

Inside: Stephanie Rose on Small Spaces

# WATER SHAPES

Design • Engineering • Construction

Volume 5  
Number 5  
May 2003  
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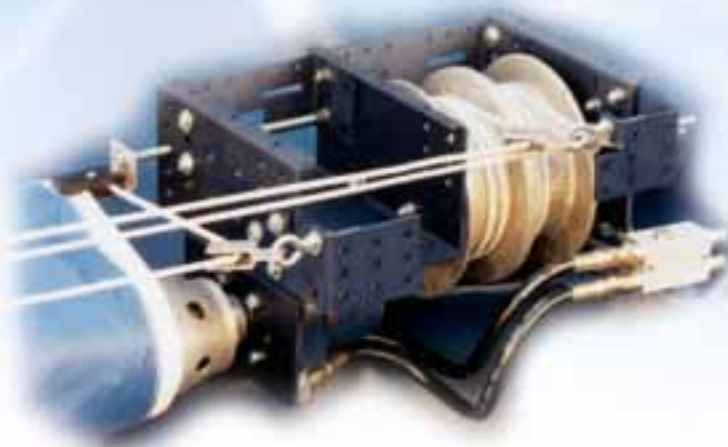
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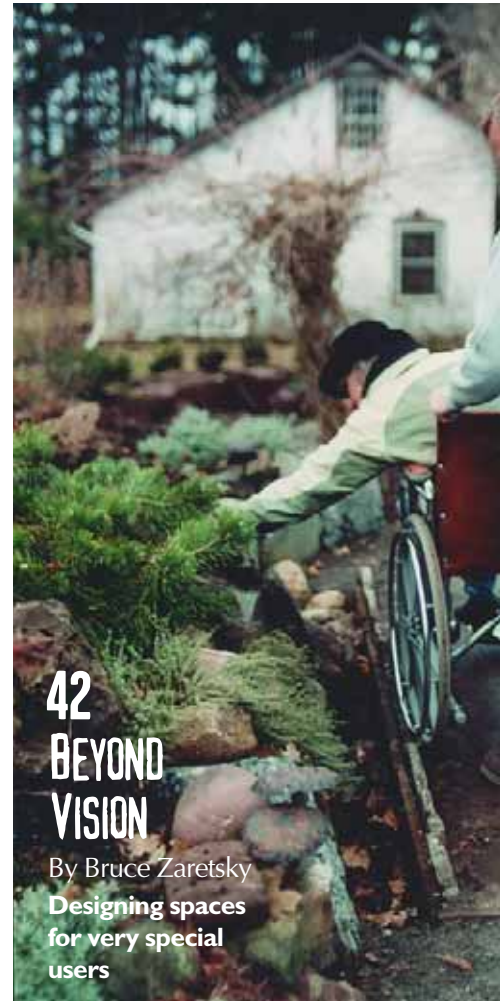
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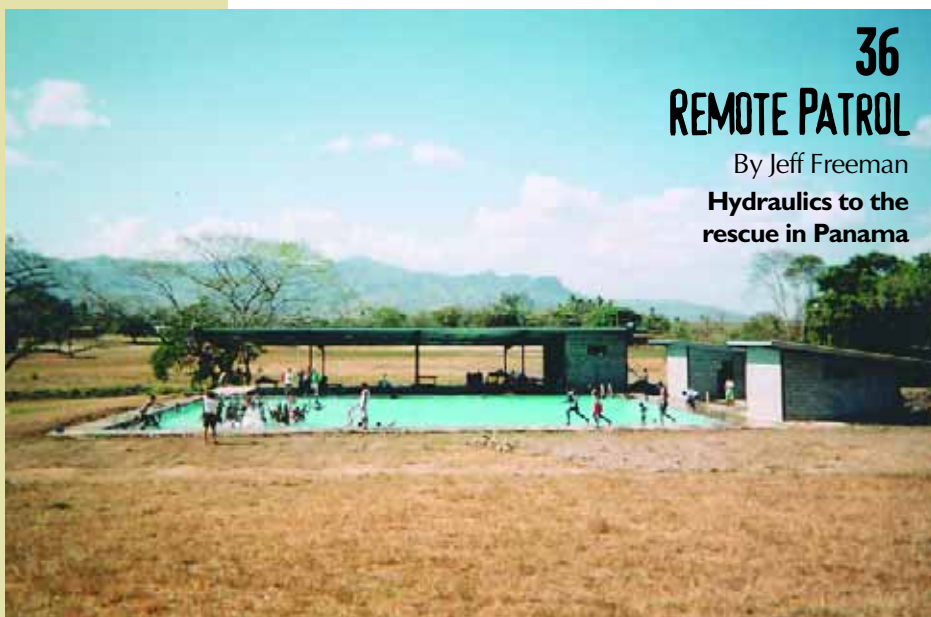
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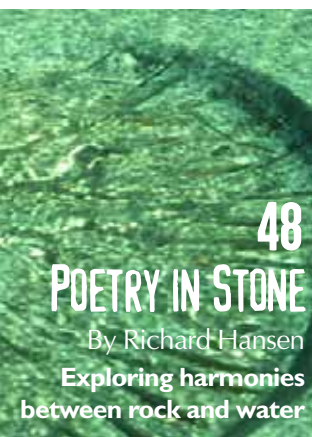
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On the cover:

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## POETRY IN STONE

By Richard Hansen

**Exploring harmonies between rock and water**



## Places To Remember

I've heard it said that even though the greatest stories may require only a relatively few words in their telling, their meanings can echo through generations. On page 30 of this issue, you'll find a concise article that covers a beautiful watershape and landscape that is designed to tell just such a story.

In "An Edge of Honor," landscape architects Johannes H. Wagner and Eugene R. Bolinger describe the creation of the Massachusetts Vietnam Veterans Memorial, a place where the citizens of the Commonwealth have chosen to honor in perpetuity their service personnel who died in Vietnam.

It's a somber space, a place where a sprawling memorial is organized around a body of water. And in many ways, theirs is a simple story of how water can function as a metaphor – in this case for the Vietnamese landscape – and as a powerful aesthetic element lending a space a sublime sense of tranquility and beauty that leads to both physical reflection off the water and a deeper sort of psychological reflection most fitting to such a space.

Speaking from my own background and experience, it's impossible for me to ignore the greater meaning of this article and the space it describes. My dad, Richard Herman Jr., served in Vietnam as a navigator in the Air Force's C-130 transports and flew more than 200 combat missions. He was highly decorated for his efforts and, luckily for me and my family, came home after the war.

Although his service is a distinct point of pride within my family, there's no question that our shared experiences during his duty in Southeast Asia transformed our lives forever.

I won't go into the specifics other than to say that I can imagine, especially given the nature of current events, that those of you who've served in the military yourself or who've had a family member or a loved one in the service, may find resonance in this story that reaches beyond its immediate and stirring context.

\*\*\*

On a decidedly different note, and speaking as one who spends a great deal of time communicating with people throughout the watershaping trades, it seems this industry is holding its own at a time when others are taking it on the chin.

Over and over, I hear reports from people who say they're working harder than they ever have to keep up with the demand for well-designed, well-engineered, well-constructed watershapes. I've heard this from people in the pond and stream industry who are saying the same thing as pool and spa people and folks in the fountain and fine arts corners of the watershaping trades.

Frankly, that's remarkably encouraging given current economic conditions, and I'm curious to know if what I'm hearing lines up with your own experience. If you have a moment and a thought you'd like to share, don't hesitate to send me an e-mail ([eh@watershapes.com](mailto:eh@watershapes.com)).

If the stories are as interesting as I suspect they might be, I might take the opportunity to share some of your responses in an upcoming column or two.

*Eric Herman*

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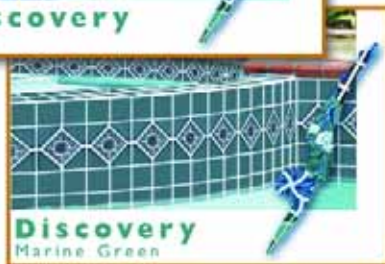
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**Johannes H. Wagner & Eugene R. Bolinger** are associates at Weston & Sampson Engineers, Inc., a 103-year old environmental and infrastructure-engineering firm based in Peabody, Mass. A registered landscape architect and decorated Vietnam War veteran, Wagner has more than 35 years' experience in landscape, architectural and environmental design. Bolinger is a registered landscape architect with nearly 20 years' experience in managing landscape design projects throughout New England.

**Jeff Freeman** is director of commercial sales and technical director for Eco-matic, a manu-

facturer of chlorine generating systems based in Newport Beach, Calif., and is also founder of Fluid Logic, an independent hydraulics-consulting firm in Upland, Calif., that specializes in complex aquatic systems. He entered the watershaping industry more than 20 years ago, working for a wholesale distribution firm. He later established his own service and repair company, then returned to the distribution business as a product representative working with swimming pool and spa builders. He has extensive experience designing and troubleshooting hydraulic systems and has taught the subject at the California Polytechnical University in Pomona, Calif.



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*Interested in writing for WaterShapes on design, engineering or construction topics? Contact Eric Herman at (714) 449-1996!*

**Bruce Zaretsky** is president of Zaretsky & Associates, a landscape design/construction company in Rochester, New York. Since starting in the landscape design industry in 1979, Zaretsky and partner Sharon Coates have become nationally recognized for their creative and inspiring landscapes, gardens and watershapes in projects ranging from the smallest residential spaces to sweeping landscapes. They emphasize designing and installing healing and meditation gardens for health-care facilities, nursing homes and hospitals.

**Richard Hansen** is a sculptor and associate professor of art at the University of Southern Colorado in Pueblo. He earned a bachelor's de-

gree in fine arts at the College of William & Mary in 1971 and his masters in landscape architecture from the University of Colorado in 1985. He has served as a visiting artist and lecturer at the Rhode Island School of Design, the University of Illinois, the University of Minnesota, Colorado State University, Iowa State University, Kansas State University, the University of Kansas, and the Illinois Institute of Technology's Italy Program. Hansen has designed and installed projects throughout the United States. His public output has been the subject of a variety of exhibitions and retrospectives, and he has traveled extensively throughout Europe and Asia studying and teaching art history.



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### Giving Credit

I wholeheartedly agree with Ken Simpson's letter regarding David Tisherman (Letters, January 2003, page 12). The arrogant, condescending tone of Mr. Tisherman's articles has no place in a serious industry magazine. His articles read like marketing material for his firm.

Despite the impression he offers, the vast majority of pool builders are not complete idiots who have no concept of design. Sure, many of them may not be able to talk about Le Corbusier's contribution to the field of architecture or about color theory,

**There are a lot of great pool builders out there doing terrific work.**

but they have skills needed to design and build remarkable pools.

There are a lot of great pool builders out there doing terrific work, and one only needs to look at any of the pool industry's design award competitions to see great designs and quality work being done by builders across the country.

**Josh Montgomery**

*Assured Aquatech Pools  
Hawaiian Gardens, Calif.*

### Outside the Box

In the past year, I've had first-hand experience in working with David Tisherman on a handful of his East Coast projects. Although we had never met before I first stepped on site, his reputation preceded him. I knew his expectations were high, but so were mine.

The stakes are indeed high on Mr. Tisherman's projects, but I was no newcomer to high-dollar jobs. And after all, he had done his homework in hiring me, as I had done mine in deciding that I would personally run the job site so I could make certain everything went smoothly.

I didn't know what to expect in installing his finishes for the first time. I had never combined textures and palettes of color the way he wanted me to, and I was awestruck by how incredibly it all worked together. I couldn't get the job off my mind, and I found myself talking with everyone I met about how incredible it looked.

My ego and enthusiasm went in a ditch when the order came down: "Rip it out!"

There was nothing to talk about. It wasn't what Mr. Tisherman wanted, and he told me point blank that it

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would come out again if it wasn't right the second time around. Did I need this? In the heat of a very busy season, when a contractor can pick and choose among projects, did I need this? Everything I'd ever known told me to tell him to find someone else, but this little voice inside me kept asking, "Do I really measure up? Do I have what it takes to impress someone who really knows his stuff? Not a dabbler in design, not some self-proclaimed concrete guru, but someone who intends to reinvent the industry every day?"

Was I worthy of being hired by the best of the best? I had to know, so I bit my lip and decided to keep an open mind.

A bit later, Mr. Tisherman contacted me about installing more of his trademark finishes, but the descriptions he offered weren't enough for me to visualize things fully enough to think I could meet his expectations. We decided it was time for me to come out West, where I could see and touch the finishes he wanted. One of my stops was at the "Splashes of Color" pool, and I was inspired. Everything worked, everything had purpose, and the space didn't just look good. In fact, it seemed that he understood a dimension of color beyond the visible and how color makes us *feel*.

The red plaster created the most vibrant water I'd ever seen. The purple retaining walls provided form and function – a point of reference like the frame around a picture. The infamous Crayola tile was set with thick grout lines and abutted a lawn that made the edge anything but dangerous. The green-concrete decking added overall interest in both color and geometry. The falling sheets of water added movement to the canvas of colors, and I now knew one thing for certain: Mr. Tisherman had created a work of art.

As is the case with all art, the "Splashes of Color" pool is subject to individual interpretation. I think Mr. Simpson's interpretation focused on individual components of the job when,

in reality, it is the sum of all those components that reveals the true genius in the project.

I, for one, eagerly await the emergence of more doses of Mr. Tisherman's Western philosophy here in the East.

**Chris McMahon**

*Architectural Concrete Design  
Levittown, Pa.*

In our April 2003 issue, page 10, we reproduced an engineering plan without crediting the firm that created it: Mark L. Smith Architecture & Engineering, a specialist in pool engineering based in Tarzana, Calif



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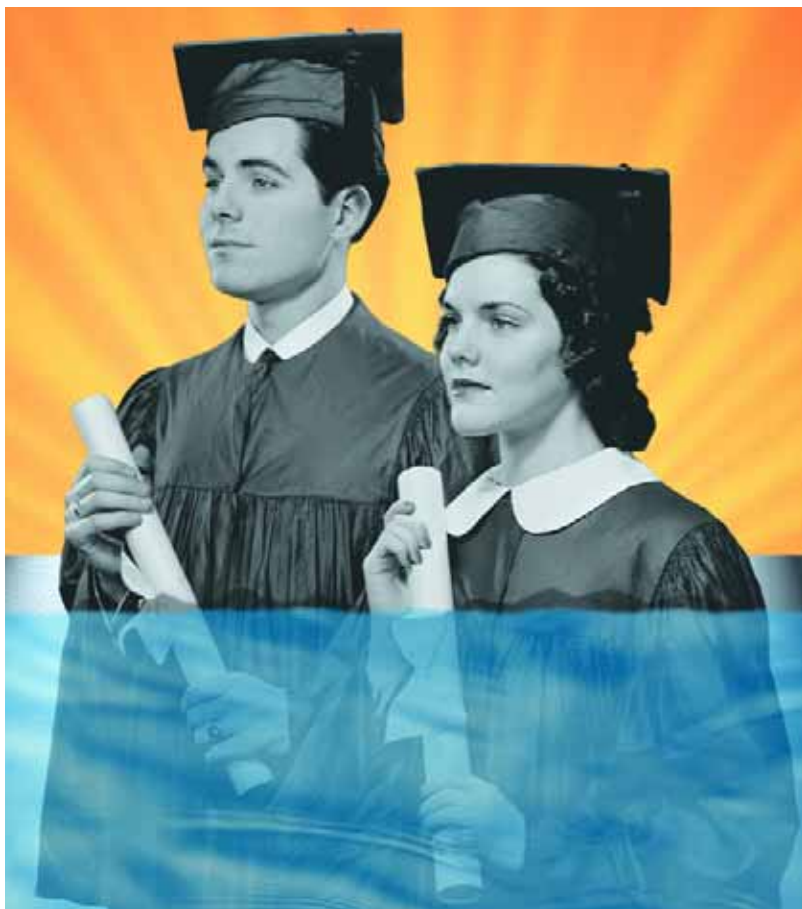
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## We Can Do Better

**D**uring a presentation to a recent conference for the swimming pool and spa industry, I tossed this nugget to the audience: “By a show of hands, how many of you in this room believe that most people think highly of our industry? Please be honest.”

It was a mixed group of more than 160 people representing manufacturers, distributors, manufacturer’s representatives, retailers, service/maintenance firms and, in the majority, pool and spa builders. Even with all of these different segments of the industry in the room, not a single hand went up.

As one who often criticizes the industry, even I was surprised by the response. So I asked if they thought that most folks had a generally negative view of the pool industry – and nearly every hand shot up.

This diverse group of industry professionals was united in the belief that most of the public thinks poorly of professionals on the pool/spa side of the watershaping trade. Looking around the seminar hall, somewhat amazed by the group’s apparently unanimous low opinion of the industry’s image, I

**It’s unfortunate that there’s no formal education available in the field of pool design and construction – no degree program at any design school, no credentialing system of any sort.**

posed what I believe was the next logical question: “How can we do better?”

### The ‘E’ Word

For years now, I’ve been among those who support the idea that the first and most potent answer to that question has to do with assigning far greater value to quality education. I wish I could say otherwise, but this position is now so common that it’s becoming somewhat of a cliché.

Trouble is, even though many of us are in agreement on the need for education, it doesn’t change the fact that it’s tough to quantify exactly what we mean by “quality education.” As a result, where it’s quite easy to ramble on and on in praise of education, it’s definitely another thing to make it happen.

In all fairness to the pool and spa industry, there are countless seminars that teach the basics when it comes to water chemistry, running a retail store and to some extent about issues related to design, engineering and construction. The problem is that too much of this information is delivered in incredibly small doses (typically in one- or two-hour seminars) that give important topics a once-over-lightly treatment that may do more harm than good.

And in the worst cases, the short time frames lead to communication of a tremendous amount of information that is just plain wrong – and gets repeated over and over again at conference after conference, coast to coast.

It’s unfortunate that there’s no formal education available in the field of pool design and construction – no degree program at any design school, no credentialing system of any sort that recognizes the need for anything more than stepping over the exceedingly low barriers to entrance into the profession.

Continued on page 14





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To fill the void, organizers of a great many industry events where seminars take place are constantly looking for volunteers who will teach a course on one relevant topic or another. The people who raise their hands and lead a seminar are certainly well meaning, but are they truly qualified to teach what they're being asked to teach? Who evaluates approaches ahead

of time? Who sets the standards?

The reality is that the standard for educational quality has been set very low in most places. As a result, we see the industry reinforcing, for good or ill, lessons it has learned over and over again rather than stepping back and looking beyond itself to find new ideas and information. And, regrettably, we sometimes see erro-

neous information doled out as gospel. Without pointing fingers, I know that this scenario arises all too often.

## Finding Answers

Getting away from this haphazard, inconsistent and undisciplined form of education was one of the motivating factors in forming Genesis 3's design schools, and the fact that most of those schools have been sold out during the past five years testifies to the fact that they have value. I'm proud of that fact as one of Genesis 3's founders, but even I acknowledge that our schools are only first steps on a much longer road to a better education and a better industry.

To indulge a daydream for a moment, try to visualize an industry where water-shaping is a field of formal, academic study with full-time instructors, a rigorous curriculum and high standards.

That's quite a stretch beyond where we are today, but ultimately, I believe that's what it will take to elevate our trade to the next level. And if you consider the not-too-distant profession of landscape architecture as a parallel, I believe that taking some steps in the here and now toward establishing a program in watershape design and construction at a major design school is important to the trade's future.

We shouldn't be satisfied by two hours of information on structural engineering, two hours on hydraulics, two hours on the history of art and architecture and an hour on lighting. Instead, we should find ways to encourage development of programs in which key courses last for months rather than hours, completion of which results in a degree or some other form of reliable, respectable credential.

Over time, I think, the legitimacy that flows from such programs will translate into an improved self-image among all segments of the watershaping trades – to a better way of doing business, and, finally, to greater acceptance among consumers.

Certainly, this sort of prospective discussion leaves little for us to grasp in the industry we see today. As a result, I believe we still need to press on and ask ourselves how we can do better right away, beyond anything that might develop on the educational front.

Continued on page 16

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## AQUA CULTURE

In other words, it's not enough to say that educational opportunities are poor, so there are no reasonable ways for us to elevate our profession. Instead, to move in a direction where customers are drawn to people in our trade rather than repelled by them, we need to make smaller, incremental improvements on an individual, daily basis.

The most immediate thing we can do, I think, is to begin by improving the way we treat our customers. This is something we can each start doing with the next prospect we encounter.

### People Skills

Here's a specific example of how something could have been better:

I have a long-time friend from the wine and food industry who recently hired me to design a pool for his family. I always enjoy working with friends and was happy to tackle the project, which, by most standards these days, was a relatively ordinary backyard pool/spa combination. To my friend, completing this project was a hugely exciting prospect.

The design phase was easy, but when it came time to recommend contractors, things became tougher because, quite honestly, I don't have a great deal of confidence in many of south Florida's pool-construction companies. Out of necessity, however, I can and do offer limited suggestions.

In this case, unfortunately, my client ran into a couple of truly rude people who almost immediately soured him on the process. In one case, the contractor was abrupt, saying he'd pick up the plans and specifications if he had the time – and did so in a way that was utterly dismissive of my client and of the fact that he had employed a designer to make that set of plans and specifications.

I'll admit this rubbed me the wrong way, partly because it was a friend who was being treated so rudely, but also because this is far too typical of what I hear from clients and potential clients all the time: People in our industry tend to be rude and inconsiderate and, by the way, are horrible about returning phone calls.

As my friend told me (and as others have related to me in the past), this rudeness so early in the process foretold terrible things for the rest of the process. If behavior is so unpromising before the



contract is even written – during the “honeymoon” period – then how is it going to be when problems arise? The next question many of these prospects ask is, “Do I really want to put myself through this?”

In this case, my friend moved forward – and he did so because our products are so attractive and desirable that people are willing to tolerate, with noses held, the process of dealing with our industry. Put another way, our products are so cool that they sell despite our best efforts to ruin customers’ good moods during the sales and construction processes.

To my mind, this is not difficult to fix. All it takes is a concerted effort to be nicer, more considerate and more professional in demeanor – a pathway to immediate rewards. And you don’t have to be highly educated (or even all that intelligent) to be kind to others. It’s my belief, in fact, that we can go a long way toward making up for other shortcomings by treating people in a positive and considerate way.

### Scaling the Growth Curve

If that sounds overly simple or even naïve, so be it. Frankly, I’ve seen common courtesy work wonders, over and over again and in myriad ways.

The challenge is, while professional courtesy yields clear results, it’s an intangible – and nobody can tell you how well you’re treating your clients except for those clients themselves. They’re the ones who know for sure, and they’re the ones you need to take care of in order to stay in business.

As I walked away from that seminar room, my mind working to encompass the low self-image with which the industry regards itself, it occurred to me that it would be interesting to ask the consuming public to rate us on a scale of one to ten. My guess is that we’d have to grade on a curve to give out more than a few good marks: On a straight, objective scale, I’m convinced we’d fare pretty poorly – and certainly well below “average.”

In considering how we can do better, there are things that we can do collectively, by continuing to beat the educational drum, but there are many more things we can do individually, by elevating our daily approach to our clients and treating them with professional respect and courtesy.

Either way and on any level, the deci-

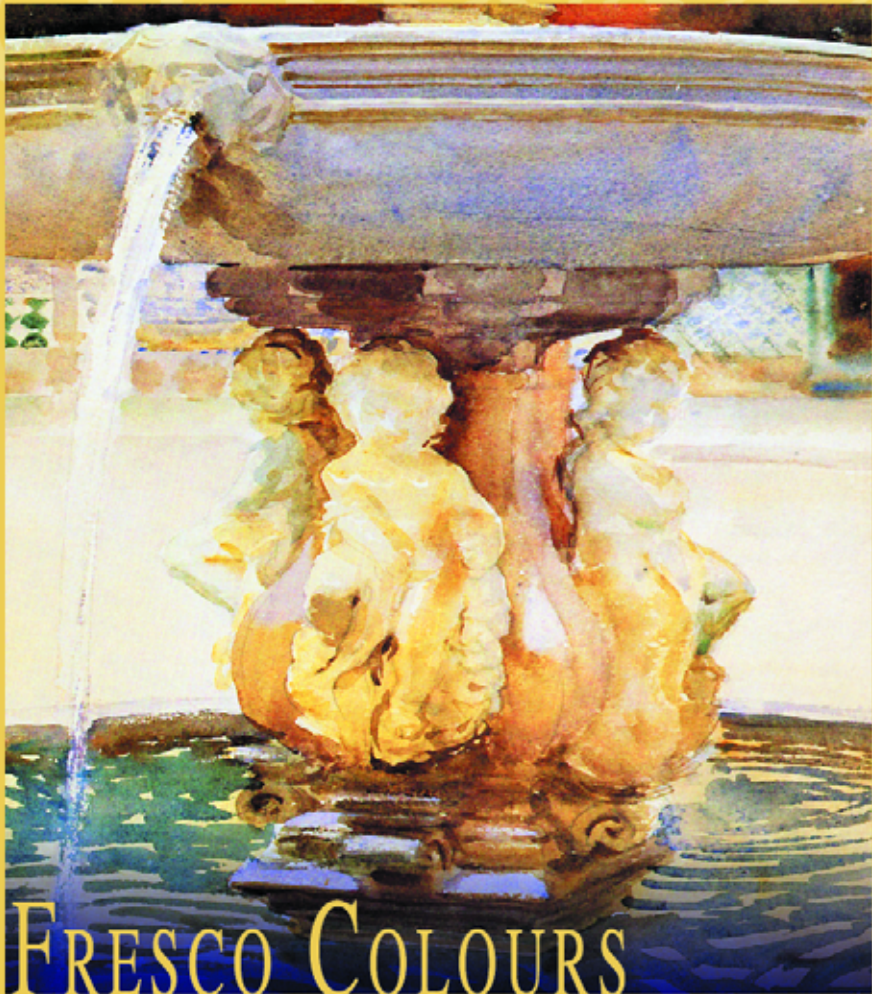
sion to do better begins with the acknowledgement that something is not right and needs to be improved. I believe the participants in my recent seminar had identified a need for improvement – a fact that gives me some hope. **WS**

*Next time, we’ll turn our attention to some specific things we all can do better.*

**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](mailto:bvanbower@aol.com).





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## Considering Small Places

Whenever I receive a call for an initial meeting about a potential project, I always envision – before the client ever opens his or her mouth – that I will be adorning a multi-acre estate with a classic garden that will someday be written about in books and examined by landscape students throughout the world for generations to come. Doubtless, this call will be about the project that will bring me both fame and fortune!

Now back to reality.

Although there are plenty of large-scale landscape projects to be had, the smaller projects are much more plentiful. And they are often, as I have found, just as (if not *more*) demanding of my creativity – and just as satisfying to my clients and me. As the maxim has it, “Good things come in small packages” – and I truly believe this is so when it comes to small garden spaces.

### Meeting Needs

My appearances on “The Surprise Gardener” might make it seem as though I specialize in small projects. A typical show takes a small yard or space and transforms it in the course of a day into a paradise of a sort the homeowner never dreamed possible.

Although there are plenty of large-scale landscape projects to be had, the smaller projects are much more plentiful. And they are often, as I have found, just as (if not *more*) demanding of my creativity – and just as satisfying to my clients and me.

Actually, this is only a tiny part of what I do, but I find that my show projects make me operate with a discipline that has led to good outcomes in my other projects.

Most of the design projects I tackle in my business are in fact quite involved and certainly require more than a one-day effort. So as I await that huge estate job, I find that designing in small spaces allows me to be both specific and focused in my work.

Where a large space typically has many components and calls on me to spread a variety of ideas throughout a yard in service of a defining theme, I find that with smaller-scale projects, my planning must be much more deliberate and carefully considered. In other words, in small spaces, concepts and design elements have to be specific, because in smaller spaces, things that don’t work or go together are that much more apparent.

The sorts of spaces I’m thinking about here are small patios, the areas surrounding spas and ponds, atriums and other confined places. To demonstrate what I think about when I encounter these spaces, let me use the area that property owners often refer to as their “side yards” by way of illustration.

Most houses I encounter in southern California have these spaces because they are placed relatively closely to one another, with about six feet of clearance between the home and a wall or some other property barrier. Often, these areas are used to house trash enclosures, storage sheds or dog runs – all excellent uses of narrow spaces. We do not, however, need to confine our design thinking to such drab, utilitarian purposes!

A narrow space of just six to ten feet, for example, can easily handle a hedge or some softer visual barrier against the adjacent property. When it fits the style, I’ve used bamboo, constructed decorative walls and fences, planted low-lying hedges and used vines trained on wires to cover over-ly plain barrier structures.

The possibilities here are indeed endless, my point being that this type of design often requires careful planning and consideration of all the parameters of the space, from views

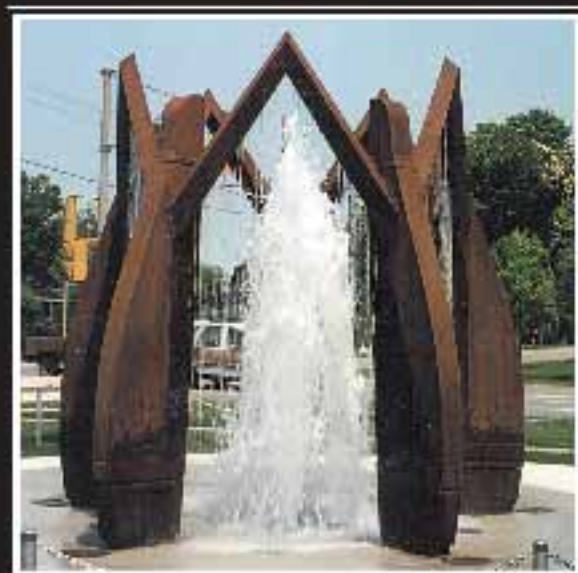




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and planned uses to anticipated levels of traffic through the narrow available passageways.

## A Little Larger

What happens when you're asked to design a space that may be a little wider than the usual side yard but that still functions as a throughway or is used, for ex-

ample, to house pool equipment or air-conditioning condensers? It's simple: You just get more creative.

Once I was asked to look at a property where the homeowners wanted to rework the front yard but weren't quite ready to do anything in back because they couldn't figure out yet what they wanted. The front, they told me, was to be a nat-

**I saw the proximity to the dining room as an opportunity to create a visually beautiful garden as well as a functional one.**



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ural landscape incorporating herbs, vegetables and other edible plants – mainly because they missed the kitchen garden they'd had back home in Australia.

The trouble with their vision was that the front yard didn't have enough area that caught full sun for a long enough time during the day to nurture an edible garden. Also, the range of larger plants they pictured out front wasn't conducive to edibles: Once those plants matured, they would create a canopy above the edibles and completely block the sun.

To meet their desires, I turned to the side yard, which at the time was being used as a dog run. The space, about 40 feet long and 13 feet wide, received full sun through much of the day and seemed an ideal space for a kitchen garden. The one possible drawback was that the space was right outside the carpeted dining room, and they didn't want to encourage traffic to flow that way.

But I saw the proximity to the dining room as an opportunity to create a visually beautiful garden as well as a functional one. My suggestion was to create a formal space that would open up a beautiful view through both the living and dining rooms' windows – and that would most easily be accessed through the backyard and, specifically, through the kitchen door that led out to the backyard.

All the requirements and desires for this working garden pointed to a formal style. We also needed to create access from the gate to the front yard and from the pool area in the backyard, which led us to develop a pathway through the center of the space.

To that purpose, we started with a decomposed granite walkway down the center of the side yard, leaving about a five foot bed on either side of the walkway. This made everything in the space readily accessible. With the basic grid





By the time we finished, a small, nondescript side yard had become a formal projection of the homeowners' dining room – and the kitchen garden they'd wanted to remind them of their lifestyle at home in Australia.

established, I began suggesting some key formal elements, including a fountain and planter.

The homeowners wanted it all. The side yard soon included a central pathway with two circles dividing the pathway into thirds. The circles would be large enough to hold the fountain and planter, respectively, with ample room for passage around them on either side. This fit right in with the dimensions of the proposed flanking planters and still gave us a three-foot-wide walkway.

### Great Selections

With the form established, we then moved to the task of filling the garden with plants.

The main requirement was to fill the space completely with herbs, vegetables, fruits and any other kinds of edibles they might be inclined to use. The only ornamental plant we selected was dwarf mondo grass – *Ophiopogon japonicus* 'Dwarf Kyoto' – which divides the planter beds diagonally on either side of the walkway into 42 separate plots, each plot housing a different edible plant.

The plant palette included four types of basil, strawberries, chives, scallions, three types of thyme, a variety of seasonal lettuces, three types of sage, borage, rosemary, seasonal herbs, carrots and radishes, among others. We were also able to fit in six dwarf citrus trees: two Satsuma tangerines (my personal favorite), one Mexican lime (a very small, thin-skinned fruit with lots of juice), two Meyer lemons and one kumquat.

The irrigation was designed to keep moisture away from the house as well as the decomposed granite path to the greatest extent possible.

The fountain was a particularly wonderful addition to the design, offering the gentle sound of water reflecting off the property line wall and flowing into the living and dining rooms when the windows are open. The raised, circular planter is filled with plants that now drape over the edge and are watered by a drip-irrigation system.

This small-scale design fulfilled this family's need for homegrown edibles and the flavors of the Down Under lifestyle they'd left behind. They invited me to dinner one night, and I was pleased to see that all the organic items served with the meal had been picked directly from their own kitchen garden. **WS**

*Next time: Another "think small" project that turned an arid, unused side yard into a serene Japanese-garden-style retreat.*

**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](mailto:sroseld@earthlink.net). She also can be seen this season in six new episodes of "The Surprise Gardener," airing Tuesday evenings on HGTV.

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## The Jet Set

If you've been following this column for the past several issues, you already know a good bit about the magnificent (and magnificently difficult) project I completed late last year in the Malibu Colony. Many times in those columns, I mentioned (mostly in passing) a system of four deck-level laminar jets we planned on installing.

As was the case with just about everything else on this project, incorporating the system of jets into the courtyard environment turned out to be far more complicated and challenging than we ever thought it would be. When all was said and done, however, we all agreed that meeting this particular challenge was more than worth the effort: The jets, manufactured by my friends at Toronto's Crystal Fountains, absolutely complete the scene. Best of all, the clients agree and are thrilled.

There were points along the way, however, where that outcome seemed completely out of reach. Indeed, the ultimate success of the project is attributable to

**I recognized that these particular clients had both the resources and the adventurous spirit required to pursue something truly special with the project.**

the fact that my clients and I were treated to some of the very best the watershaping industry has to offer, courtesy of thoughtful, detailed participation by an assortment of suppliers.

Here I'll conclude this sequence of "Details" with the story of these sensational waterfeatures and the professionals who made them come together.

### Command Performance

Way back when I first started discussing the project with my clients – well before we had any idea of the odyssey that lay before us – the husband told me that he wanted the pool and spa systems to be set up in such a way that they could easily be updated and upgraded to accommodate new technologies that might eventually become available.

This was true in all areas – filtration, pumping, heating, alternative sanitization, pH control, remote control and visual effects – and meant that we ended up installing numerous extra plumbing runs and conduits of all sizes to meet all possible (and unspecified) future needs.

Recognizing that these particular clients had both the resources and the adventurous spirit required to pursue something truly special with the project, I suggested that we should consider something far out of the ordinary. His interest was piqued, and I shared with him what I knew about laminar jets.

In his case and with other clients, I typically describe laminar jets as a system that pushes a tightly controlled stream of water over distance, creating the illusion of a piece of bent acrylic tubing illuminated



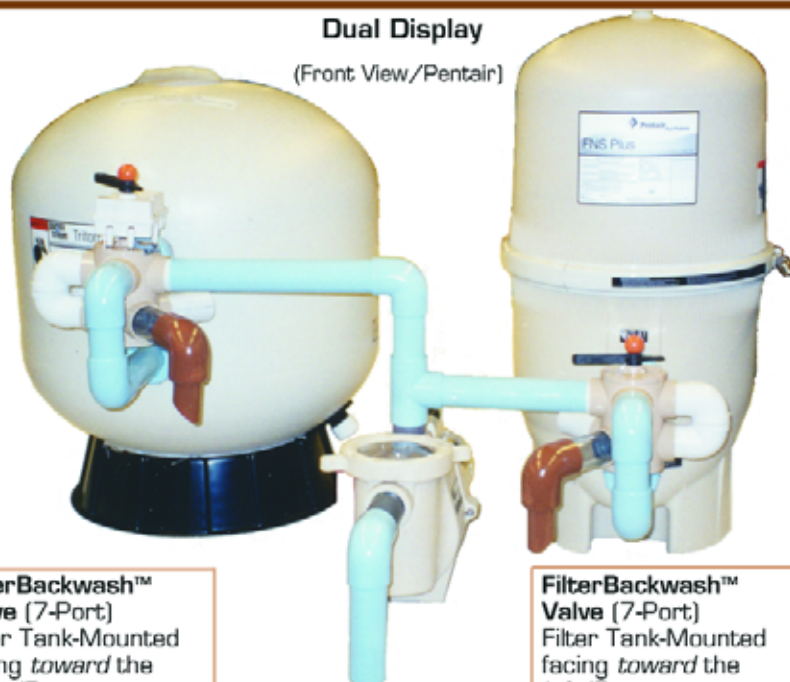


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(Right Side View/ Pentair)



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by a hidden light source. My client was fascinated and wanted to know how a stream of water could bend without breaking up – not to mention how the water would essentially “encapsulate” light within the smooth, laminar stream.

I won't go into details of surface tension and the subtle optical effects at work here. Instead, suffice it to say that seeing is believing and that the upshot of my conversation with the client was my organization of a grand demonstration. The client was ecstatic, and it proved to be a win-win situation for everyone involved.

In fact, far from being an imposition, organizing the demonstration and coordinating among a diverse and far-flung set of suppliers led to one of the most satisfying experiences I've ever had with other professionals in the watershaping trades.

In setting things up, I contacted a number of people who needed to know what was going on because all of the water-shape's systems would eventually be integrated to varying degrees. As a result, in

addition to Paul L'Heureux of Crystal Fountains, I called Steve Gutai and Ron Soto of Jandy and Pentair's Steve Zorn, asking them to join me at my studio to mock up a system with a laminar jet, a remote control and a fiberoptic lighting system.

Later, we carted everything up the coast to the clients' courtyard, and it was quite an evening from start to finish. I was floored by the professionalism and level of cooperation among my fellow demonstrators. Also on hand that evening were Robert Jechart of pool-safety-system supplier SonarGuard; Kerry McCoy of Pineapple Pools, the service company that handles all of my start-ups; and a couple of guys from the magazine business – *WaterShapes*' publisher, Jim McCloskey, and its editor, Eric Herman.

### On the Deck

The idea here was not to sell any particular product, but to give the clients some idea of how a certain effect could be achieved and what it would look like.



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tray set in place using the special T-shaped keys and the assembly ready for placement of sod and bluestone, the boxes are about to disappear into the checkerboard deck.

For all the hassles of coordinating so many people, I wish I had more opportunities to work this way: It's really something special to see a gathering of smart people working together to show open-minded clients something spectacular – a wonderful collaboration that brought the best together to work at the highest level.

In a matter of just a few minutes, we'd set up the system on the deck and fired it up. On perfect cue, a flawless stream of water arced from the deck to the existing pool, and it really couldn't have gone more smoothly.

Even so, my clients had a mixed reaction, one of them seemingly ecstatic and the other obviously quite a bit cooler to the idea. I won't explore the interpersonal dynamics of their decision-making process other than to say that I was asked the next day to go ahead with the jet system.

Last month, I described how, over time, the courtyard's deck took shape. Through that convoluted process of design iteration and reiteration, we always knew that the project would include four laminar jets, mounted in the deck at strategic positions relative to the radiuses of the pool's

edge; that each jet would be illuminated with its own fiberoptic cable; and that the entire composition would be driven by a high-tech microprocessor that would control the jets, fiberoptics and low-voltage pool lights.

Frankly, the system was to be unlike anything I or the folks at Crystal Fountains had ever seen on a residential pool. They

developed the software and control system, for example, using technology they typically reserved for their high-end display fountains.

What all the technology meant is that these four jets would be capable of doing all sorts of engaging things: They'd be able to change colors in sequence or in unison, for example, or move in sequence

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## DETAIL 27

or be staggered with respect to stream height and length to create various visual and auditory effects. They can even do "the wave," rising and falling in order from end to end, changing colors as they go.

This is truly fun stuff. There are now lighting programs for Christmas (red and green), Halloween (orange) and the Fourth of July (red, white and blue) as well as action levels from the raucous to the serene. It's a complete backyard water show – and some very serious bells and whistles!

### Adaptive Behaviors

Naturally, everything we hoped to accomplish with the laminar jets was complicated by the changing deck design. As mentioned last time, we weren't at all sure whether the jets would be mounted within a field of stone or grass.

In fact, it ended being *both* by virtue of the checkerboard pattern the clients ultimately decided they wanted. But nobody knew that at the time we were setting up all of the sub-grade conduits, pedestals and boxes that would support



The deck was laid out in such a way that the laminar-jet boxes aligned absolutely perfectly with the grid-work for the checkerboard. With some final adjustment of jet angles and distances, the whole decorative scheme of the project was at last falling into place.



the laminar jet system.

We had to get started in some direction at a fairly early point in the construction process, however, so I contacted Paul L'Heureux, explained what I thought I wanted and my thoughts on how it might be done. By the time we were through, we'd agreed that the project would involve a set of four, custom-designed, stainless steel boxes that would have special trays that could be set up to accept either grass or stone, depending. Paul's staff engineered and fabricated the boxes, built the jets, did preliminary work on the control systems and offered detailed schematics of how the whole assembly would work on site.

Long before all of the components arrived, we'd stubbed conduit and plumbing to the jet locations. A large portion of this preparatory work took place after we'd partially backfilled the courtyard to a level about 30 inches below the coping. (If you'll recall, the original excavation had been much more extensive to enable us to address some severe structural challenges facing the home, pool and deck.)

We set specific locations relative to the edge's contour and built concrete pads – each consisting of approximately a third of a yard of material to ensure absolute stability – to act as sub-grade pedestals for the boxes and their contents. This is an important point: That's a lot of concrete to support what are, after all, just 30-pound boxes, but we took no chances with the possibility of settlement or incidental movement because of the importance of a stable base in ensuring the long-term, consistent performance of the laminar jets.

Each position has plumbing for the jets and separate conduits for AC power and low-voltage communication lines that run back to the master computer modules in the garage, with multiple Jandy systems; the fiberoptic illuminators set up on an outside wall on the opposite side of the house; and the circulation controls we placed in an old trashcan shed we'd covered and converted into an equipment area.

As I've mentioned before, I rely on a hand-picked set of subcontractors I trust implicitly, and it is situations such as this one where they really show their stuff. In this case, my electricians, Russ McFadden

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and Chuck Succa of Pacific West Electric; my wonderful plumber and friend, John Rodriguez of Rodriguez Pool Plumbing; and my favorite mason, Kenny Palmer of KC Palmer Construction, all did an amazing job of following Crystal Fountains' specifications to the letter.

### Making It Work

With the pedestals, conduits and plumbing in place, Crystal Fountains sent a team of technicians to install, adjust, balance and debug the system. Our hope was that this process would take just a few days, but that was not to be the case: The problems we ran into during the system's set-up phase were substantial, and the process that we hoped would go quickly ended up stretching out over several nerve-racking weeks.

It was the client, an electrical engineer by training, who had predicted that we were heading into rough terrain: Early on, he mentioned to me his belief that whenever you're dealing with customized

computer-controlled systems, if something can go wrong, it will.

His prophetic statement came indeed to painful fruition. There were problems with power surges, software glitches, tricky system interfaces, radio-frequency interference and a crop of other issues that seemed to emerge on an almost daily basis. It was amazing: Whenever we'd solve one problem, another would arise just in time to take its place.

It was frustration we didn't need at the tail end of a project that had already become drawn out and had often been staggeringly difficult.

During the process, however, I became usefully aware of just how complex and intricate fountain-display systems can be. In that respect, I offer the strongest possible caveat to anyone who may want to move down this path: This is no place for the novice, and the level of precision, patience and all-out effort required to make such delicate systems work effectively and efficiently is utterly remarkable.

For example, simply testing the system was a challenge because, for one thing, we had to wait until nightfall and, for another, the pool wasn't yet filled with water. What this meant beyond long hours in the field during a long summer is that we had to set up (and later empty) trashcans in the pool to catch the laminar flows and avoid interfering with the process of tiling the pool.

We went through this trashcan drill dozens of times over many, many occasions by the time we were through. And there were days that stretched from the crack of dawn into the late evening as we tested, adjusted and retested the systems.

Through it all, my respect and admiration for Paul L'Heureux and the staff at Crystal Fountains grew by leaps and bounds. Yes, there were unforeseen problems and a couple of serious impasses, but they stuck with the program and never wavered in their commitment to finishing the job and making it absolutely right.

The good news is that everything worked

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The technology behind the laminar-jet system is truly awesome. There's enough microprocessing power in these panels to run a light show and water display at a major amusement park – and, as can be seen, an amazing scheme of conduit and cabling that makes it all work.

out in the end. Once all the problems were solved, the system worked perfectly – and the outcome is nothing if not sensational.

As important, and as you'll see in an upcoming feature article that will bring coverage of this project to a grand close, the laminar jets fit in within the entire design scheme as though the whole thing had been made to order right from the start. As I look back on this project now, with a little bit of distance, it's satisfying to know that for all of the trials and tribulations on this project, the result is a beautiful watershape in a spectacular setting.

Isn't that what we're all after? **WS**

**David Tisherman** operates David Tisherman's Visuals, a design and construction firm based in Manhattan Beach, Calif., with offices in Marlton, N.J. He is co-founder and principle instructor for Genesis 3, A Design Group, which offers education aimed at top-of-the-line performance in aquatic design and construction.




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# An Edge

By Johannes H. Wagner & Eugene R. Bolinger

It unfolds as a serene and inspiring space, as a solemn and symbolic tribute to self-sacrifice and the anguish of war: The Massachusetts Vietnam Veterans Memorial in Worcester's Green Hill Park had been a labor of love and devotion for decades by the time it was completed and dedicated in 2002, say the project's principal landscape architects/environmental designers, and proved to be worth every bit of the effort required to make it happen.

# Honor

**The** site was chosen because the existing water, terrain and natural landscape were a perfect fit: Like no other available space, the design team saw that this setting could be used to symbolize the character of Vietnam's landscape – wetlands and bogs, water crossings, hills and forests, meadows and plains – and shaped into a memorial to casualties of a war that ended in Southeast Asia nearly three decades ago.

It's a beautiful and peaceful space, one that now encompasses four acres of land around the perimeter of Duck Pond, a small and scenic body of water nestled in the gently rolling landscape of Worcester's Green Hill Park in central Massachusetts.

Some 20 years in the making, the Massachusetts Vietnam Veterans Memorial required a sustained public effort and the commitment of local citizens, business leaders and politicians alike. The process may have been difficult, but the result is a tribute of solemnity, beauty, appropriateness and historic significance to the Commonwealth's citizens.

Our firm, Weston & Sampson Engineering, was called on to provide the landscape design and to oversee construction – and has been honored to be involved from the project's inception in the early 1980s. As was true of so many others who became involved

in the long process, we were thrilled to see the vision for this memorial finally come to fruition.

## The Program

As conceived, the memorial includes three important spaces: "Place of Flags," "Place of Words" and "Place of Names," all situated at or near the shore of Duck Pond.

Visitors enter the memorial site through Place of Flags, a fieldstone-and-wood arbor planted with climbing hydrangea. From this vantage point, they look across Duck Pond to see the massive granite monoliths at Place of Names in the distance.

Just a few paces east of the gateway, visitors enter Place of Words to view a set of four granite monoliths that stand on land and in the water and have been engraved with excerpts of letters written to loved ones by soldiers who fell during their tours of duty in Vietnam.

The monoliths are situated on both land and in water to symbolize movement through the landscape and everyday conditions in Vietnam. Each letter presents an account of life during the war and expressions of thanks and love – a moving tribute that draws visitors to the water's edge to make key connections between the memorial's purpose and the tranquil sur-





## Place of Flags

rounding environment.

From here, visitors may either follow an unpaved woodland path and boardwalk that crosses over a wetland area or follow a more formalized and manicured path that meanders along the western edge of the pond to Place of Names. Here, a group of six granite monoliths commemorate 1,537 individuals from the Commonwealth of Massachusetts who lost their lives during the war. The subtle sound of a gently splashing fountain and spillway add to the serenity of the space, allowing reflection on the meaning and enormity of the losses represented by the memorial itself. From this meditative space, visitors can see Place of Flags and Place of Words across the pond.

Leaving Place of Names, visitors pass through wildflower meadows – reflecting a spirit of life and regeneration – before returning eventually to Place of Flags

Initially envisioned by a group of veterans' organizations during the early 1980s and discussed as something that would be appropriate at one of several potential sites in Boston itself, the memorial was long delayed due to inadequate funding and the lack of a clearly articulated vision or design.

By the mid-1980s, the Vietnam Veterans Memorial Trust had been formed, and its members approached legislators about setting up a memorial in central Massachusetts to make it more readily accessible to visitors from around the state. With legislative encouragement, the trust approached the City of Worcester with a request for assistance in finding a site. Reviewing ten suggestions, the trust settled on Duck Pond in Green Hill Park as their primary recommendation.

In 1988, the city offered the site and agreed to co-sponsor a design competi-

managed all phases of construction. The widely heralded outcome of the project was a direct result of the highly constructive and cooperative atmosphere that allowed so many individuals and groups to work together to achieve a most significant goal.

### Key Alignments

For its part, the state provided the primary funding, while the City of Worcester ceded a dramatic space at the heart of its 500-acre flagship, Green Hill Park. But funding and a home were, as we soon discovered, just two among the large number of factors that had to be aligned to move the project along.

The issue of public access and convenience was one such consideration. Duck Pond is easily accessible and located within a well-known park with its own history of use by local citizens and

Water has so much significance because, as any veteran will attest, it was such a notable part of the Vietnam experience because of the prominence of bodies of water, rivers and wetlands in the Southeast Asian landscape.

and the memorial's gateway.

The paths, Places and grounds of the Memorial feature granite and brick pavements, stone walls, irrigation systems, lighting, signage, extensive gardens and plantings as well as the meditative seating areas linked by the meandering pathways, but the engraved granite monoliths along the water's edge are definitely the focal points of the memorial, with the water itself serving as a significant foil.

Water has so much significance because, as any veteran will attest, it was such a prominent part of the Vietnam experience – not just associations from being transported over oceans to get “in-country,” but also because of the prominence of bodies of water, rivers and wetlands in the Southeast Asian landscape. The reflection of the monoliths on the surface of Duck Pond recalls, enhances and elevates the experience.

### A Long History

As was suggested at the outset, however, this serene conclusion was long in the making.

tion with a modest level of private and public funding. Ten designs were selected as finalists, and a concept from the artist team of Harby/Rogers/Catanzaro was chosen. A model was presented to the Governor's Council for approval and for formal acceptance by the legislature as the official design and site for the statewide memorial.

On parallel tracks, preliminary construction documents were drawn up and local, state and federal permitting efforts for the establishment of the memorial were undertaken. With changing economic conditions, however, the project was delayed once again – and stayed on the shelf for more than ten years when, in 1999, the legislature finally appropriated funds to build the memorial.

The success of the memorial ultimately depended on a collaboration of state, municipal and private entities as we honed in on obtaining final environmental permits, developed the final design and construction documents and

others, but the Massachusetts Highway Department is charged with improving access to state memorials and historically significant sites and saw that park access needed some upgrading.

Before they were finished, the department provided full-depth roadway reconstruction and major utility installations to enhance access to what they considered to be a “remotely situated” memorial. They also set up directional signage and site information along the many state highways that pass through and around Worcester and its suburbs.

The Massachusetts Executive Office of Environmental Affairs, the Worcester Conservation Commission and the U.S. Army Corps of Engineers also became involved because part of the construction program called for draining Duck Pond and dredging away sediments that had been found to contain elevated levels of total petroleum hydrocarbons.

The disturbance of the wetlands area was to be temporary, but the permits





# Place of Words





specifically required the eventual restoration of wetlands all around the pond's perimeter. Our plans approved, the city's Parks Department drew down the pond, after which the Massachusetts National Guard completed the dredging and removal of pond sediments.

Worcester's Parks Commissioner Michael V. O'Brien, along with Massachusetts Veterans Affairs Commissioner and Medal of Honor recipient Thomas G. Kelley, made dramatic presentations to catalyze public support for the project and raise hundreds of thousands of dollars in additional funding and labor and material donations from private entities.

Indeed, corporate sponsorships were crucial to completing the project without resorting to scarce additional public funding. In this effort, the Veterans Agent for the City of Worcester, Pierce Gould, worked tirelessly to involve veterans and

veterans' groups throughout Massachusetts in the project as it headed toward dedication ceremonies.

### A Time for Remembrance

The memorial was dedicated in week-end-long ceremonies in June 2002, where we joined 5,000 individuals, representatives of veterans' groups and a host of federal, state and municipal officials to pay tribute and respect to Massachusetts' veterans of the Vietnam War.

The ceremonies began with an ecumenical service followed by formal recitation of the 1,537 names of military personnel from Massachusetts who lost their lives during the war.

Massachusetts Senator John F. Kerry, a navy veteran of the Vietnam War, was keynote speaker and captured both the emotion of past losses and the importance of having a living, permanent

memorial to be shared by all those from Massachusetts whose lives were changed by the Vietnam conflict. Senator Kerry also expressed his admiration for the Massachusetts Memorial, comparing its emotional impact with that of the national memorial in Washington.

Now, so many years later, the courageous actions of 1,537 servicemen and servicewomen have been respectfully acknowledged for all time, along with the families of those who lost their lives as well as the veterans who came home to a country ambivalent toward the plight of veterans and their families.

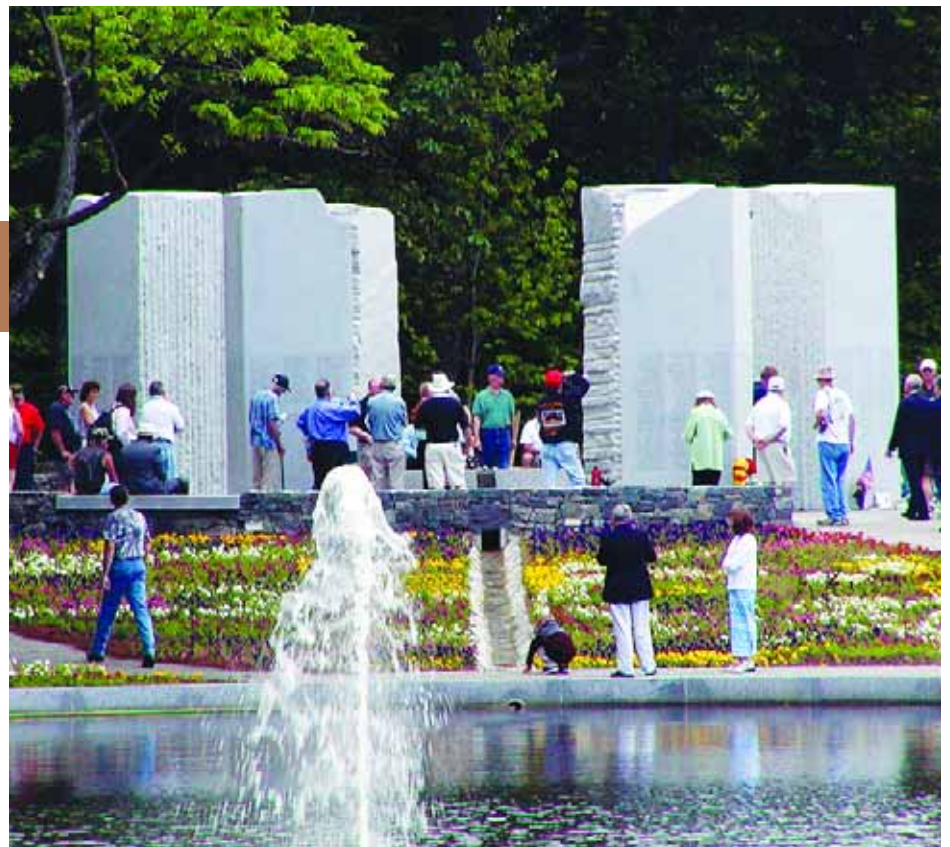
It is our hope, and the hope of everyone who participated in the development of the memorial through the past 20 years, that some measure of peace, comfort and unity can be found within this beautiful setting in the heart of Green Hill Park.







# Place of Names



Not long ago, hydraulics consultant Jeff Freeman traveled to a remote area of Panama to renovate the circulation

and filtration system on a big pool at a mis-

sionary camp that serves

its region's under-

privileged

children.

The

situation he

encountered is a

textbook case in just how

bad things can get when hydraulics are not

well considered before construction – and how much

they can be improved through application of some

common sense.

By Jeff Freeman

# Remote







# Patrol

It's truly a diamond in the rough: a huge, sparkling blue pool set in the middle of nowhere in a country that is probably best known for being the gateway between two grand oceans. For a time before I arrived on the scene, however, the enormous rectangular swimming pool at Palabra de Vida, a Christian missionary camp in Chame, Panama, was *anything* but shimmering.

The mission operates a camp for the region's underprivileged children, who visit the facility in shifts that stretch across several months each year. There are times when the camp is quiet and almost empty, and others when it is a beehive of activity. Last year, the facility's staff ordered a water-treatment system for the pool, and, in my role as technical sales manager for Eco-Matic Systems of Newport Beach, Calif., I was asked to travel to the site to install a new chlorine generator.

Upon arrival, I discovered a plumbing, pumping and filtration system that was totally inadequate to the purpose. Water quality was dreadful, power consumption was astronomical and maintenance was a nightmare. Passionate about proper hydraulics and hating to see any pool function so poorly, I volunteered to donate my services and oversee a complete renovation of the system. The good people at the mission took me up on my offer, and here's what came to pass.

## Setting the Scene

The terrain surrounding the 62-acre facility is stunning, a broad veldt bordered by towering coastal mountains on the Pacific side of the isthmus. The area immediately surrounding the camp resembles the African savanna – cattle ranches and pasturelands interspersed by swaths of teak forest as the land rises to the mountains in the distance.

The pool itself is as big as those great outdoors: It measures 65 by 82 feet, ranges from 3-1/2 to 7 feet deep, and holds about 220,000 gallons. The construction is unusual, featuring a poured-concrete floor and block walls filled solid with concrete and scratch-coated with plaster. In fact, the only good thing about the three-year-old pool (besides its setting) was the shell, which had been designed by a structural engineer in Panama City.

Widely believed to be the largest swimming pool in the whole country, the vessel only cost \$50,000 to build, which, I suppose, only confirms the adage, "You get what you pay for." The pumps were too big, the filters were too small and the plumbing was far too small. And it had just six skimmers, all poorly placed.

To put the inadequacies in perspective, commercial pools in the United States are generally required to have a skimmer for every 500 square feet of surface area. In this case, this means that the pool should have had 11 skimmers, not six. Not to overstate the case, but it's safe to say that whoever installed this system made just about every major mistake that could be made with respect to hydraulics.

As a result, the pool was cursed with awful water quality, radically inefficient energy use and a maintenance situation that defied belief. On warm busy days, for instance, with 200 to 300 kids in the pool at a time all day long, the camp staff would clean the three 72-square-foot, non-backwashing D.E. filters *three times each day!*

To complete the picture of this little pool of horrors, the plumbing system had 18 return lines, all wall-mounted, and three main drains, each of which had its own line back to the equipment pad. Basically, it had been



Before I returned for my second visit, the trench just beyond the deck had been dug – but that still left us with the task of burrowing beneath the deck to reach the shell and address the needs of the plumbing – and of cutting away sections of the deck to set up the new skimmers.



configured as three separate systems (there are no split-suction safety concerns in this country), with a three-horsepower pump feeding each filter and with two skimmers and six returns per pump.

### Systematic Ills

Even though this is an extreme situation in an exotic setting, the systems issues presented by this Panamanian pool offer a remarkably simple case study in hydraulic design for swimming pools.

What we had here was a pump that wanted to move an absolute, bare minimum of 150 gallons per minute and that was trying to do so through a single 2-inch line from the main drain and two 1-1/2-inch lines from the skimmers. Some of the runs spanned more than 100 feet, so just imagine what the resistance (or feet

of head) in those lines must have been!

Consider as well that each pump was driving a filter that, at the far end of its maximum operating range, can only handle 144 gpm. Those pumps were *screaming* with cavitation, and there was so much pressure inside the filters that the grids were being crushed.

In turn, the excessive pressure reduced the filtration area and thus each filter's cleaning capacity, aggravating the situation dramatically. In fact, the staff was replacing entire grid sets every three months, and conditions in the pool kept getting worse. When everything was working (which wasn't often the case), the optimum turnover rate was something like once in 18 hours. When I installed the chlorine generator, my rough calculations showed a 23-hour turnover – not good!

Furthermore, the original builder failed to consider wind direction in laying out the skimmers. As luck would have it, there was no skimmer at all in the one corner of the pool to which the prevailing winds normally pushed debris. The result: A pocket of debris the size of a large residential pool would form in that corner almost every day.

In addition, the pool was installed in clay soil without suitable techniques. Indeed, the plumbing lines had all been buried in haphazard clusters in ditches that had been backfilled with chunks of clay – no sand, no attempts at compaction. And this is a place where it's generally bone-dry about six months each year, with rainfall of 160 inches or more through the other six months.

So after they built the pool (presumably



during the dry season), the rains came and all of that loose-clay backfilling material was compacted by Mother Nature – and had the effect of crushing, shearing and otherwise destroying much of the underlying plumbing. So pipes were bowed, pulled out of fittings or snapped. After just a few years, the system was already losing about 1,000 gallons per day.

The situation became so bad that they gave up and drained the pool about two months before I made my second visit to the camp.

### Coming Together

But let me back up a bit: During my first site visit, I made a series of quick measurements and calculations, sat down with the staff and told them what could be done. They immediately asked me to come back and oversee the renovation, promising to assemble a work force and make all the requisite equipment and material purchases in advance of my return.

When I came home to California, the first thing I did was employ the “keep it simple” concept – something I apply whenever it’s possible in my hydraulic designs.

In this case, I wanted to simplify the system to ease maintenance and increase reliability. So I did the calculations that should have been done in the first place, starting with determinations of the pool’s capacity, a projected bather load and a target turnover rate. I thought about skimmers (number and placement) and the plumbing configuration and, ultimately, developed a game plan for the construction project.

At the heart of all of this, I wanted to simplify the hydraulics by using big pipes, big filters and *dramatically* downsized pumps. I acquired the equipment on behalf of the mission from Ontario, Calif.-based Pool Electric Products, which handled the shipping for me. The pumps and filters were from Sta-Rite Industries (Delavan, Wis.) and consisted of Max-e-Glas II pumps and System 3 modular-media cartridge filters.

I chose cartridge filters for two reasons: First, diatomaceous earth is hard to come by in Panama; second, cartridges offer greater filter area in smaller relative spaces. In changing the filters, in fact, we went from 216 total square feet of filter area in the three D.E. filters to 1,800 square feet

with the six modular units. The new plumbing is Schedule 40 PVC, with 4-inch, looped suction and return manifolds surrounding the pool, stepped down to 2-inch branches to the returns and in lines coming from the skimmers and drains.

(As a side note, the staff wondered why I was replacing three pumps and filters with six until I explained that the renovated pool would use half the power while tripling the turnover rate.)

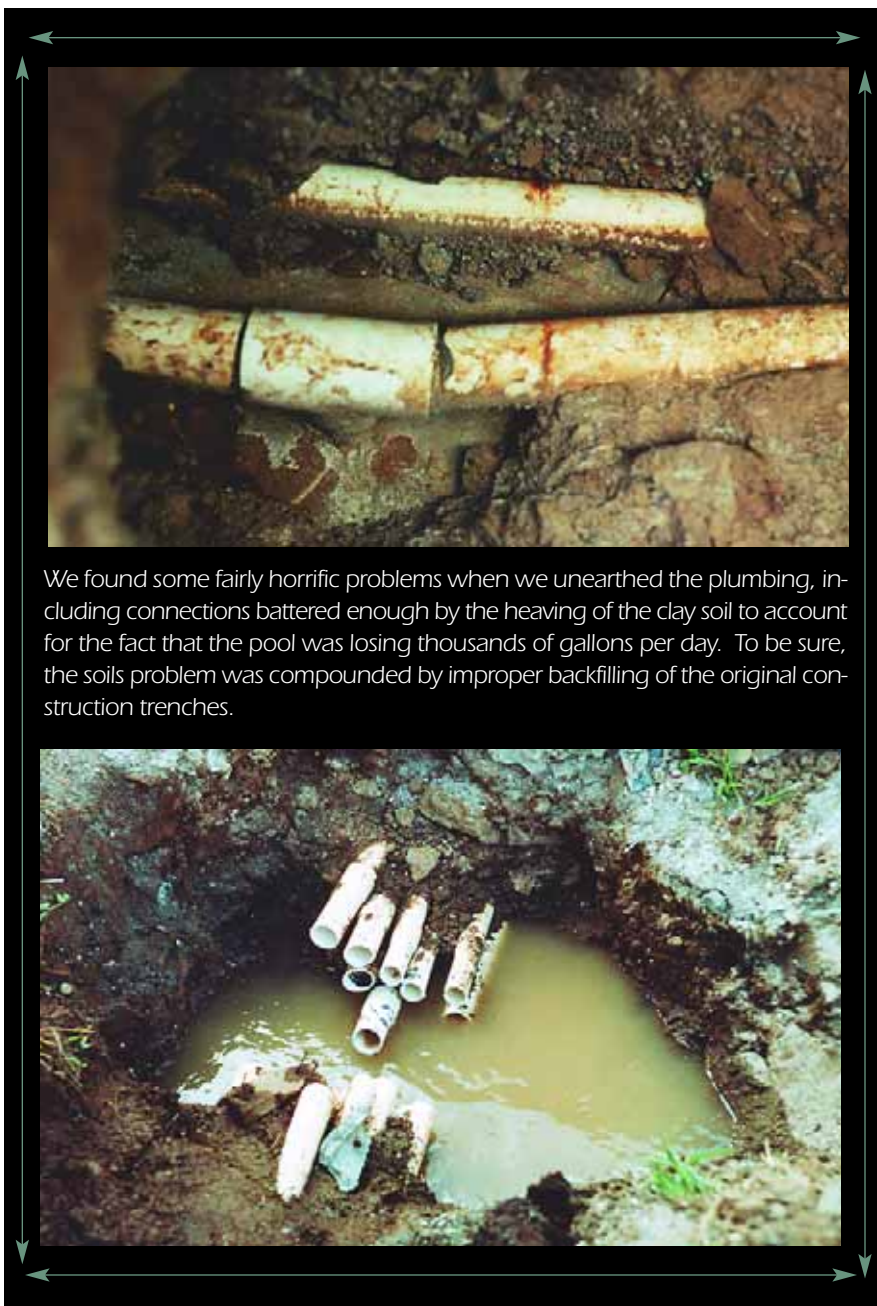
I knew I could acquire the pipe in Panama, but the fittings – as I had learned on my first trip – would be another sto-

ry. Not wanting to be caught short, I had shipped an ample supply of fittings through a distributor in Florida.

Plans in hand, I was less concerned about the hydraulics than I was about the logistics of working in such a remote location. I had no idea what the workforce would be like with respect to skill level, and there were huge questions about what we’d run into once we started digging.

### Down to Business

To set things up before my arrival, I’d asked the camp’s staff to backhoe a full-



We found some fairly horrific problems when we unearthed the plumbing, including connections battered enough by the heaving of the clay soil to account for the fact that the pool was losing thousands of gallons per day. To be sure, the soils problem was compounded by improper backfilling of the original construction trenches.



We made good use of a core drill we found among the mission's store of tools and set new suction and return lines all the way around the pool. All those lines, properly sized and looped, ultimately ran back to a thoroughly remodeled equipment pad.

perimeter trench just beyond the five-foot band of decking that surrounded the vessel – and also to trench back to the equipment area.

By the time I landed in Panama, all of the equipment had been delivered along with 400 feet of 2-inch pipe, 920 feet of 4-inch pipe and a multitude of fittings. In all, I personally set 475 glue joints; why I kept track of that number, I'm not quite sure – other than to remind myself that the project involved lots of hands-on labor in the trenches for all of us.

The crew included six Americans from Racine, Wis. – part of a missionary group on hand to work on the dormitory buildings – and six Panamanians. Everyone was extremely helpful, and I've never seen a more positive work ethic anywhere: It had all the spirit and atmosphere of a community barn-raising.

That was a good thing, because the pool renovation involved a lot of hard work all around. We had to burrow under the deck at almost every return and skimmer location, leaving out two returns and one skimmer we couldn't reach because the deck widened in one area to accommodate an outside shower and restrooms and tunneling wasn't advisable. (In those spots, I isolated the old plumbing and pressure-tested it. We were lucky in that soil settlement and heaving had not significantly affected the pipes in these locations.)

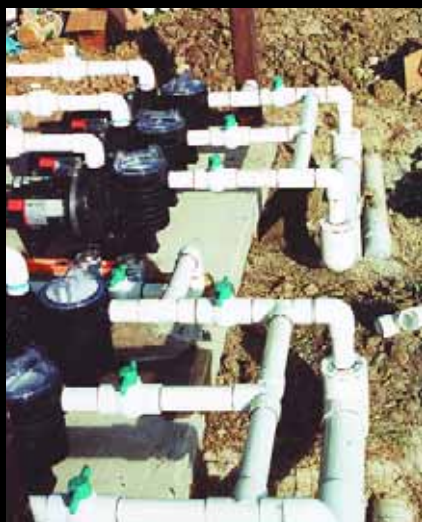
In all, we dug 15 burrows to the return lines, five to skimmers and three more where we cut into the deck for placement of new skimmers. We also pressure-tested the 2-inch main drain plumbing. I would have preferred up-sizing these drain lines, but they proved to be sound and would have to do: Replacing them would have been a huge undertaking even in better working conditions.

In three places, return lines had been so thoroughly pinched and broken that clean removal and replacement wasn't an option. We were fortunate to find a core drill we could use to punch through the shell to set up new lines.

We set the 4-inch plumbing into the trenches and stepped it down to all of the 2-inch return lines, forming a classic return loop – and did exactly the same with the suction loop and the requisite branches to the skimmers and drains.

To compact the new trench, we repeatedly filled the space with water, allowing it to settle. When the clay finally stopped settling, we had about four inches of freeboard beneath the plumbing lines and backfilled the space with sand. (The local sand consists mostly of crushed seashells, excellent for drainage around our plumbing runs.) Atop the sand, we finished the backfilling with about a foot of topsoil.





There's a certain delight in properly setting up an equipment pad that reflects proper hydraulic thinking – one that will, in the case of a renovation such as this one, take an inefficient, inadequate and wasteful mess and turn it into a system that literally purrs by comparison.

## Grand Conclusions

With all the heavy work done, it was largely a matter of mopping up and fine-tuning things back at the equipment pad. One key upgrade involved setting up valves in irrigation boxes that let the staff shut off the skimmers to create more suction for vacuuming. The new skimmers are all SP 1070 dual-port units made by Hayward (Elizabeth, N.J.).

In everything we did, we were fortunate that the camp had a well-equipped tool room. It seems that, through the years, dozens of missionaries have come to the site, donated their labor to building camp facilities and left their tools behind. So we were able to find, for example, all the diamond blades we needed to notch the pool walls for the new skimmers. We also discovered a general store about 30 minutes away that sold everything from tractor tires to fingernail polish.

In all, the project took just five days from start to finish. A couple of those ran full 24-hour cycles with us on site, but the crew stuck with me every step of the way. We started filling the pool two days before I left, and I was on my way home before the staff added the 7,000 pounds of salt needed by the chlorine-generating system. It was one of the most exhausting (yet invigorating)

working weeks of my entire life.

I haven't been back yet to see how things are going, but I've been told over and over again that the water is crystal clear, the pumps are purring and the power consumption is, indeed, just a fraction of what it once had been. Knowing that

the missionaries of Palabra de Vida (and, more important, their "clients") are enjoying a pool that is finally functioning as it should is certainly satisfaction enough for me – but I must say that I'm looking forward to my *next* trip to Panama, when it's time for a big replastering job.

## In Praise of Multiple Pumps

On large commercial projects, I always opt for clusters of small pumps rather than for smaller numbers of large pumps. Here's why:

- ✎ Small pumps are inexpensive.
- ✎ If one pump fails, you lose less of your pumping capacity while a replacement is obtained.
- ✎ Replacement parts for small units are far less expensive and are more readily available than are those for large pumps.

Also, by using multiple pumps, you're running water through more hair-and-lint traps, which are typically six inches in diameter regardless of pump size (up to a point, anyway). By using multiple pumps, you essentially increase the space that the water flows through in entering the pumps, which is the same as running larger volumes of water through larger pipe and, in turn, increasing water flow through the system.

Multiple pumps also increase energy efficiency because you can get greater volumes of water through multiple traps. One 3-hp pump, for example, can produce a flow of 150 gpm if plumbed properly. One 3/4-hp pump can produce a flow of up to 75 gpm. In other words, the two smaller pumps produce a 150-gpm flow rate while consuming just 1-1/2 hp of energy.

Finally, when plumbing multiple-pump systems such as the one described in the accompanying text, I always opt for looped manifolds from which I branch off to the individual pump connections. In this case, there are two manifolds, and the fact that both are looped makes for more balanced flow and even pressures throughout the system.

—J.E.



# Beyond

A photograph of two men in a garden. One man, wearing a light green jacket and a dark cap, is seated in a wheelchair and is reaching out to touch a green, needle-like plant. Another man, wearing a light blue hoodie and blue jeans, stands behind the wheelchair, looking down at the man in the wheelchair. In the background, there is a white house with a small window and some trees. The scene is outdoors, with rocks and plants in the foreground.

# Vision



Creating a garden space for the sight-impaired and physically handicapped presented landscape architect Bruce Zaretsky with a meaningful challenge — one that, he says, prompted him to rethink some of the fundamentals of garden layout and aesthetics. The first fruit of his new thinking is this space, in which the serenity and delight of relaxing in a garden space is opened to a wider range of visitors than most designers ever have cause to consider.

By Bruce Zaretsky

**T**

he process of designing a watershape or garden usually requires the designer to answer a number of questions — the vast majority of them having to do with *seeing* the water and the landscape. Indeed, from considerations of color and scale to managing views and ensuring visual interest within the space, much of the designer's skill is ultimately experienced by clients and visitors with their eyes.

But what if your client is blind or wheelchair-bound or both? How do you design for them? What colors do you use in your planting design? Would you even care about color? How will they move through the space and what experiences will await them? What would be the most important sensory evocation — sound, fragrance or texture?

These are the sorts of special questions we asked ourselves after being approached by clients who had the desire to create a sensory garden for visually impaired and physically handicapped people. The experience shed a whole new light on the power of non-visual aesthetics and prompted me to consider the art of watershape and landscape design from an entirely fresh perspective.

### Loving Touches

The clients saw the project as a fitting memorial to their recently deceased daughter, Sharon, who had lived her life blind and in a wheelchair.

In our conversations with her parents, we learned that despite these handicaps, Sharon had loved being outside and spent a great deal of time experiencing the myriad textures and fragrances of the plants in the family's garden. She loved the feel of water running over her hands and of the rain falling on her face, and she'd spend tremendous blocks of time experiencing the fuzziness of lamb's ear or smelling the fragrance of lavender as she rubbed her hands through it.

In her honor and, more important, for the benefit of others who live with similar challenges, we were charged with designing a garden that worked across all of the senses. The space that would become "Sharon's Garden" was to be placed in a 60-foot-square area behind the Nature Center at Mendon Ponds Park near Rochester, N.Y.

By design, it's a pleasant enough place to enjoy visually, but it is actually





**Rough Conditions:** Our work on-site took place in a raw stretch of weather, and we struggled steadily with rain, snow and mud (A) as well as the need to remove an old, dysfunctional pond (B) on our way to making Sharon's Garden a reality.

## Smell and Touch

Fragrant and textured plants are the star attractions of Sharon's Garden, but using so many fragrant plants in such a small area made for some challenges in placement. We tried to separate the heavier-scented plants with buffer zones of textured plants, for example, all while keeping everything close enough to the pathways to be touched.

Here is a sampling of some of the plantings used in this garden:

**For fragrance:** Juddii viburnum, Carlesii viburnum, blue mist shrub, Miss Kim lilac, catmint, bee balm, meadowsweet, butterfly bush, honeysuckle, lavender, sweet woodruff, astilbe, Virginia sweetspire, summersweet, fragrant hosta, creeping thyme, oregano, lemon thyme and lemon balm.

**For texture:** Hinoki cypress, doublefile viburnum, leatherleaf viburnum, fountain grass, maiden grass, Elijah blue fescue, lamb's ear, sedum, hillcreeper pine and fern Mullien.

**For both:** rosemary arp, santolina, woolly thyme and sage.

—B.Z.

one that is more truly appreciated with eyes closed and mind opened to the information received via ears, nose and skin.

At first, the notion of setting up such a space was intimidating, but once I was able to open my mind to the possibilities found in the non-visual senses, the ideas flowed like a waterfall. This was fortunate, because there weren't all that many precedents for us to study: In fact, we found fewer than a dozen so-called "sensory gardens" in all of the United States. So instead of turning to others for inspiration and guidance, we started from scratch and had to imagine what it would be like to move through a garden without being able to see it.

Immediately and obviously, we knew that the space would need lots of texture and extremely fragrant plants. We also knew right away that the space would require raised garden areas in which plants and rocks would be readily within reach of those in wheelchairs. And we knew as well that the sound and feel of cascading water would be a big part of the overall program.

In similarly basic ways, we knew the garden would need pathways wide enough for people in wheelchairs and those on foot to navigate, comfortably and together, in an unhurried, relaxed and restful way.

## On-Site Practicalities

These basic observations led us directly to the first of several significant design decisions: the garden's planting areas were to be raised in beds lifted by five different types of stone – dolomitic limestone, granite, Medina sandstone, Laurel Mountain stone and cobbles. Not only did these species offer a variety of textures, but they kept us in touch with the fact that sighted people would also use this garden.

In these raised spaces, we ended up using a range of plants selected for texture or scent or both (for details, see the sidebar on this page). We staged and arranged each to provide subtly shifting experiences for those lingering on the pathways.

Once on site with a solid game plan, the first thing we did was to remove an existing garden and pond that were decidedly *not* accessible to the handicapped or visually impaired. A wet spring made for muddy work as we



removed old timbers, plantings and a concrete pond. The pond's shell wouldn't hold water and wasn't salvageable, but it was still strong enough that we needed a jackhammer to break it up.

When the site had been cleared, we graded the area with a new set of contours and began the work of laying out the walls and watershapes.

The waterfall is the garden's centerpiece. It drops about 18 inches from a concealed point of origin, and then cascades down another 24 inches over a flat slab stone and on into a stream. We didn't have a great deal of space to play with, so the stone structures aren't particularly elaborate. Instead, we focused on sound and touch and on crafting a waterfeature scaled to its surroundings.

The stream runs across a walkway and into a pond positioned near the building. The pond is 12 inches deep – sufficient to support water plants, but not deep enough to pose dangers to any children who might end up playing in what is, after all, a public garden. As an added safety measure, the pond itself is set about three feet back from the edge of the pathway to avoid accidental immersions of those in wheelchairs.

The path was built up using a base of crusher run over fabric, topped with stone dust. We knew that with proper compaction and a bit of water, the stone dust would harden to about the consistency of concrete – but would be much less expensive. This hard surface allows wheelchairs to use the pathways without any danger of sinking into the ground. In addition, the paths have a stone edging to keep wheelchairs from rolling into the gardens.

For stability, all of the slab, boulder and cobble walls are set on bases of crusher run and were backfilled first with crushed stone (for proper drainage) and then with a mix of screened topsoil and compost. The walls were also backed up with landscape fabric that will allow water (but not soil) to filter through.

### Test Driving

Once the walls had been built and the watershapes were up and running, we borrowed a wheelchair and asked a representative from the Monroe County (N.Y.) office responsible for local administration of

## The Thick of Things

At the point where the waterfall drops a final 24 inches into the creek, we originally set up a wooden bridge to cross the water. That bridge, however, proved to be temporary and actually became a form for the concrete bridge with which it was replaced.

This more permanent and stable structure had a couple of advantages: First, we were able to imprint it with various animal tracks as it traverses the four-foot-wide stream, enhancing both the visual and tactile experiences; second, we set it up right up against the waterfall, enabling people in wheelchairs to put their hands directly in the falling water.

– B.Z.



**Inclusive Features:** In setting up the space, we wanted to meet the needs of all potential guests. Signage in English and Braille was a key to encouraging full and complete enjoyment of the textures and fragrances of the garden.



the Americans with Disabilities Act to traverse the garden with us.

We rolled up to the edges of the slab walls and reached out to “touch” the not-yet-installed plantings. We crossed the bridge over the creek bed and put our hands in the waterfall. We backed into a special wheelchair “parking space” we’d set up in the Medina sandstone wall – a place where a visitor is surrounded by plantings on three sides.

When we reached, turned and bumped into the stone and generally satisfied ourselves (and the ADA representative) that what we had here was not only going to be a beautiful garden for those who see, but also for those who could not see or walk, we knew we had passed a crucial test with flying colors.

So we continued with construction and prepared the beds for planting. As proud as we are of the physical structures and waterfeatures, the real stars of Sharon’s Garden are the plants: more than 170 linear feet of raised beds incorporating more than 75 varieties of plants including summersweet, fragrant viburnum, Virginia sweetspire, Miss Kim lilac, butterfly bush, astilbe, fragrant hosta, geranium, Lamb’s Ear and much more. The herb garden alone features nearly two dozen species: three kinds of thyme, lemon balm, tarragon, lavender, rosemary, oregano and three kinds of sage, to name just a few.

It is indeed quite a symphony. Ornamental grasses and bamboo practically beg to be caressed, and unlike most public-garden spaces, visitors are actually *encouraged* to rub the plants, smell them and experience their textures and scents. Important to the garden is the inclusion of 20 brass nameplates that identify a selection of plants in both English and Braille. A custom-made mailbox holds literature describing these plants, again in Braille as well as English.

### On Its Way

Once the garden was complete, a ribbon-cutting ceremony attended by the leadership of Monroe County and other local dignitaries was organized.

Local television crews and newspaper reporters were on hand and recorded possibly the best public-relations coup the new facility could have scored: the arrival of a blind couple who had heard about the garden and had showed up with perfect timing just before the news conference began.

As the couple felt their way around the garden, touching the plants and then feeling the Braille identification signs, I don’t think they noticed that about fifty sets of eyes were following them as well.

We were all transfixed as they touched and smelled the plants, easily navigated the pathways and eventually came upon the stream. As they made their way around the garden, enjoying the beauty of nature in a welcoming setting, we knew in an instant that the six weeks of working through rain, snow, mud, aggravation and worry about finishing on time had all been worth it and that Sharon’s Garden *would* be all we had imagined it *could* be.



**Easing Access:** Sharon’s Garden has a simple layout, with wide paths encircling the raised planting beds of the central island and its touchable waterfall (A). The cascade (B) flows beneath a simple bridge before reaching a small pond next to the nature center (C). In every way possible, our focus was on placing garden features at levels easily reachable from wheelchairs and within easy range of both blind and sighted visitors.



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# Poetry

in

Stone

With his rugged works of shaped water and stone, Colorado-based sculptor Richard Hansen has spent a career exploring what he calls 'poetic dialogues' between nature and humanity, permanence and ephemera, distance and intimacy. But his interest in the materials he uses goes well beyond such philosophical notions: He's a hands-on artisan who particularly enjoys, he says, the unique sound that stone makes when it splits.

By Richard Hansen

The avant-garde composer John Cage once said, "Art exists to make us aware of the very life we're living." I've always loved that statement because, as someone working to create works of art, the experiences of my own life have naturally been transferred into the way I've chosen to express myself – and, I hope, have enabled me to succeed in bringing other people to an awareness of experiences in their own lives.

For me, water is the key in these transferences: Even though I'm probably more often described as a sculptor of natural stone rather than as a watershaper, the dialogues I have with the materials I use and with those who observe the outcomes have always begun with the way I work with water.

I grew up in the Midwest on the banks of the Mississippi. As a child, I lingered on the untamed shores of the creeks, streams and rivers that laced across an otherwise developed and thoroughly mechanized landscape.

I would read or draw, stroll idly along a stream, or spend hours building a raft or dam. This was well before I'd begun to think about my relationship with water in any sort of artistic way, but there's no question that those experiences remain at the heart of my passion for work-



ing within this endlessly complex and intriguing medium.

### Dialogues With Nature

When I went off to college at William & Mary in Williamsburg, Va., I initially studied poetry. But the first time I wandered into a ceramics studio, my love affair with sculpture began. Working at first in clay, I quickly discovered that I was the most interested when the material assumed a rough, stony texture.

One day, I thought, “Yes, of course: *stone*.” Soon thereafter, I recognized that my artistic impulses were best expressed in sublime combinations of water and stone – and I’ve been exploring their collaborative poetry ever since.

These days, I live and work in an adobe studio tucked in the Colorado Rockies just a few miles from the banks of the upper Arkansas River. In these spectacular surroundings, I’m engaged daily by the complex, native “conversations” between stone and water and see local settings as a constant source of profound inspiration.

In cultivating this inspiration, I’ve come to appreciate Colorado’s big picture – the broad landscapes, massive landforms and breathtaking views. But I’m even more drawn to the smallest of patterns and details, such as the fine grain in stone or the odd place on a stone edge where a small runnel of water has flowed to create a subtle and unique tracery.

As I approach the Arkansas River, I seek out intimate details that exist within the larger context. Often, these observations have to do with the interaction of water and stone, but they’re also about water and soil or even water and ice and snow. I was recently hiking on the banks, for instance, when I noticed the way that the sweep of the main current in one stretch had carved an incredibly graceful arc in a bank of ice along the shore.

Even though I do relatively large-scale

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## The Farley/Reilly Fountain

From a distance, this fountain on the Riverwalk in Pueblo, Colo., reads like urban design, but as you get closer, you see far more detail and an approachable, intimate interaction of stone and water.

The water steps at the base of the composition offer a key visual link to the river in the foreground at the same time the flow helps to oxygenate the river – an important function in an urban stream. To that purpose, this portion of the fountain, fed by river water in the tradition of grand Italian fountains, flows year 'round.

Above, the ripple panel and the upright stone elements put on a real visual show, with sunlight shining through the cascade during much of the day. This portion of the composition, intended to encourage viewers to approach and touch the water, re-circulates with water suitable for human contact:

This dual-nature hydraulic system was designed by Rick Aust of Aqua Engineering and water engineer Chuck Knight, both of Pueblo. The ripple panel on top is there to suggest the flow of water for the five months yearly during which the re-circulating elements of the fountain are not operating. This suggestive technique is derived from Islamic precedents, but it uses distinctive flavors of the American west.

The stone for the granite uprights was found at an abandoned Bureau of Land Management quarry. I looked for pieces with character, then split them and re-assembled them over four standpipes that feed water to the system. The slots, cut into the stone using Medieval carving techniques to yield a rough-hewn texture, are intended to reflect the architecture of the nearby Pueblo City Hall.



sculptural pieces, I'm always looking for ways to add details that draw viewers closer and closer to my work. As I conceptualize a piece at the commission stage, for example, I might envision someone walking toward it and encountering a vigorous cascade of water, throbbing with energy as it dances downward. But as that person approaches, I want his or her attention to be rewarded with smaller, deft revelations of texture, sound and the interplay of light and shadow.

These intimacies are so important that I would characterize my design process as one of starting with an up-close vantage point, considering the intimate experiences first, then stepping away to encompass the larger context and the broader landscape. I design this way because I always hope that someone who starts by reading and interpreting my work from afar will be inspired to come closer.

### Terms of Discussion

As artisan and sculptor, I owe much to traditional stonemasons who've given modern sculptors a wonderful set of tools and skills we can use in interpreting stone. I've made a point of studying those traditional and, in some cases, *ancient* mason's techniques, and I enjoy the way that using such tools and methods links my efforts with centuries-old traditions and practices.

At the same time, I have tremendous respect for the hydro-technology and techniques used by modern watershapers. The way that water can be sprayed and propelled into the air is all fascinating and exciting stuff.

Within my own work, however, I tend to use these hydraulic technologies and techniques to create understated, naturalistic flows that evoke subtle feelings and memories among their viewers. Sometimes, of course, I'll run 300 gallons per minute down a narrow slot with all sorts of exuberance, but in others and more often, I'll fill a basin so slowly that the water barely climbs over the edge.

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Also in Pueblo, this piece is located at the Sangre de Cristo Arts Center, which stands about a mile from the Farley/Reilly Fountain. Where the latter project emphasized the vertical, this one focuses on horizontality – a contrast I saw as important for two large-scale works by the same artist within such close proximity.

It's also true that the horizontal elements of the Founders' Fountain fit well within the architectural context of the center – and particularly with the dramatic steps and plateaus that mark the spaces set up as part of the original construction. Indeed, the stone slabs of the plinth are split with the same proportions as the steps, and the pyramidal form of the plinth also reflects the stairways geometry.

The primary flow of water emerges from the crevice between the two horizontal stone elements. At the base is a pool with a spiral element that guides the falling water to a drain. The water here is actually quite shallow – perhaps a quarter-inch deep – and is set up to invite both children and adults to touch it or step in. The surface water flows into a chamber below, creating a final acoustic effect.

The water appears to (but doesn't actually) re-emerge eight feet away in a stone basin that's made from the same gray granite as the other stone elements and then spills into a naturalistic pool. The overall intention here is to suggest a sense of transition from rigorously architectural sources onto more naturalistic scenes, where the stream and pond feature native sandstone and water lilies.



## The Founders' Fountain

Either way, what I want to do is let the water express itself in some specific way.

To that extent, my work is inspired by Japanese garden design, wherein water is brought into close view and allowed to create its own dialogue with the viewer through its interactions with simple natural elements of stone, wood and earth. The masters of Japanese design understand that through their artful interventions, they can, in a sense, liberate the water to express its native character and thus encourage observers to interpret the forms that water surrounds, covers, fills and caresses.

In sharp contrast, however, I'm also inspired by water in utilitarian forms. In the American Midwest, for example, you might come upon a well that fills an old concrete basin, or a windmill that draws water into a stock tank, or a retention pond used for irrigation. In such settings, the water offers stark and refreshing beauty in the midst of an otherwise arid landscape.

So whether it's through nature, art or in the service of humankind, water provides constant variety and richness – but without having shape, color or form on its own. Therein rests one of the natural world's most delicious ironies – and a big part of why I see and appreciate stone as the perfect foil to water's ephemeral nature and physical qualities.

### Quiet Interventions

At heart, I see a piece of stone as the “form memory” of a specific geological process. It offers detailed evidence of the immense pressure, heat, thrust, erosion and/or sedimentation that were required to shape it. And the fact that we're aware of this and able to see these processes in the stone itself enables me to use that information for art's sake – to my way of thinking, a profound privilege.

In limestone, for example, we see and can touch layers of sediment laid down in prehistoric seas. In granite, which is my primary working material, we see igneous rock forged by inconceivable heat and pressure and ultimately brought to light by heaving up-thrusts that some-

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## Topos

This project, located at St. Cloud University in St. Cloud, Minn., resulted from an invitation the college's president extended me to visit the campus and look for what I call “poetic facts.”

As very often happens on such occasions, I found inspiration in the natural setting: The university, which is dominated by crisp, linear, modern architecture, is located on the banks of the Mississippi River at a spot that was once known as the last navigable upstream point on the river.

In this case, I worked with the topography of the campus, setting up a composition of offset granite slabs in a layered effect. From the primary vantage point overlooking the slabs – that is, from the university's student center looking across the way to the performing arts center – the slabs align in such a way that they mirror the natural sectional planes that cascade from the campus to the river's edge.





## Ballston Plaza

This fountain, completed in 1991 in Arlington, Va., was fabricated at the Cold Spring Granite Co. (one of the largest stone-quarrying companies in the world) using cut granite slabs. The original master plan called for a long planter in a location that was critical in terms of pedestrian traffic and movement through the space, but I saw it instead as the perfect place for a fountain.

My inspiration came from the original topography of the jobsite, which had been completely obliterated when the plaza was built. What is now a two-level parking structure was once a slope that flowed down along a series of what I would term sensuous contours through various layers of sedimentary rock.

The layered structure of the fountain and its sloped contours are there to express the form-memory of land that is now buried deep beneath this massive artificial structure.

The fountain itself is a 55-foot runnel that moves about 300 gallons per minute in each slot between the slabs – for me, a highly vigorous effect. The low wall's seating invites people toward the piece and to the sound of the water, again creating an opportunity for a close visual reading and intimate contact with water and stone.



how brought it to the surface.

The stones I use in my sculptural projects are gathered from abandoned quarries, derelict gravel pits or the reject piles of large fabrication operations – *never* from native rock formations. This concept of “aesthetic recycling” was inspired by George Nakashima, a woodworker who collected unusual, cast-off boards from around the world and turned them into beautiful furniture.

As I get down to business, I’ll look at a stone and contemplate its forms, then I consider where I might split it to emphasize a particular contour and express the character I see within the stone. In fact, I’ve found the best way to highlight the beauty of a contour is to give it a crisp plane that has clearly been placed by the artist’s hand. Or I might carve into that plane or consider ways to create a sense of line and space by juxtaposing a selected stone with other stones.

With those basic decisions made, the techniques I use are quite simple: I drill into the stone, set masons’ feathers and wedges and hammer away. It’s a fascinating process that is mostly a matter of sound: As I drive the wedges in with my hammer, I listen for changes and await the unique tearing sound that heralds a split. It’s hard work, but there’s a drama and excitement to it that sometimes makes me laugh out loud when the rock gives way.

And when the stone opens, it always reveals something that hasn’t ever been seen by human eyes before. It becomes something new by way of my artistic impulse, a process I’ve applied for the purpose of finding character and form within what nature has provided.

Once water is brought together with the stone, its character is both articulated and amplified: Colors are enriched, figures are accentuated and the opportunity for the interplay of light, sound and motion all become part of the conversation.



## City Place Fountain

The master plan for this plaza showed a generic “dandelion” fountain installed in this location. I felt that this form had become a visual cliché, so I suggested something different.

This resulting fountain is another example of what happens when you work with both the architectural sensibilities of the surrounding urban environment as well as native geological and hydrological features.

The buildings surrounding this plaza, set in Silver Springs, Md., are mostly Art Deco or modern. The rawness of the upright elements speaks to the granite escarpment upon which the city sits, while the sleekness of the water steps communes with the existing Art Deco architecture that inspired this urban renovation.

The dark-blue, mica-encrusted granite forms the treads of the water steps. This material was chosen in response to a passage in the journal of a city founder who wrote of a “spring glittering with mica and sand.”

The natural granite stones that flank the step structure take their cues from the visual flow through the space, tying into the architecture while contrasting with the formality of the steps and the naturalistic flavor of their glittery finish. To be sure, the steps themselves fit neatly with the architecture because of their clean lines, but they also reveal a wonderfully native character when observed up close.

The flow of water in this case is very subtle, just a few gallons per minute, creating an intimate feeling amidst the bustle of the surrounding urban environment.





## The Source Stone

This is one of my residential projects – and one of the most understated I've ever completed.

Situated outside of Pueblo on the lower Arkansas River, the design sprung from the clients' desire to feature water in a flagstone courtyard. I looked at the space and thought we could add some layers of experience by expanding the design with something that went beyond a flat waterfeature or reflecting pond.

I found the boulder in a field and liked its shape and character. Then I gave it a visual lift by carving a bit of material from each side of the stone to accentuate its horizontality.

In this case, the intervention is almost slight of hand: You don't really notice it at first. In addition, the stone itself is aligned with the direction of the river – a subtle means of connecting the work to its larger setting.



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## POOL/SPA HEATER

### Circle 125 on Reader Service Card



PENTAIR POOL PRODUCTS has added the MiniMax NT heater to its line of reliable, energy-efficient pool and spa heaters. Pre-wired for use with all major automatic control systems, the unit has a thermal efficiency in excess of 82%, fires up quickly and is available in 200,000, 250,000, 300,000 and 400,000 Btu models that use either natural gas or propane. There's also a low-NOx burner option. **Pentair Pool Products**, Sanford, NC.

## READY-TO-INSTALL WATERFALL

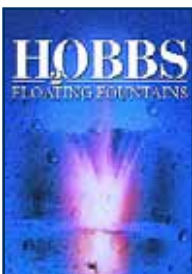
### Circle 126 on Reader Service Card

ROCK & WATER CREATIONS introduces The San Miguel, first in a series of all-in-one waterfeatures. Designed for quick, easy installation, the waterfall system is made of the same glass-fiber-reinforced concrete as the company's custom boulders and panels and offers realistic features and naturalistic sounds in a 600-to-750-lb structure measuring 5 feet wide by 4 feet long by 3 feet high. **Rock & Water Creations**, Fillmore, CA.



## FLOATING FOUNTAINS

### Circle 127 on Reader Service Card



HOBBS FLOATING FOUNTAINS has published a brochure on its line of floating fountains. The eight-page, full-color pamphlet offers background information on the company, its history and technology as well as details on a range of jets and multi-tiered fountains. Specifications are included, along with information on options such as lighting, wind compensation and freeze protection. **Hobbs Floating Fountains**, Atlanta, GA.

## MEDIEVAL-THEME CASTLE

### Circle 128 on Reader Service Card

VORTEX AQUATIC STRUCTURES offers The Castle as the centerpiece to its play-oriented Medieval Fantasy Splashpad system. The fully automated, interactive play structure includes a roof-top dumping bucket, two rising flags with flush-mounted pod sprays, six nozzle sprays, two waterfall spray bars and a pair of drawbridge spray wheels that rotate 360 degrees. **Vortex Aquatic Structures**, Montreal, Quebec, Canada.



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## POROUS-MATERIAL SEALER

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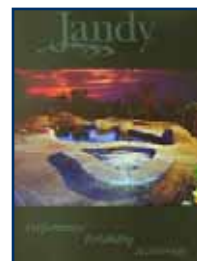


**SYSTEM DYNAMICS** offers StoneCare, a family of products designed to help reduce the maintenance associated with stains caused by minerals on porous materials such as plaster, natural stone, slate, flagstone, exposed aggregate and more. The core product is a water-based sealer that can be applied (even as the surface is curing) without changing the surface's appearance. **System Dynamics**, Scottsdale, AZ.

## POOL/SPA EQUIPMENT CATALOG

Circle 130 on Reader Service Card

**JANDY (WATER PIK TECHNOLOGY)** has published its 2003 Pool & Spa Products Catalog, a 222-page booklet covering the company's complete line of pumps, filters, controls, valves, waterfeatures, cleaners and Laars heaters. New products are highlighted, including a line of pumps and filters that make up complete system packages. There's also a complete parts index, a literature guide and web site information. **Jandy**, Petaluma, CA.



## UV STERILIZERS

Circle 131 on Reader Service Card



**EMPEROR AQUATICS** offers the SMART line of multiple-lamp UV sterilizers for applications requiring flow rates exceeding 100 gpm or water-


features with capacities greater than 15,000 gallons. Features include single-vessel/multiple-lamp arrays; UL-listed, long-life, GPH/T5-style 65-watt UV lamps; sealed, watertight power supplies; and durable, UV-resistant, heavy-wall plastic construction. **Emperor Aquatics**, Pottstown, PA.

## POOL TILE CATALOG

Circle 132 on Reader Service Card

**NATIONAL POOL TILE** has published a catalog on its complete lines of pool and spa tiles. The 40-page, full-color brochure covers dozens of patterns and possibilities, from solids and florals to specially textured and embossed tiles. Tips on mixing and matching are offered, as is information on gaining access to a web-based system that lets the designer play freely with styles and colors. **National Pool Tile**, Anaheim, CA.





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## INTERACTIVE WATERFEATURE CATALOG

### Circle 133 on Reader Service Card



**WATERPLAY** has published a 40-page, full-color catalog covering its line of interactive play features in a wide range of bright colors, exciting shapes and various shower configurations. Components are extra thick and tall to ensure safe play environments, and all are designed to turn flat, ordinary concrete slabs into inspiring, three-dimensional water worlds for children.

**Waterplay**, Penticton, British Columbia, Canada.

## RETRACTABLE ENCLOSURE

### Circle 134 on Reader Service Card

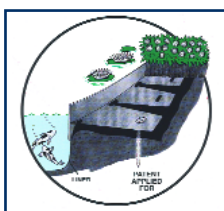


**ROLL-A-COVER** manufactures enclosures designed to protect and extend the use and safety of pools and spas as needed. The enclosures, which can be more than 40 feet wide, can extend to more than 90 feet in length and are made of Lexan and aluminum with stainless steel hardware, stay closed when the weather is chilly or inclement but roll back for open-air enjoyment when the weather is fair.

**Roll-A-Cover**, Bethany, CT.

## POND EDGING

### Circle 135 on Reader Service Card



**OLY-OLA SALES** offers the Edg-Keeper pond-edging system. Designed to keep gravel, bark and mulch out of ponds, protect liners from sun damage and maintain pond-edge contours for the long run, the vinyl material lends strength and stability to pond edges while allowing for designs that bring plants, rocks

or turf right up to the water's edge. Kits include steel anchoring stakes and connecting clips.

**Oly-Ola Sales**, Villa Park, IL.

## CHLORINE GENERATOR

### Circle 136 on Reader Service Card



**GOLDLINE CONTROLS** manufactures the Aqua Rite chlorine-generating system. NSF tested at 1.5 lbs of chlorine per day and approved for commercial pools, the system installs easily in any type of pool, produces 100% of the pool's chlorine requirement and creates no flow restrictions. Training for installers and technicians is offered, as are manuals, salt testers and cell cleaners.

**Goldline Controls**, La Mesa, CA.



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## MASONRY SAWS

### Circle 137 on Reader Service Card



**MULTIQUIP** offers Mason Pro masonry saws, providing high-quality cutting performance for a wide variety of materials – stone, ceramics, pavers, brick, block and other masonry products. Seven models are available, including three portables in the MP1 series for quick set-ups for vigorous cutting applications and four bench models in the MP2 series to tackle the most challenging jobs. **Multiquip**, Carson, CA.

## GRANITE SCULPTURES

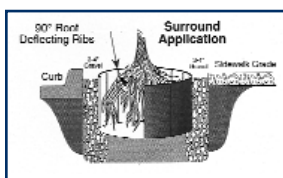
### Circle 138 on Reader Service Card

**STONE FOREST** offers hand-carved granite sculptures that combine the elegant simplicity of Japanese tradition with contemporary design. The granite lends each piece a presence and patina that cannot be realized using man-made materials. Each item is hand carved using hammers and chisels, so each features the individual character of the stone as well as the inspiration of the stone-cutter. **Stone Forest**, Santa Fe, NM.



## ROOT BARRIERS

### Circle 139 on Reader Service Card



**CENTURY PRODUCTS** offers the DWS series of root barrier rolls. Designed to prevent root intrusion that can cause damage to decks and landscapes, the flexible plastic, UV-stabilized system comes in 20-foot sections in varying widths. Panels can be used in both linear and surround applications and feature 90-degree root-reflecting ribs as well as root-impervious joiner strips. **Century Products**, Anaheim, CA.

## PORTABLE POWER CENTER

### Circle 140 on Reader Service Card

**CAL PUMP** introduces the PC50 power control center, featuring a 50-foot power cord that allows positioning of power and timers exactly where they're needed. The UL-listed, GFCI-protected unit has programmable digital timers that control two line-voltage outlets, while two additional outlets supply continuous power. There's also a low-voltage outlet with 150-watt capacity on a separate digital timer. **Cal Pump**, Sylmar, CA.



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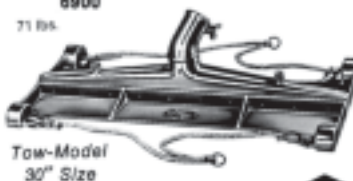
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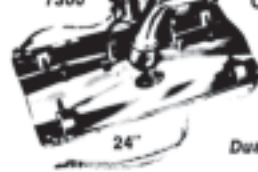
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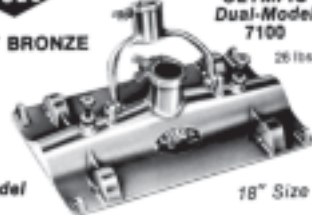


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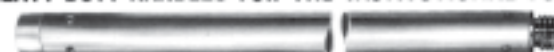
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## DECORATIVE CONTROL JOINTS

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W.R. MEADOWS offers Deck-O-Joint as a maximum-sealing, decorative control joint for concrete decks. Economical, long-lasting and chemically resistant, the product is available in several colors (tan, gray and white as well as black and redwood), will not whip or warp as it protects against deck cracking and buckling – and reduces damage that can be caused by water flowing through joints. **W.R. Meadows**, Hampshire, IL.

## CONCRETE CONSOLIDATORS

### Circle 142 on Reader Service Card

NORTHROCK INDUSTRIES announces a new line of backpack-mounted vibrators for consolidation of concrete in remote areas where electric power is unavailable or on sites where extra mobility is needed. The operator-friendly system, which swivels for right- or left-hand use, comes with a choice of 7-, 10- or 14-foot flexible shafts and with six heads of up to 2 inches in diameter. **Northrock Industries**, Medford, NY.



## POOL-CONTROL SYSTEM

### Circle 143 on Reader Service Card



BALBOA INSTRUMENTS offers The Pool Series, giving owners convenient remote and poolside control of vital functions at the touch of a button.

Features include freeze protection, programmable and manual control of a single two-speed pump or two one-speed pumps, outputs for multiple lights, adjustable heating, control of up to two actuator valves and diagnostic help. **Balboa Instruments**, Tustin, CA.

## EXPOSED-AGGREGATE FINISHES

### Circle 144 on Reader Service Card

PREMIX-MARBLETITE supplies the Marquis line of exposed-aggregate finishes for pool and spa interiors. The fade-, stain-, chemical- and slip-resistant finish comes in 11 standard colors and features durable mixtures of quartz and polymers designed for years of low-maintenance use and improved depth perception through the water. In addition, the material comes with a five-year warranty. **Premix-Marbletite**, Pompano Beach, FL.



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## CONTROLLER FOR DEHUMIDIFICATION

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**DECTRON** has introduced Supervis-Aire, a microprocessor-based monitor/control for its Dry-O-Tron line of heat-recovering dehumidifiers for use with indoor swimming pools. The device interfaces with other building-control systems and features user-friendly software that allows for easy set-up and troubleshooting of pool heating, space cooling/heating, heat recovery and other functions. **Dectron**, Roswell, GA.

## PENNSYLVANIA BLUESTONE

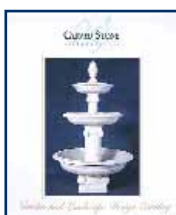
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**DELAWARE QUARRIES** offers fine dimensional and irregularly shaped Pennsylvania bluestone. With standard thicknesses from 1/2 to 2 inches and sizes ranging from 12 by 12 to 36 by 36 inches, the stone is available in three basic colors – quarry run gray, blue and lilac – and includes treads, sills, coping and tumbled products as well as special-order items such as bull-nose cuts. **Delaware Quarries**, New Hope, PA.



## GARDEN DECORATIONS

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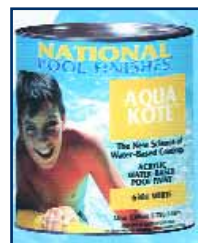


**CARVED STONE INT'L** has published a catalog covering its imported line of Indian and Chinese garden and landscape statuary and fixtures. The 24-page, full-color brochure features free-standing fountains, wall fountains, benches, tables, pots, planters, birdbaths, lanterns, pedestals, panels and more in a variety of styles in both sandstone and marble. Custom materials and styles are also available. **Carved Stone Int'l**, Carlsbad, CA.

## POOL PAINTS

Circle 148 on Reader Service Card

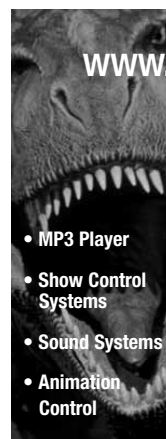
**NATIONAL POOL FINISHES** offers Aqua Kote, an acrylic, water-based paint for pool interiors. Available in five body colors (aqua, medium blue, white, royal blue and sky blue) with three detail colors (black, yellow and red), the paints cure quickly and allow for returning a pool to service in three days. Resistant to chemicals, the finish has excellent color retention – with no solvent fumes. **National Pool Finishes**, New Brunswick, NJ.



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## PULSE METERING PUMP

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NEPTUNE CHEMICAL PUMP CO. introduces the Series PZ pulse metering pump. Designed for accurate, reliable injection of a wide range of pool/spa chemicals, the device offers stable chemical delivery through voltage fluctuations and can operate at any system voltage between 94 and 264 VAC. The number of pulses per minute can easily be adjusted from 15 to 300. **Neptune Chemical Pump Co.**, Lansdale, PA.

## LIGHTING FIXTURE LINE

Circle 150 on Reader Service Card



BRONZELITE has introduced the DB-5000 line of inground lighting fixtures. Rugged, durable and water-resistant, the units were designed with the needs of architects and engineers as well as installers and maintenance staff in mind. Lighting components offer easy access and maintenance, and the broad line of fixtures is complemented by a wide range of accessories. **Bronzelite**, Littlestown, PA.

## FORMING FOR CURVED CONCRETE

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FIBERTECH POLYMERS has introduced Concrete FormingBoard, a flexible, no-soak, easy-releasing composite board that leaves smooth, clean surfaces on formed concrete while lowering labor costs and increasing design options. Made of recycled materials, the product is ideal for setting decorative, curved edges on patios, pool/spa decks, walkways, curbs, gutters and driveways. **FiberTech Polymers**, Newport Beach, CA.

ing decorative, curved edges on patios, pool/spa decks, walkways, curbs, gutters and driveways. **FiberTech Polymers**, Newport Beach, CA.

## DEBRIS REMOVAL SYSTEM

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PARAMOUNT POOL & SPA SYSTEMS offers the MDX Debris Removal System. Tested by an independent laboratory and reviewed and accepted by IAPMO, the system offers an alternative to conventional pool/spa drains while providing multiple layers of anti-entrapment protection. The system compresses and directs debris to the outlet port for quick removal with less likelihood of blockage. **Paramount Pool & Spa Systems**, Tempe, AZ.



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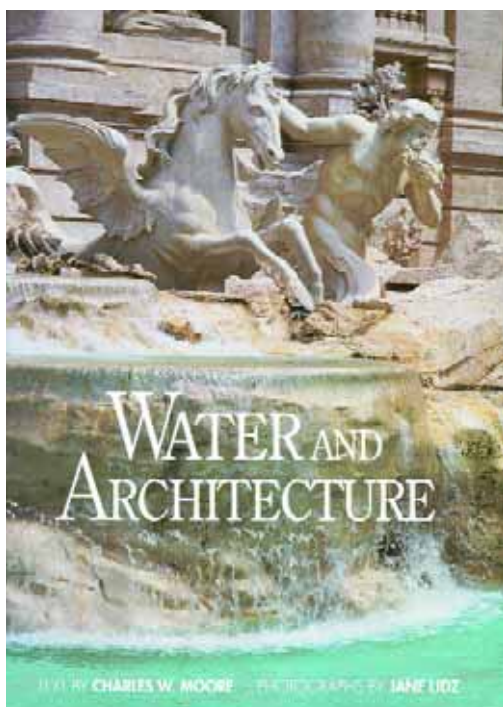


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## Building by Water

When I first picked up *Water and Architecture* by Charles W. Moore (published by Harry H. Abrams in 1994), I thought I'd found the perfect resource for those of us who design and build contained, controlled bodies of water. As I delved into this book's incredibly well-illustrated 224 pages, however, for a short time I worried that the text was mostly irrelevant to the working lives of watershapers.

Ultimately, however, I found the text to be very helpful – even if it wasn't in the manner I had initially thought.

I was disheartened initially because the text seemed so broad in its coverage of water and architecture – and so rooted in history and philosophy – as to be of little practical use. Specifically, Moore deals with subjects as grand as rivers, oceans, harbors and architectural history in very broad and almost sociological terms, and it seemed that I would find little I could apply in my own work.

I soon came to understand, however, that what this text was really about was how water and architecture go hand in hand to create some of the most remarkable environments ever crafted by human beings. And from that broader perspective, my mind was opened to wonderful explorations of spectacular human achievements – discussions that make this book a must for any watershaper concerned with expanding his or her knowledge and perspective of what's at stake in our daily activities.

And there is a section of the book that deals specifically with still-water systems, including swimming pools, reflecting pools and ponds. For the most part, this is an examination of the power of reflection and of the value of the stillness that water can provide. Most prominently, Moore

considers the Taj Mahal and asks whether we'd pay as much attention to it had it been built without its reflecting pools. How diminished that space would be!

But he also deals with water on the grandest of scales as well. In a section describing architecture by the sea, for example, Moore cites Hong Kong's harbor as a prime example of an entire city that gains its character from the water, discussing the way the water offers a tranquility that counterbalances the bustle of the city that rises from its shores.

Throughout the book, Moore offers similar observations and insights into an array of remarkably famous settings and their attendant watershapes, including the canals of Venice, the fountains at Villa d'Este, the waterworks at the Alhambra and a few more modern examples, such as San Antonio's famous Riverwalk and, most profoundly, Frank Lloyd Wright's Fallingwater, which Moore cites as a fantastic confirmation of the power and importance of the use of water in human environments.

He also discusses monumental uses of water and, for example, the Jefferson Memorial, which gains much of its drama and character by way of its proximity to water. He also considers the way water is used in urban environments to combat claustrophobia, and how it is used in intimate spaces to bring a sense of the natural world into mankind's decidedly unnatural settings.

One of the most fascinating parts of the book concerns the famous Italian engineer Bernard Forest de Belidor, who from 1737 to 1753 published four volumes devoted to what probably could've been termed "watershaping" had the phrase been around back then. Moore examines Belidor's ground-breaking descriptions of basic water effects such as sheeting waterfalls, water cannons, basins, cascades, water organs, grottos and more, pointing out that this is very much the same set of principles and effects we use today.

His point is clearly that designers and architects working with water today are not creating anything particularly new under the sun, but instead are working as interpreters of a great tradition within a broader architectural field. Indeed, Moore's achievement here is to remind us forcefully that today's watershapers are in fact expanding on centuries of design and art history. The discussions in his book may not be as practical as those in some of the other texts covered in this column, but they are inspiring and vastly informative nonetheless. **WS**

*Mike Farley is a landscape architect with 20 years of experience and is currently a design/project manager for Leisure Living Pools of Frisco, Texas. 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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