indeed, the feeling that we were striving for in 13,500 square feet of hardscape and 7,000 square feet of planted areas featuring more than 100 drought-resistant trees and more than 20 desert-friendly species of shrubs was that of a desert oasis – a cool, comfortable, enveloping retreat from an arid climate.

Zone by Zone

Our design objective for this unique residential garden was to create comfortable

The entry courtyard introduces the first of the project's water elements – a modest fountain that greets visitors with the sight and sound of moving water while the plantings and surfaces keep with the overall theme of drought tolerance.



Compared with the formality of the front courtyard, the rear courtyard is cooler, more intimate, greener, more heavily planted and more welcoming to family activities and guests. The water elements here include a pop-jet fountain (not seen in operation) that encircles the central stand of palms.

spaces for comfort and relaxation as well as for an active family life, and we did so using a four-zone approach that kept a close eye on the needs and desires identified by the focus-group families. Water-management issues were addressed by focusing water use in areas of the garden where the family would gather and minimizing water use in the less-active garden areas.

Zone 1 includes the approach off the main street moving through the neighborhood as well as the gently sloping yard outside the gated front yard. Our emphasis on drought-tolerant, xeriscape landscape materials began curbside with majestic palms and other verdant materials marking the entrance and continued with fruitless olive trees (a Las Vegas city code requirement) that suit the desert climate while providing a much-needed shade canopy at the home's entry. A textural pattern of agave, fruitless olive trees, citrus trees and desert grasses mark the home's gated entry as well.

Zone 2 is a formal courtyard accessed via a Mediterranean-influenced wrought-iron gate. The area features a small, tiled fountain that welcomes residents and guests with the soothing sight and sound of moving water. In keeping with the water-management theme, the fountain uses water sparingly and has minimal splash to minimize evaporation.

Pavers (donated by Boral Bricks of Roswell, Ga.) were set on the walking surfaces with sand and gravel for reduced run-off and increased percolation. The lawn area just to the left of the entry fountain is greenery with a difference: The area is "planted" with artificial turf (donated by Premier Turf Solutions of Las Vegas) that requires no watering and little maintenance. Potted citrus trees line the edge of the lawn.

Zone 3 is the family's oasis, a place with a focus on entertainment in which water plays a prominent role. Traditionally, water provides respite from summer temperatures in desert climes. Here, we used water in select areas of the zone in three forms – an intermittent dancing-water fountain, a spa, and an interactive swimming pool.

For the central courtyard, we commissioned a water-smart fountain from WET

Charitable Ambitions

It is most fitting that a project known as "The Ultimate Family Home" should benefit the transitionally homeless.

Pardee Homes, the builder behind the project, is a key supporter of HomeAid America, a non-profit organization that builds shelter for the temporarily homeless nationwide. The group's focus is to get women and children moved into temporary shelters (from six months up to two years, depending on need and the care provider's programs) and on their way toward a self-sufficient life.

"We recently established our twenty-second HomeAid chapter in Las Vegas, and we wanted to help get the chapter started with dollars in its coffers and public visibility by giving tours to local residents of 'The Ultimate Family Home,' " explained Hal Struck, Executive Vice President of Pardee Homes and a member of the HomeAid's board.

For more information, visit the organization's web site: *www.homeaid.org.*

– J.B.-J.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The backyard is designed purely for family fun, from the big, covered, multi-function patios to the large lawn and the pool with its raised spa. Beyond this core, the tree-house, grotto and waterslide are special touches that make a big difference for the kids.

Design of Universal City, Calif. The deck-level "pop-jet" fountain they developed and donated sends quarter-sized droplets into the air to provide a playful atmosphere for children and parents alike.

In the evenings, when the children are either in their rooms or out and about with friends, parents and *their* friends can rest on the raised seat walls that surround the courtyard. With the jets turned off, the courtyard becomes a "conversation pit" – a simple, quiet, brick-paved patio. In the center of this courtyard stands a cluster of Mediterranean fan palms, emphasizing the home's warm and exotic architectural themes.

Backyard Play

Throughout the interviews and research that went into preparing for this project, the families said they wanted relief through the warm summer months, specifically in the form of a swimming pool/grotto environment.

The swimming pool in Zone 3 is the focal point for the space. It started out as a basic rectangle, but as our design work progressed, it expanded to include a curvilinear offset at one end that accommodates a beach entry as well as a splash-down area for a waterslide.

The pool now has a footprint of 25 by 30 feet and is four feet deep. The edges are finished with a terra cotta-colored ceramic tile, and the interior is a medium-

gray plaster that gives the water a cool, lagoon-like look. Above one of the pool's corners and adjacent to an outdoor-dining area and shade structure is a raised, 12-foot-diameter spa designed to accommodate six to eight people with ease.

Fun comes in the form of a rock waterslide that was hand-crafted by Valley Crest's skilled crew to emulate spectacular rock formations found in the nearby Valley of Fire, a local geological attraction. The waterslide, which begins at the height of 10 feet and follows a sweeping curve into the pool, can be accessed in two ways: from a set of steps at the rear of the rock structure and from a tree-house that overlooks the pool area.

The tree-house also rises 10 feet above grade and is essentially a self-standing observation platform designed for kids during the day and for adults at night, with views back to the lights of the distant Las Vegas strip. Made of Choice Deck, a recycled-wood material donated by Weyerhaeuser (Santa Clarita, Calif.), the entire structure is built around a mature Canary Island palm that provides shade and a visual canopy over the tree-house terrace.

Flanked by a combination of mature trees and flowering shrubs, there's also a secluded, raised grotto placed near the stairs of the tree-house terrace to provide a place for outdoor campfires at night or a cool spot to retreat from the afternoon sun.

The zone also features an outdoor pavilion with elaborate amenities – everything from three overhead televisions and a fireplace to a central barbecue area, an auxiliary cooking area, a loggia-covered dining area and a refrigerator and sink – all meant to let the homeowners take full advantage of the mild evenings that often settle in at the end of warm desert days.

Rounding out the zone is a decorative "solar trellis" fitted with panels that supplement the home's power supply while sheltering game tables below; a motor-court space with pavers that define areas for half-court basketball, four-square and tetherball; and a quarter-pipe skateboard ramp. All areas of this zone are connected internally and to other areas of the property by meandering, warm-toned stone pathways.

Zone 4 is the active children play area located on the southern side of the property, isolated around the corner and away from the entertainment-oriented backyard. Here the children have a variety of sport activities available to them, including a combined half-court basketball/ paddle tennis area.

Lost in Space

Once completed inside and out, the home became a place where we all could see a modern family conducting its life in comfort and convenience while seeking entertainment opportunities that were once the exclusive domain of commercial resorts.

Indeed, with so many different areas and activities, it's easy to find space for individual time and for group activities – just the sort of family-friendly ambiance we were all after in this grand collaborative effort. As Don Brinkerhoff, the CEO/FASLA of Lifescapes International states, "This house is a family resort!"

Key Participants

As was noted in the accompanying feature, many of the construction materials used in "The Ultimate Family Home" were donated by interested suppliers.

By the time work was completed, products worth nearly $500,000 had been used, including:

Rear courtyard fountain: Wet Design, Universal City, Calif.

Drip irrigation systems: Rainbird Irrigation Systems, Upland, Calif.

Artificial turf: Premier Turf Solutions: Las Vegas, Nev.

Custom pottery: International Garden Art, Santa Ana, Calif.

Plant materials were either donated or discounted by Grow West Nursery, Jodan Farms, Norman's Nursery and Orange County Nursery.

– J. B.-J.

Code requirements for public pools and spas are well established in most jurisdictions, but specific guidelines governing the creation of decorative watershapes are far less widely developed, notes fountain specialist Dominic Shaw. Having spent a career designing and building high-end fountains here and abroad, he has grappled with the fragmented state of fountain-related codes and offers a personal guide to keeping things straight.

The Codes Less Traveled

By Dominic Shaw

Composition of this article began with an e-mail I received a while ago from a colleague working in Australia. "What," he asked, "is the maximum allowable depth for a fountain in the United States?" As simple as it sounded, when I took the time to research the issue I found that there was a noticeable lack of definition.

I took the next logical step and called various people I know in the watershaping industry and asked them the same question. Surprisingly enough, nobody could point me to any code, regulation or standard that defined what depth a waterfeature's pool could or could not, should or should not have.

Even so, we are responsible as designers and builders for understanding and complying with codes in effect in all jurisdictions in which we work. For professionals including landscape architects, architects, engineers and high-end watershapers, those geographical ranges can be very wide indeed.

To keep things from flowing too freely, design professionals are licensed by individual states as a condition for issuing drawings, which presumes that they have studied and passed a test demonstrating familiarity with the state's requirements for their discipline. While that is all well and good, the water becomes more than a little murky when it comes to fountains.

Depth Charge

One of the truths about the fountain sector of the watershaping industry is that there is a general lack of standards that apply directly to the design and installation of these watershapes. Up until a few years ago, in fact, the only code that specifically referred to "fountains" was the National Electrical Code (NEC).

That is not to say that fountains, waterfeatures, ponds and other watershapes that fly under explicit regulatory radar are not affected by codes; rather, it means that there are very few direct references to them and we therefore are left, along with local officials, to interpret codes and regulations as they apply to specific projects on which we are working.

That lack of definition changes from time to time as a type of watershape becomes common enough that regulators pay attention to it. Interactive fountains, for example, are now regulated by a few states because the health issues related to their use are similar to those of swimming pools. For the most part, however, the state of today's codes with reference to fountains is unclear at best in a number of key respects.

To begin with a specific point, let's return to my Australian friend's question about water depth: Most fountain manufacturers have set up their products for operation in 16 to 18 inches of water – more or less an accepted standard in the industry. I could find no foundation for that standard in the literature, but what I *did* find leads me to an educated guess about its evolution.

I found direct references to water depth in just two design-oriented books: Craig S. Campbell's *Water in Landscape Architecture*, first published in 1983; and the current volume of the *Timesaver Standards for Landscape Architecture*, published by McGraw Hill, which includes a chapter on "Pools and Fountains" by the late Dick Chaix of CMS Collaborative. Both sources say simply that a fountain's water depth should designed in such a way that the vessel cannot be classified as a "swimming pool" under the Uniform Building Code (UBC) – a definition by exception if ever one existed.

So I turned next to the 1997 edition of the UBC (Volume 1, Appendix Chapter 4) and found the definition of a swimming pool as "any structure intended for swimming or recreational bathing that contains water over 24 inches deep. This includes in-ground, aboveground and on-ground swimming pools, and fixed-in-place wading pools." That leaves a fair bit of latitude for fountain designers, and it's just about all we have to go on.

Safe Treatments

Based on this definition and coupled with common design recommendations, it would appear that 24 inches would be a maximum "legal" depth for a fountain. Applying this concept to a real-world installation, however, raises other issues.

Let's presume, for example, that we are building or designing a fountain with a 24-inch water depth and that the vessel has a skimmer. Allowing for the height of that skimmer above the water level

(four inches) and assuming adequate concrete cover above the skimmer (two inches) as well as a coping stone and mortar bed (another four inches, give or take), we could easily end up with a 34-inch span from pool floor to the top of the coping. If such a fountain were built *into* the ground adjacent to a plaza or walkway, both UBC and the Americans with Disabilities Act (ADA) would require the installation of a guardrail around the fountain.

I've stretched things a bit to make my point, which is that, depending on the arrangement of the installation, different codes and regulations may come into play as a project unfolds.

Working through an example such as this one is what leads me to observe that the current 18-inch "standard" observed by the industry developed through consideration of the type of installation just described. This, in other words, is why most fountain equipment is now set up for 18-inch-deep vessels.

Depth isn't the only consideration around which informal "codes" have evolved for fountains: Let's take water sanitization as another example.

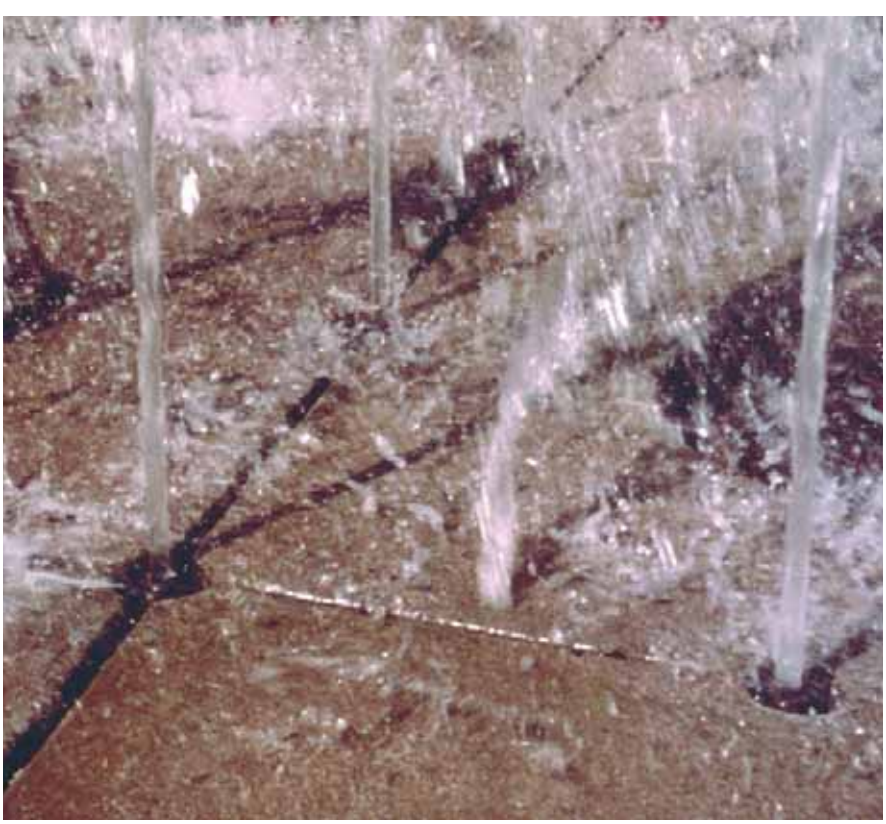
For the most part, if chlorine is being used, then draining and backwashing of the watershape must flow to a sanitary sewer. If chlorine is *not* being used, there is the possibility that the drains can be connected to a storm sewer. Experience shows, however, that most municipalities require drains and backwash lines to be connected to sanitary lines, the prevalent thought being that even without routine chlorination, there's a likelihood that the fountain manager will occasionally broadcast chlorine to control algae.

At the same time, most municipalities want fountains' overflow systems to be tied to storm sewers, the thought being (with outdoor fountains) that inspectors and/or plan checkers do not want a major storm event to over-charge the sanitary system. To accommodate that inconsistency, agencies are requiring that both drains and overflows be connected to the sanitary system – but with the proviso that the size of the pool must be weighed as part of the decision.

All this does is reinforce the point that it is *always* a good idea to check with in-

CONUNDRUMS: A lack of clarity in the codes governing watershapes in public spaces often lead to post-construction modifications and addition of barriers to keep pedestrians away from edges (A). Some even must be marked as hazards if they've been placed in what become main traffic streams (B).

MULTIPLE MASTERS: The increasing popularity of interactive dry-deck fountains has led several governing agencies to get into the act, with municipalities setting water-quality standards while enforcers of the Americans With Disabilities Act are mandating allowable gaps in pavement for ADA-accessible fountains.



spectors during the design phase to determine what their specific requirements will be. Any conflicts that emerge should be resolved as early in the process as possible to prevent misinterpretations, reinterpretations and crippling delays down the line.

In the Vault

Equipment vaults bring an altogether different set of considerations into the codes-and-regulations formula. By definition, any underground equipment vault is a "confined space" as defined by OSHA – that is, a space:

- large enough and so configured that an employee can bodily enter and perform assigned work; and
- with limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults and pits are spaces that may have limited means of entry); and
- not designed for continuous employee occupancy.

While the confined space itself is not so much an issue, the possibility of creating a hazardous environment *within* that space can lead to the designation of the vault as a Permit Required Confined Space (PRCS). Should this happen, the requirements to enter the space and perform maintenance are strictly defined and regulated.

One of the issues to consider has to do with possible atmospheric conditions in the vault. Most vaults have ventilation systems that run either on thermostats or whenever the pumps are running, but a better practice is to run the ventilation system continuously. (I know many of us have entered a vault and found a trashcan or garbage bag full of the gunk maintenance personnel have removed from strainer baskets. This debris is often made up of leaves and other organic material that can decompose and reduce the oxygen content of a vault while creating gas by-products.)

Another common issue is the presence of chemicals in a vault. Chlorine and bromine are still the most popular water-sanitizing materials, and many methods and devices to deliver them are commonly in use. Trouble starts when

Interactivities

As mentioned in the accompanying text, interactive waterfeatures (or dry-deck fountains or deck-level fountains, as they are also known) have gained a high enough profile that they are now being regulated in at least two states.

By nature, these designs invite people to interact with the water, and the opportunity for the spread of diseases along lines similar to those encountered with public swimming pools has led both California and Florida to scrutinize these installations on the basis of health codes.

The deck system of an interactive fountain has always been subject to provisions of the Americans with Disabilities Act with respect to openings in the pavement (that is, no more than 1/2-inch gaps). In California and Florida, however, new state codes regulate the amount of water that is to be contained in the system along with the filtration rate and the level of the chlorine residual. In Florida, the code further specifies maximum exit velocities for nozzles of 20 feet per second.

Where municipalities require these interactive features to be sanitized with chlorine (as many now do), projects that involve the installation of equipment vaults are subject to the tangle of fire-prevention and worker-safety codes having to do with chlorine or bromine use in confined spaces.

Most designers see regulations of the Occupational Safety & Health Administration as a *future* issue and a workplace-safety burden that generally falls on the owner when it comes to ensuring that the environment that someone eventually has to work in will not pose a threat to health or safety. But the same rules apply to contractors and any personnel who go into vaults to assemble the equipment.

– D.S.

maintenance personnel store these chemicals in the vault.

To be sure, manufacturers of pre-fabricated vaults almost always advise against this practice, and some have even gone to the point of not offering certain delivery technologies as parts of their vault packages. That's fine, but maintenance personnel are notorious for doing what is convenient rather than what is correct.

At this point, yet another code authority enters the picture: the National Fire Protection Code (NFPC), which regulates the storage of hazardous materials including chlorine and bromine. And another: the Occupational Safety & Health Administration (OSHA), which addresses the handling of these materials in section 1910.176.

The product that is stored for use in the chlorinator is not so much of a problem as is material left in a feed unit over the winter or during long down periods (such as those associated with fountains in time of drought). If these systems are not properly maintained, they often fall into disrepair and can create hazardous conditions

WORKER SAFETY: The vaults used to house various arrays of fountain equipment are considered 'confined spaces' by the Occupational Safety & Health Administration, a fact that has led many vault suppliers to exclude chlorine-administering systems from the equipment sets provided for these vaults.

inside vaults. Chlorine gas is heavier than air, so if the ventilation system does a poor job or is poorly designed, the potential exists to have air issues.

For all these reasons practical and potential, fountain experts are always looking for other ways to sanitize the water in their watershapes. Chlorine and bromine simply offer too many challenges to successful long-term operation. (For a further twist on this issue, see the sidebar on interactive waterfeatures on page 40.)

No Shock Value

Finally, we come back to electrical issues and the NEC – the one code authority that has long been on record when it comes to fountains.

In section 680-51, NEC addresses acceptable voltages for underwater fountain equipment and provides for the use of ground-fault circuit interrupters (GFCIs). While this isn't the only part of the code that applies to watershapes, it's the only explicit mention of fountains. The rest of the code is generic for all submersible applications and covers everything from the correct wire or cable to use in submersible applications to how big a junction box has to be.

Taken all together, it is readily apparent that there's a lack of definition for fountain designers and installers when it comes to codes, regulations and standards. Yes, there is some guidance when it comes to interactive waterfeatures, but for the most part we're left to interpret many and sometimes conflicting codes in advancing our projects to completion.

I do not presume to call myself an expert on all of the codes that apply to watershapes, and my experiences in these areas as manufacturer, contractor and consultant have not always been very pleasant. I am by no means an advocate of government regulation, but I must say it would be a relief not to have to negotiate each project with each municipality as an individual case – and then live with some bureaucrat's interpretation of a tangle of codes to get the job done.

If you've found another way through the minefield, I am certainly open to suggestions – as is my Australian friend.

Regulatory Players

Here's a list of the code-generating agencies that set up an alphabet-soup challenge for fountain designers, engineers and installers faced with navigating a gauntlet to move a project from the drafting table to completion.

- The Americans with Disabilities Act (ADA) regulates access standards for people with disabilities. ADA rules apply directly to interactive waterfeatures with respect to openings in gratings, pavers and nozzles. They also require tactile warning strips on walkways next to reflecting pools.
- The Uniform Building Code/ International Building Code (UBC/ IBC) defines a swimming pool – a definition that, by extension, affects fountains. These codes also carry requirements for handrails; establish ratings of interior building spaces that affect the type of pipe being used (with respect to fire rating); and provide fire ratings for pipe penetrations through different fire-rated spaces.
- The Uniform Plumbing Code (UPC) defines connections of water and sewers to building systems and the requirements for backflow preventers and air gaps on backwash and drain lines.
- The National Electrical Code (NEC) defines requirements for lighting and pumping connections and defines bonding and grounding methods. NEC also dictates what types of conduit can be used, allowable lengths of exposed cables in fountain basins, maximum voltages and GFCI protection for personnel safety.
- The Occupational Safety & Health Administration (OSHA) is a federal agency responsible for workplace safety. OSHA defines confined spaces and air quality within those spaces, thereby affecting subterranean equipment vaults.
- The Environmental Protection Agency (EPA) is another federal agency and defines minimum requirements for the quality of recreational water. For the most part, this is a factor only when ponds or bodies of water may be used by the public for fishing or swimming.
- The Underwriters Laboratories (UL) conducts product testing and certifies electrical devices for applications in or around water.
- The National Sanitation Foundation (NSF) is a product-safety company that approves technologies for use in re-circulating water systems

In addition to these national agencies and organizations, those who would build fountains need to be familiar with the roles of numerous offices and agencies with local influence and the codes they use to govern activities on a local basis.

- State and Local Administrative Codes are now applied to swimming pools in all but two states. These definitions for swimming pools and associated building methods are interpreted by local authorities in evaluating fountain projects. In addition, some states are moving to codify the construction of certain types of fountains – specifically, interactive fountains.
- State Health Departments define the requirements for sanitizing water for swimming pools and will use those rules as a basis for regulating some fountain applications.
- State Fire Codes define the requirements for the storage of hazardous chemicals such as chlorine and acid – rules that can affect other building components such as fire-sprinkler heads (which must be chemical-resistant) and junction boxes (which must be explosion-proof) as well as ventilation requirements in equipment vaults where chemicals will be present.

– D.S.

Protective Measures

Always on the hunt for construction techniques and products that will benefit his work as a watershaper, Paul Benedetti has spent years examining and refining the way his firm stems the damage that weather and wear can impose on his highly customized, highly complex concrete creations. Here, in the second installment of a set of articles on installing durable hardscape, he offers his informed view of the science of 'fortifying' concrete.

By Paul Benedetti

Next to the water itself, concrete is the most important and widespread of materials used in watershaping. Not only is it instrumental in creating the structures that contain water as well as the substructures that support them, concrete is also the stuff of which faux-rock panels, pre-cast or poured-in-place coping, pavers, all manner of stamped or textured decks and poured-in-place or block walls are made.

Despite its omnipresence, however, concrete remains one of the most misunderstood of all watershaping materials in this sense: Because it is so durable in basic structural applications, there's a tendency to presume that the same durability extends to exposed concrete surfaces. In other words, once it is poured and troweled to the desired finish, most people have the notion that concrete does not require any ongoing maintenance. This, however, is yards from the truth.

In fact, concrete is just as susceptible to the ravages of heat, water intrusion, freeze/thaw cycles, staining and erosion as are stone-veneered decks, so it is just as important to take steps to protect these surfaces against such damaging influences. And the benefits of "fortifying" concrete run more than skin deep: Sealing concrete to prevent water intrusion not only prolongs the life of the structure, it also protects the internal reinforcing steel from corrosion.

Categorical Resistance

Many products can be put into service to waterproof and otherwise protect concrete. In sorting through the available materials, I find it helpful to divide them into five basic (and occasionally overlapping) categories: integral admixtures, curing agents, sealers and surface coatings.

Each class of products has its distinct functions, while each individual product has its own set of performance features and advantages. As a result, familiarity with the full range of product characteristics and capabilities is needed to match the right material to the appropriate application. You also need to factor in cost: Some of these products are outrageously expensive – so much so that they can become factors in planning and design decisions.

At whatever cost, however, I use protective products to enhance the performance and lifespan of my company's work and see both the cost and the labor as matters of working

For many of our jobs, we use an old-fashioned gunite rig that lets us put admixtures (such as fly ash, waterproofers, set retarders and more) directly into the mix while monitoring each batch. In the inset photograph, for example, we're adding an integral waterproofer to the gunite mix in proportions recommended by the admixture's manufacturer.

toward a higher standard of quality. It's also something we talk about with our clients by way of helping them appreciate the importance of protecting the investment they've made in their beautiful backyards.

As you'll see below, no single product suits all needs. In fact, depending upon the situation (and as is highlighted in the sidebar on page 48), you may end up using combinations of products to maximize the long-term performance of your work.

w **Integral Admixtures:** Most protectants are used on concrete after it has been applied, but admixtures go into the batch at the mixing stage.

In fact, admixtures must be specified when the concrete is ordered so they can "become one" with the concrete and be present throughout the structure. This is especially valuable in situations where you don't have access to the back side of the concrete after placement – as with pool, spa and fountain shells, shotcrete walls against hillsides and most decks, for example.

Most admixtures are intended to maintain structural integrity and extend the lifespan of reinforcing steel by preventing the corrosive "wicking" of water into the concrete. This is a particular plus when you work in areas with high ground water – including coastal regions, where the effects of saltwater intrusion can be truly catastrophic.

One of the original and most familiar admixtures is fly ash, which was first used by the ancient Romans. With its ultrafine particle size, fly ash acts as a pozzolan, meaning it makes the concrete denser and thereby less porous. Fly ash is still used by batch-concrete plants to increase the psi of cured concrete and is commonly specified in mix-design standards.

Other admixtures work in that same way, filling the capillaries within the concrete matrix as a way to prevent the intrusion of water. Some of these products, said to be "hydroscopic" in the presence of water, crystallize and grow throughout the batch in a chemical reaction with the initial mix water. Once the hydration process is complete and the water has evaporated, crystal growth ceases – but begins again if water is introduced, thereby stopping wicking or weeping on an ongoing basis.

These expansive-crystal products are by far the most expensive of concrete amendments, adding an average of $50 to $100 to a cubic yard of concrete. But for specific applications – in which they serve to ease, for instance, the installation of integrally colored concrete fountains by eliminating the need for an interior finish – the extra cost makes sense. The same holds true for fishponds, surge tanks, raised bond beams, planters and retaining walls.

w **Curing Agents:** These products are usually applied to freshly poured concrete to retard the evaporation of water. Most contain silicates (often sodium silicate) that aid in the formation of a denser surface and thereby slow the release of water through evaporation. They also usually contain dyes, which helps the applicator see where the product has been sprayed.

In terms of performance, there is some overlap between curing agents densifiers (discussed below), but curing agents serve a specific function: The American Concrete Institute (ACI) recommends their use because they force the concrete to hydrate from the inside and eliminate the need to "water" the concrete, a process that can cause surface discoloration and mottling while increasing the potential for other forms of surface degradation.

We follow ACI's advice for reasons of practicality: Using curing compounds eliminates our reliance on the property owner to wet down the surface subsequent to application, thus guaranteeing proper hydration (and strengthening) of the concrete.

We use care in selecting our curing compounds, as some contain whiteners or dyes. The compounds with whiteners are primarily designed for use by municipalities in pouring sidewalks or roadways. They turn the concrete white, which helps retard the effects of the sun

In some cases, multiple systems with the same purpose must be used to achieve desired results. Here, for example, the gunite was mixed with an integral waterproofing agent, but because the spa is to be finished with glass tile, we're taking the extra precaution of using an additional crack-control membrane/waterproofing system.

We apply curing compounds to freshly placed and wetted gunite with a simple sprayer, diluting the compound in water at the level recommended by the supplier. (The steel isn't stray, by the way: The bars rising above the beam will be used for tying off the poured-in-place coping this spa will eventually receive.)

and serves as a visual marker of where the compound has been applied.

As an alternative, we use a curing compound that contains a pink, UV-degrading dye on all of our non-colored concrete, stucco and gunite. The pink dye allows the applicator to see where the curing compound has been applied, ensuring even coverage. The color then fades away in a few days.

One big caveat: Do *not* use curing agents or sealers that contain wax if you are going to be applying any further surface coatings, stucco, stone veneers or plaster. The waxes will prevent proper adhesion!

For integrally colored concrete or stamped surfaces, we'll also use a family of curing agents known as "color cures." Most pigment manufacturers offer them for use with their products, and we have found that the application of these color-curing compounds on colored concrete has effectively minimized client complaints about color inconsistency. In addition, white "puddle stains" and efflorescence are practically eliminated.

w **Sealers:** These products are also applied after the concrete, colored concrete or an exposed-aggregate finish has cured and serve as a means of improving appearance, durability and performance.

These products are all primarily used to prevent staining and fall into two categories – *surface sealers* and *densifiers* – both of which offer protection against spalling, dusting, freeze/thaw damage, efflorescence, staining and salt damage. Sealers will also deepen colors, enhancing the appearance and lending richness and depth to the surface.

When selecting a sealer, look for one that is non-yellowing, contains UV stabilizers and provides superior protection from stains, grease and water penetration. In addition, seek one that can undergo future re-applications without extensive stripping or surface preparation.

Sealers come in two basic formulations: *waterborne* and *solvent-based*. As with the stone sealers discussed in the February 2004 issue of *WaterShapes* (starting on page 42), the solvent-based options for concrete sealing are being phased out of existence because they release pollution in the form of volatile organic compounds (VOCs) as they cure and present safety issues related to inhalation risks and ventilation. Given their toxicity, there's also a challenge to using solvent-based sealers around plants and grass.

The waterborne options are, accordingly, taking over in the marketplace. They are environmentally friendly, offer easy soap-and-water clean-up and don't release noxious fumes. Perhaps best of all, the application techniques are more forgiving and allow for quicker turnaround: If a subsequent coat of a solvent-based sealer is applied before the previous coat has fully cured – a period that can often take days – the finish will be subject to clouding or gumming. That's generally not an issue with quicker-drying waterborne products.

• The *surface sealers* sit on the surface of the concrete and form a hard shell. As a result, they are generally susceptible to traffic wear and require periodic stripping and reapplication.

These sealers are most often used for interior surfaces and lend a welcomed

gloss or sheen. Care must be used in applications around watershapes, however, because many of these sealers (especially the semi-gloss varieties) are slippery when wet. Yes, some suppliers offer grit additives to combat this shortcoming, but the grit wears away with the surface material and provides no long-term solution to the problem.

Some of the surface sealers can be used on both natural stone and concrete – an advantage we exploit as a means of reducing inventory and training, of gaining consistency in handling and application methods and of minimizing our count of pressure sprayers.

There are also products marketed as *concrete waxes*. These are designed primarily for indoor use but can also be used outdoors to enhance colors and deepen and enrich surface appearance.

• The *densifiers* are also sprayed on concrete that is already set. They typically contain an active ingredient (often sodium silicate) along with wetting agents that enable the active ingredient to penetrate the concrete surface to a depth of as much as four inches.

They do their work by seeping into the concrete and activating the lime and alkaloids within the cement in a chemical process that causes these unhydrated particles to "gel." The sprayed-on agents are generally inexpensive (at around $40 per gallon) and are easily applied using a fan-tipped bug sprayer. Once the gel hardens (typically in 60 to 90 days), the capillaries within the concrete are sealed.

As noted above, manufacturers of these products say that they can penetrate up to four inches. In going so deep, they displace impurities within the cement and sometimes push them to the surface. For the most part, these impurities are easily brushed away.

Densifiers are extremely useful when working with pre-cast concrete products – that is, those for which you do not control formulation. We use these products on pool and fountain shells, masonry and stucco walls, cultured stone surfaces and glass-fiber-reinforced concrete (GFRC) panels. It is also our practice to spray these densifiers on block retaining walls (which might also be filled with an integrally waterproofed grout). Densifiers also work wonders on brown coats to assist in preventing bleed-outs of free lime.

These products are typically applied after a curing agent is used – usually 30 days later. Once inside the concrete matrix, the active ingredients react with microscopic, unhydrated particles of cement to form a cement gel. When used on cured concrete, concrete block, old concrete, walls and slabs, the product results in a denser surface that resists the migration of water, vapor and even radon gas.

Densifiers have a tendency to push impurities to the surface – a big plus in that these products essentially displace staining material from the inside. While mineral impurities are easily removed, however, grease and oil will require degreasing.

w **Surface Coatings:** This method of waterproofing and otherwise protecting the surface of concrete involves the application of a coherent, topical membrane. These barriers fall into three primary sub-groups – elastomeric, clay and petroleum-based – and all are applied to the negative side of the wall (that is, to the side from which the water comes).

Each of these systems has its own distinctive characteristics, but from my perspective the elastomeric coatings have clear advantages.

• As the name implies, *elastomeric films* have elastic qualities – a big plus in the real world where things sometimes move. If a retaining wall develops a hairline crack, for example, the membrane will stretch across the gap and keep water from migrating through the fracture.

Elastomeric membranes can be rolled, brushed or (my favorite) sprayed on with an airless sprayer. They are water soluble, so cleanup is easy, and they require

In this case, waterproofing was accomplished by applying a pale blue elastomeric membrane directly to the inside of a fountain niche (A). Once the pipe perforations were sealed with hydraulic cement, we added a cementitious topcoat (B) as a bonding surface for the ultimate finish.

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Retaining Wall Basics

In many applications, we've found that combinations of multiple types of concrete protection produce the best results. A perfect example is with basic retaining walls.

Because concrete-masonry-unit (CMU) retaining walls essentially function as earthen dams, they require both surface protection and waterproofing. To that end, we start by pouring a footing that contains an integral admixture. The block is then laid up using mortar fortified with the same admixture.

Once positioned, the CMU blocks are filled with an admixture-fortified grout. Next, the wall's outward surface is treated with a penetrating densifier spray, while the reverse side receives two or three coats of an elastomeric membrane. If the front of the wall is to receive stucco or cultured stone, those finishes are also treated with a densifier.

Before backfilling, we wrap a rigid, four- or six-inch-diameter perforated pipe in filter-fabric cloth and install it at the rear base of the wall. The pipe is then covered with four to six inches of 3/4-inch rock that is covered in turn by filter fabric to prevent dirt and silt from clogging the rock. Finally, we ram-set a drainage mat on the reverse side of the wall to ease vertical drainage to the French drain. This mat eliminates the need for placing rock behind the wall as backfill is placed and protects any waterproofing system that might be applied to the wall.

– P.B.

There's a lot going on here, some of it not so easy to see: On the retaining wall, for starters, you can see the vertical drain mat and, at the far end, a wall section coated with blue elastomeric membrane. (As explained in the sidebar on page 48, the mat will protect the membrane during backfilling and compaction.) The vanishing edge wall has already been coated with the elastomeric membrane and a protective cementitious topcoat in preparation for plastering later on, while the gunite floor is white from the curing compound. All in all, it's a fairly typical case in which multiple products and materials are used to get the job done.

no special application skills. They do, however, have some drawbacks: They aren't UV stable, and they're also susceptible to nicks and tears from rocks of the sort used in backfilling.

To get around that fragility in applications where the membrane is to be used as a substrate for a tile pool, for example, manufacturers offer a cementitious topcoat that provides a bonding surface for brown coats and thinset. We have found that the topcoat on its own is also useful where a shell or wall is to be backfilled and will successfully protect the membrane from tears.

• Surfacing systems that use *clay* have been available for decades and have a proven track record, but they can be cumbersome and installers often have difficulty cutting and fitting the clay-impregnated panels or applying the clay emulsions.

The clay panels are applied against the surface to be protected and, as they get wet, the clay expands and seals off any moisture penetration. (Drainage mats, rock backfill and French drains are still required). The emulsions or powders are mixed with water to form a paste that can be applied by brush or roller, but the product has a hard time filling smaller voids and multiple applications (three or four) are usually required to ensure a complete seal.

• The *petroleum-based coatings* are similar to roofing tar or driveway sealants and are usually troweled or brushed onto the concrete surface. Once the petroleum solvent evaporates, the membrane stiffens and hardens with time and generally requires no special protection in backfilling. But this hardness becomes a problem in the long haul: If the wall ever develops a hairline crack, the membrane cracks as well.

Everything You Can

All of this concern about protecting and/or waterproofing one side or the other (or both) of structural or decorative concrete may seem to be overkill, but we look at it this way: It's a small investment of time and effort that helps both us and our clients avoid the frustration that comes if our work falls prey to any of the visual maladies that can afflict unprotected concrete.

You can't ever hope to eradicate the ravages of weather, time and usage, of course, but by using various combinations of the products described here, you can significantly increase your concrete's resistance

Resources:

The manufacturers of products for concrete waterproofing and protection include:

Carlisle Coatings & Waterproofing
Wylie, Texas
www.Carlisle-CCW.com/products/
(800) 527-7092

Degussa Building Systems
Shakopee, Minn.
www.degussabuildingsystems.com
(800) 433-9517

Enduro-Seal USA
Pinehurst, Texas
www.Enduroseal.com
(800) 259-8855

E.P. Henry
Woodbury, N.J.
www.EPHenry.com
(800) 44-HENRY

L.M. Scofield
Los Angeles
www.LMScofield.com
(800) 800-9900

Multicoat Corp.
Rancho Santa Margarita, Calif.
www.Multicoat.com
(877) MULTICOAT

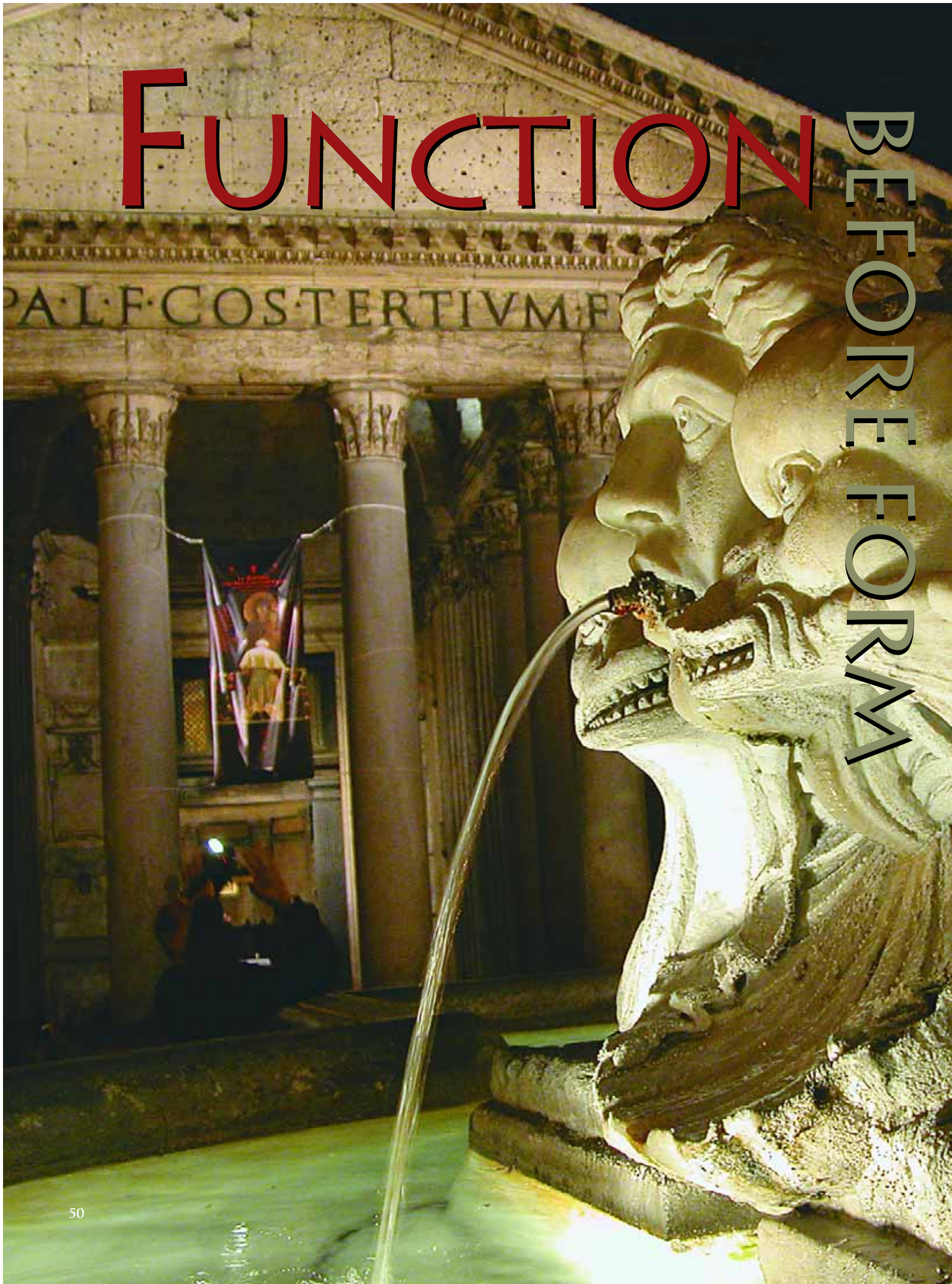
System Dynamics
Scottsdale, Ariz.
(800) 844-8514

White Mountain
San Leandro, Calif.
www.tricoat.com/whmnt/
whitemountain-products.htm
(888) 794-9960

Wicktek Inc.
Farmington, Pa.
www.Wicktek.com
(724) 329-8310

Xypex Chemical Corp.
Vancouver, BC, Canada
www.Xypex.com
(800) 961-4477

– P.B.


FUNCTION
BEFORE FORM

Late in 2003, landscape architect and watershaper Mark Holden set out on a personal mission to document some of Italy's most beautiful watershapes. From Rome to Venice, he observed glorious uses of water in courtyards and plazas filled with great artwork and beautiful architecture – and in this article takes us on a guided tour of some of those spaces with a discussion of how the work of these past masters still influences today's watershapes.

BY MARK HOLDEN

Have you ever wondered why watershapes are at the heart of so many venerable courtyards and plazas?

In a modern context, we might start answering that question by thinking about the natural human fascination and connection with water and then conclude that, like us, those who built the public spaces of ancient Mesopotamia or Athens or Rome simply liked being in the presence of water for emotional and spiritual reasons.

But the truth behind the prominent role of water in these spaces isn't as romantic as all that. Indeed, there's a far more practical answer that is easily overlooked by those who seldom need to take more than a few steps to gain access to a reliable supply of water.

The fact is, those ancient fonts and fountains in all those courtyards and plazas were once the primary method of distributing potable water. In truly ancient times, these fonts were wellheads or springs – little more than glorified hose bibs for the use of an estate or located at the center of public plazas where citizens congregated to water their horses and fill their ewers. In the centuries that followed, these spaces became grander and more elaborate, but until fairly recent times they still all served basic roles as much-needed private or public utilities.

Through Modern Eyes

In the fall of 2003 and for a couple of reasons, I took a long trip to Italy. My main responsibility was teaching a class on watershaping at a design school in Tuscany. My passion during that time, however, was visiting as many old watershapes as I could with the intention of recording what I saw and using the photographs I took as teaching tools and as a resource for articles such as this one.

As I traveled from town to town, I found that every major private or public space – universally – had a central core of water in the form of a fountain or wellhead. Back home, these watershapes would have been little more than eye candy in a shopping plaza or a place for kids to get wet. But here they had, for hundreds or even thousands of years, been sources of fresh water – functional utilities for their estates or towns and cultural hubs for the citizenry.

As I looked around, I gained a profound perspective on the evolution of the Western world's branch of watershaping from its roots in the practical necessity of making water available for mass consumption all the way through to its modern expression as a form of decorative art. By trip's end, it was easy to see why fountains, ponds and reflecting pools were so central a component in the landscapes of antiquity.

This placing of water at the core of urban design dates to the foundations of our Western civilization. Consider this: Just to function at its zenith, the city of Rome needed to have 9,000,000 cubic meters of water running through its water systems at any given time – far more than the River Tiber could supply, which is why the Romans became so adept at hydraulics and developed an aqueduct system that resulted in placement of all those fonts to deliver water to all those courtyards, public squares and plazas.

As time passed, these spaces took on huge social and even political significance. They were places of commerce, congregation, contemplation and communication – a grander equivalent, in many ways, of water coolers in modern offices.

As I traveled, I observed how Roman and Italian artists and architects began to decorate these utilitarian spaces. Almost all of the hundreds of waterfeatures I cataloged had the primary function of bringing water to the people, but it was easy to see how ornamentation emerged to overtake practicality in a way that in-

fluences the work many of us do today.

Whatever the shape of the space, it was water that dictated the order of things. In many instances, in fact, the decorative basins and/or statuary were added hundreds of years after the creation of the original watershape. The Trevi Fountain in Rome is a prime example of this evolution: Originally a simple outlet for the Aqua Virgo aqueduct, it has accreted statuary in stages since the days of the Roman Empire but only achieved its familiarly ornate form as recently as the 18th Century. And you need to reach all the way into the 20th Century before the fountain would lose its primary purpose as a public utility – albeit a magnificent one.

Current Affairs

This impulse to "dress up" water sources may fold this discussion back to our natural, modern, emotional answer to the question that kicked off this article. Water is so special a commodity that it is natural to surround it with attractive ornamentation and give symbolic nods to our connection to life's essence.

But there's something else at work that isn't terribly spiritual: The ability to supply water, to bring it where it was needed (rather than making citizens take their buckets to rivers and streams) is a profound statement of power – not only for the Roman Empire and the builders of the aqueducts but also for the Renaissance princes who fortified their city/states and provided their citizens with the water they needed to survive and thrive.

Those same princes and powerful elites extended the metaphor of power to their private estates, villas and residences, showing anyone who approached that they, on a personal level, had the power to bring water where they wanted it to be rather than live at the unpredictable will or whim of nature.

This all may be difficult for us to comprehend in America, where our oldest cities are just a few centuries old and urban centers grew up with the benefit of long-established water-distribution practices. The watershapes I saw were many times older than that and were mostly still functional (in many cases with a great deal of maintenance and reconstruction).

Main text continues on page 55

The original purpose for just about any plaza or courtyard font was simple: take water from a remote source and bring it safely to where it is needed. That raw, unadorned, utilitarian function is still seen in these simple spigots, one from Siena (A), the other in Venice (B). In other examples shown in this article, this artless functionality has been wrapped in decoration from simple to sublime.


C


E

Whatever impulse drove the 'bulking up' of wellheads and spigots into substantial urban structures or exactly when that transition deliberately occurred, it's plain to see that fonts in some locations eventually came to be seen as less utilitarian, more architectural and even a bit decorative. In Bologna (C), Florence (D) and Castiglion Fiorentino (E) among many possible examples, in fact, we see aesthetics intruding where utility had once been sufficient – but in ways that don't compromise that utility in any way.

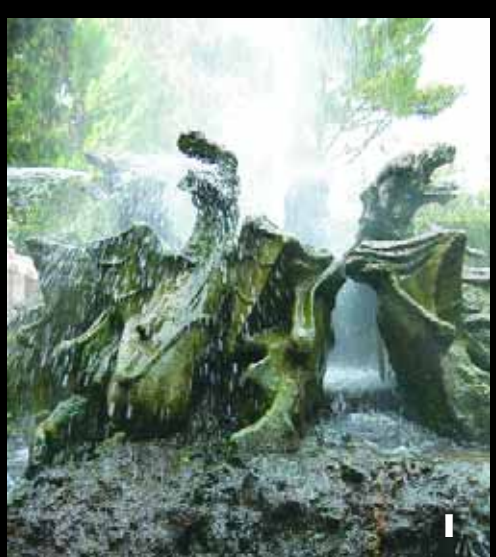

D

F

From the Renaissance forward, Italian designers displayed a reverence for Roman mythology and imagery that worked its way into a tremendous amount of civic art, including this plaza fountain in Bologna (F). The fountain statuary's celebration of the human form may seem a bit outrageous by modern American standards (G), but these symbols of fertility and fecundity were meant to express the natural riches of the city and the reliability of its water supply – a utility still served for any thirsty person who approaches the fountain.

G

There have been occasions in Italian architecture and design where the need to water livestock and supply potable water took a clear backseat to decorative impulses – none more obvious or elaborate than Villa d'Este, the private residence of a powerful 16th-century Cardinal that stands as a fantastical expression of the potential water has to decorate and shape open spaces (H). If there is any functionality here, it is masked rather completely by a sense of water that is excessively and exclusively on display (I).



If you strip away all the ornamentation from Roman and Italian fountains (and there are still plenty of fonts that have a plain, functional appearance, as some of the photographs seen here testify) and reconstruct the history and evolution of those watershapes, it's plain to see that "function" preceded "form" – and that this concept has been all but lost in today's urban watershapes.

Once modern infrastructure robbed them of their ancient purpose, watershapes in public spaces morphed into a form of public entertainment as purely decorative marvels. While there's a well, cistern, spring or basin buried somewhere beneath the vast majority of Roman or Italian fountains in courtyards or plazas, very few American fountains have such practical underpinnings.

In modern times, we've taken our drinking water and funneled it though a series of hidden pipes, filters and sani-

A TRIP FOR THE EYES

My primary reason for traveling to Italy was work: teaching a class at the Santa Chiara Design School in Castiglion Fiorentino. The school is a haven for students and teachers from several American universities whose interests cross many design disciplines. I had been asked to expound on the role of water in environmental design – and where better to do it than in Tuscany?

The Tuscan countryside truly is amazing. While it is superficially similar to California and specifically to California's Central Coast region, there's a consistency to the beauty here that enriches the experience and makes so many of the settings unrivalled and unforgettable.

The most striking feature of the rolling hills is the number of hilltop castles around which so many of the Tuscan cities have grown. The stone, brick, wooden and plastered buildings of these towns are arranged in patterns around central cores – most of which, I might add, are piazzas that still have their decorative wellheads or ornate fountains, mostly in good working order.

– M.H.

J

K

Rome was and is Italy's wellspring of power, administration and civic development, and the full range of possible outlets for water can be found around the city, from the simplest to the most elaborate. This control of water, a hallmark of Imperial Rome's technology and enterprise, was tightly embraced by Renaissance princes and popes who wanted to associate with a glorious past. A case in point is this fountain sculpture, where the top draws on ancient myth (J) but the support structure below the shell is emblazoned with the papal crest and symbols of the powerful Barberini family (K). Elsewhere in Rome, even the plainer fonts take on a large scale and have aspirations to monumentality – but still retain a clear sense of functionality (L, M).

L

N

No matter how humble or grand a water source might be, it's refreshing to be reminded that fresh, potable water in any form is a good thing, even for pigeons (N). In fact, we should stand in awe of those who moved water across Italy in days long past, sometimes over great distances, to places where it is needed. Water is indeed a tremendous civilizing force, and we as watershapers, whether we appreciate it or not, stand in the tradition of those who made possible the emergence and growth of cities as centers of population and power.

tizing units. For the most part, even pool hydraulics are hidden behind walls five feet tall. Rather than celebrate the way these systems work, we have systematically hidden them – and have been heading in that direction for centuries beyond count.

Finding Inspiration

What endures is the water itself. Even seen in purely decorative terms, it still commands attention in exterior spaces, just as a vase of cut flowers will make a strong interior statement at key household intersections. Both reside at the crux of a critical axis, and both limit our ability to walk or reside or intrude on that key intersection. In other words, the water has always been the key – and more important than any individual in the history of design, including all of us.

I've often seen it written in the pages of *WaterShapes* that travel serves a vital role in broadening our perspectives and opening our eyes to alternative worlds of ideas and inspiration. I may even have done so myself on a couple of occasions, but the fact that it's not an original idea with this article does nothing to diminish the importance of the concept.

I have been fortunate in my formal and extended education and in my affiliation with a range of creative people within the trades to be able to pursue my interest in understanding the origins of watershapes and watershaping. I have seen this as a means of elevating my own performance, and I have come to believe as well that a basic understanding of this long, ancient and honorable heritage is one of the keys to elevating both our art and our industry.

M

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135	Cantar (pg. 60)
136	Advanced Control Logix (pg. 60)
137	Pool Thing (pg. 60)
138	Jandy (pg. 60)
139	Keystone Retaining Wall Systems (pg. 62)
140	Most Dependable Fountains (pg. 62)
141	S.R. Smith (pg. 62)
142	Suntrek (pg. 62)
143	Artistic Paver Mfg. (pg. 63)
144	Aqua Ultraviolet (pg. 63)
145	Neptune-Benson (pg. 64)
146	ITW Devcon (pg. 64)
147	Emerson Motor Technologies (pg. 64)
148	WESCO Fountains (pg. 64)

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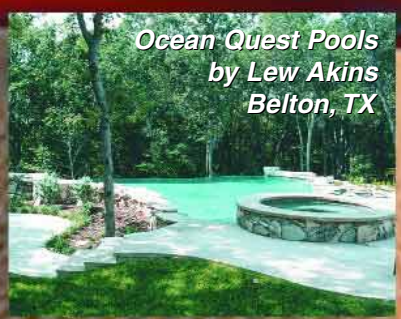

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ADVANCED CONTROL LOGIX introduces AWDX, a high-intensity, medium-pressure UV technology designed for pools and spas. The disinfecting system uses ultraviolet radiation to treat the water without producing any undesirable color, odor, taste or chemical presence – including the chloramines that can cause eye and nose irritation – all while offering savings in operating costs. **Advanced Control Logix**, Colfax, CA.

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POOL THING offers an electronic sanitizing device that kills microorganisms, bacteria and algae in swimming pools and spas without the addition of chemicals other than common rock salt. The device mounts to the return line after the filter; as water flows by the electrodes, salt is turned into chlorine that is compatible with all known pool surfaces at a level adjusted with the turn of a dial. **Pool Thing**, Scottsdale, AZ.

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JANDY has introduced the NeverLube backwash valve. Designed for use with the company's DEL48 and DEL60 filters, the unit has a special coupling that allows for easy installation on most brands of D.E. and sand filters. In addition to a full-flow port for optimal hydraulic flow, the CPVC valve also has a seal that never needs lubrication and is resistant to temperature and chemical fluctuations. **Jandy**, Petaluma, CA.

Continued on page 62

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UV Systems for Ponds

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AQUA ULTRAVIOLET offers UV-sterilizing systems for ponds. Designed for outdoor use with UV-resistant housings, the units are designed for vessels with up to 17,000 gallons of water and feature single-end lamp installation for easy service. They can also be set up with wipers that keep the systems' quartz lamp sleeves clean and efficient. Systems for much larger vessels are also available. **Aqua Ultraviolet**, Temecula, CA.

Continued on page 64

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NEPTUNE-BENSON has published a four-page, full-color brochure on its line of accessories – recirculation equipment, structural components and control systems – for swimming pools, waterparks and aquatic features. Coverage includes strainers, valves, drain boxes, frames and grates, recessed steps, access hatches and ladders, water-level controllers, CO2 feed systems, filters and more. **Neptune-Benson**, West Warwick, RI.

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MOTOR CATALOG

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EMERSON MOTOR TECHNOLOGIES has published Bulletin SP101, an all-inclusive, 44-page catalog covering its extensive lines of residential- and commercial-duty pump motors. Profiled products range from 1/200 to 4,000 horsepower and are marketed under a variety of brand names, including Emerson, Doerr, U.S. Electrical Motors, Hurst and more. **Emerson Motor Technologies**, St. Louis, MO.

WET/DRY LANDSCAPE LIGHTING

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WESCO FOUNTAINS has introduced a high-intensity landscape light that can be used aboveground to illuminate shrubs and trees and can also be used in or near fountains as perimeter lighting or to illuminate shooting streams of water. Made of Ryton PPS thermoplastic, the 120-volt fixtures use 50-, 35- or 20-watt halogen lamps and can be set up in circuits of up to 30 lamps. **WESCO Fountains**, Nokomis, FL.

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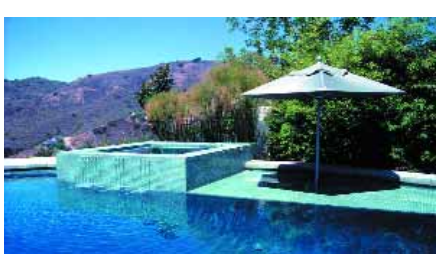

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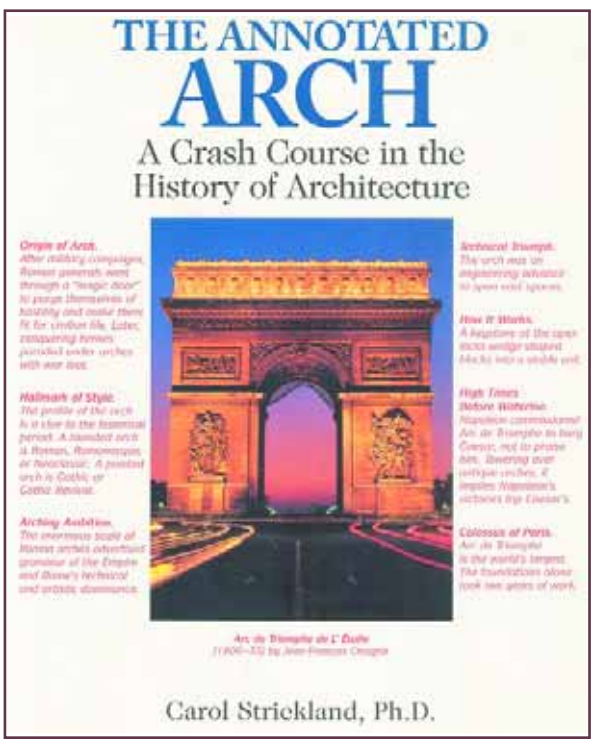
By Mike Farley

Thieves of History



I don't know who first expressed it, but I've always welcomed the notion that "great designers are great thieves." That nugget rings so true because very few among us ever have *completely* original ideas and, in fact, the best designs are generally derivative of something that came before.

To my mind, if some degree of larceny is part of our game as watershape designers, then one of the very best places to find borrowable ideas is a book entitled *The Annotated Arch* by the historian Carol Strickland (Andrews McMeel Publishing, 2001) – a wonderful and inspiring 180-page, beautifully illustrated book that offers a concise and insightful tour of the history of architecture in ways that are always engaging and often entertaining.

Organizing discussions by major periods of architectural design and construction, she covers a tremendous amount of ground beginning with ancient landmarks from Stonehenge to the great Pyramids of Egypt and the buildings of Mesopotamia, ancient Greece and the Roman Empire. The text moves fluidly through the Middle Ages and Renaissance on up through the 20th Century.

Along the way, the book is loaded with brief sidebars that explore not only the development of such basic technologies as the arch, dome and flying buttress, but also set a context with historical anecdotes that define the wellsprings of these ingenious innovations.

There's a wonderful passage, for example, that discusses the work of Florentine architect Filippo Brunelleschi – a seminal figure in Renaissance architecture – and the challenges he faced in building scaffolds to span the width of the domes and copulas he was commissioned to create for basilicas and cathedrals.

These well-considered sidebars are woven throughout the text, resulting in a treatment of history that hits the high points while putting a human face on the times and works of the great masters.

A great deal of attention is paid to the fact that governments and churches have been responsible for creating many of the world's greatest buildings. There are also examples of how the design tools available to architects shaped the works they did – a thread that concludes in later chapters with discussion of the advent of computer-aided design systems that have made possible many of today's most innovative structures.

One of the best things about this book compared to others I've read on the subject of architectural history is its inclusion of truly modern architecture. Indeed, Strickland spends a full third of her book on the 20th Century, and I was fascinated to read up on Julia Morgan and the way she used history and salvaged materials to create Hearst Castle in central California.

There are wonderful discussions of many modern masters, all the way from the organic masterworks of Frank Lloyd Wright to the wildly adventurous works of Frank Gehry. Here, we see how these modernists combine a superb sense of architectural history with new technology and a true spirit of innovation to create contemporary works of architectural art.

If you're like me, you find reading most history books a chore rather than a pleasure. With all its keen insights, historical tangents and interesting anecdotes, however, this book is a shining exception. Certainly, there's no substitute for actually visiting great buildings to gain inspiration, but for the thief in all of us, books such as this one offer a wonderful way to case the spectrums of influence out there – and borrow ideas just waiting to find their ways into the great works of tomorrow. WS

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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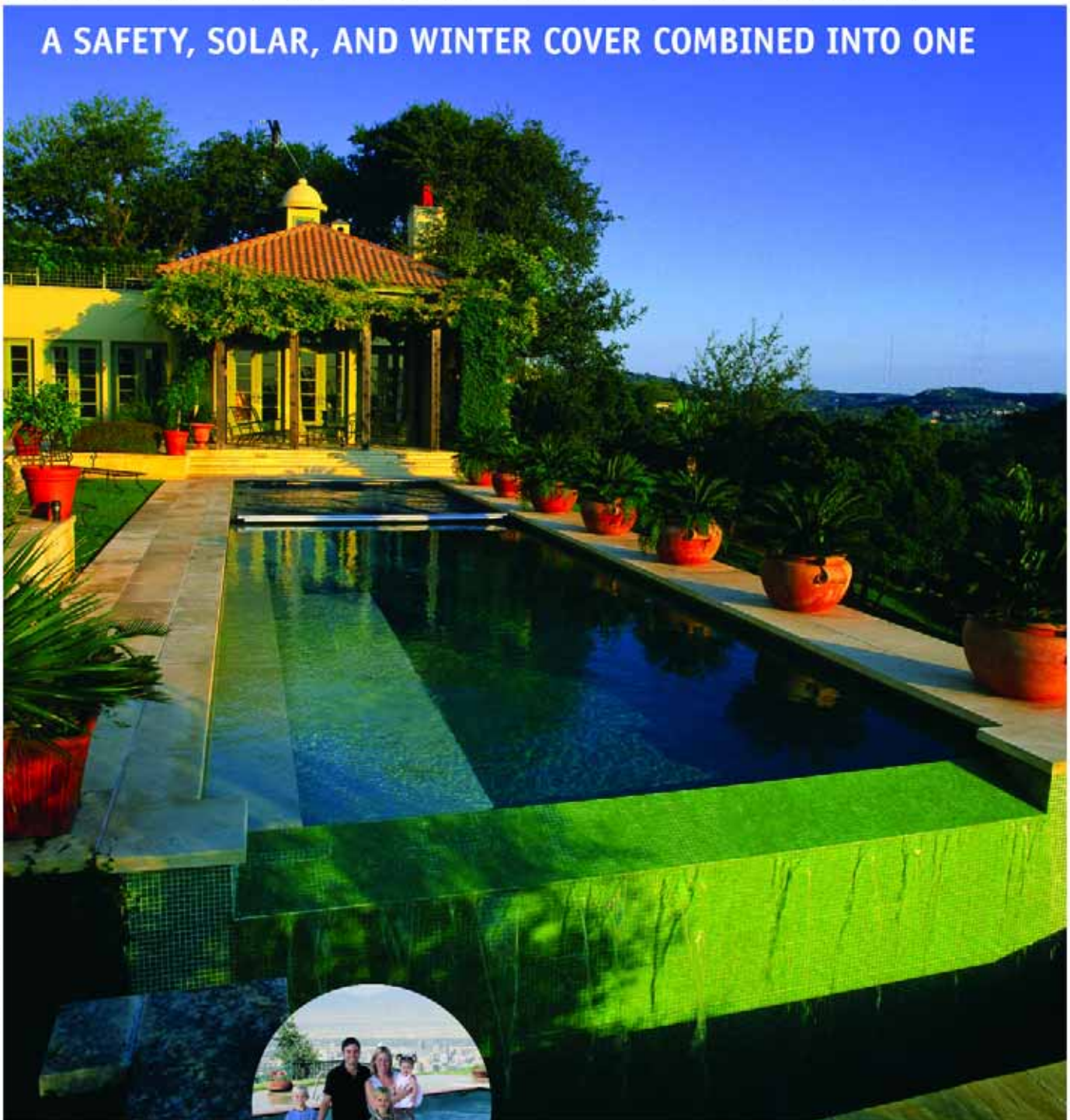

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