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Design • Engineering • Construction

Volume 5  
Number 7  
July 2003  
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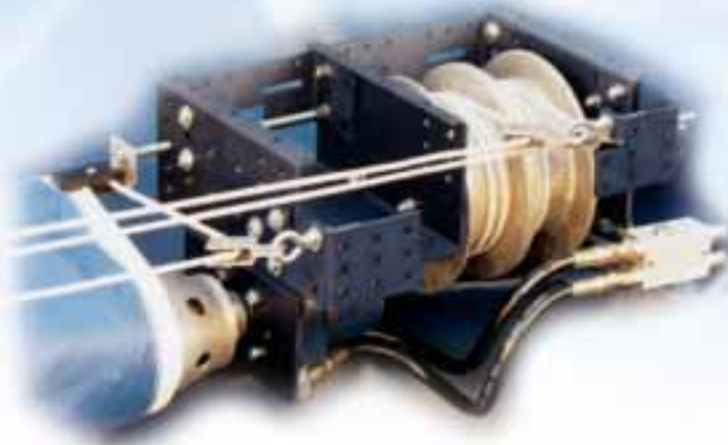
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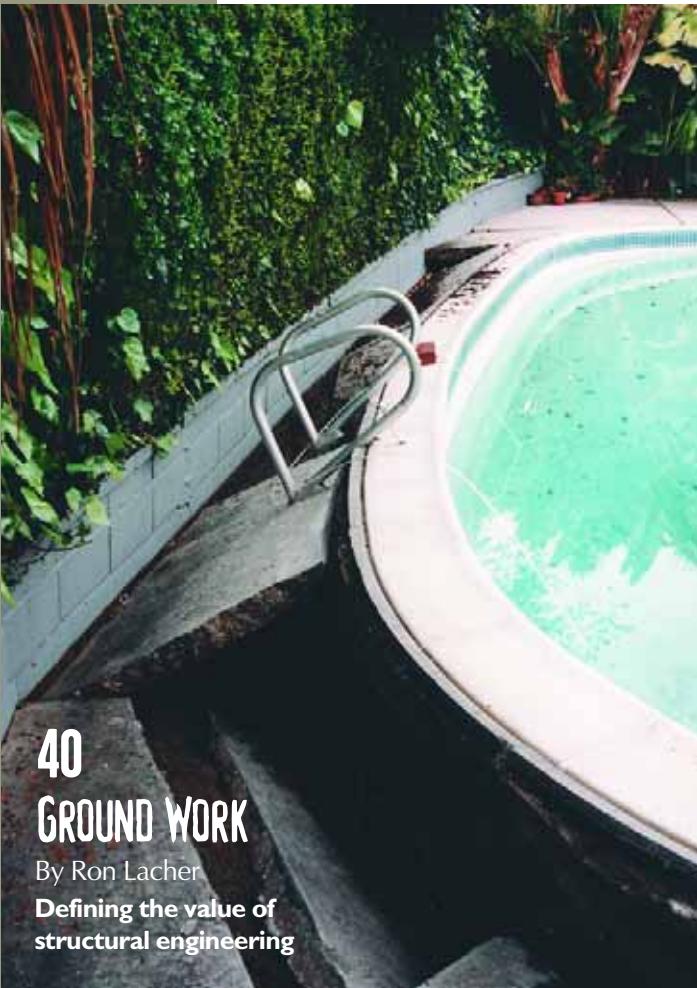


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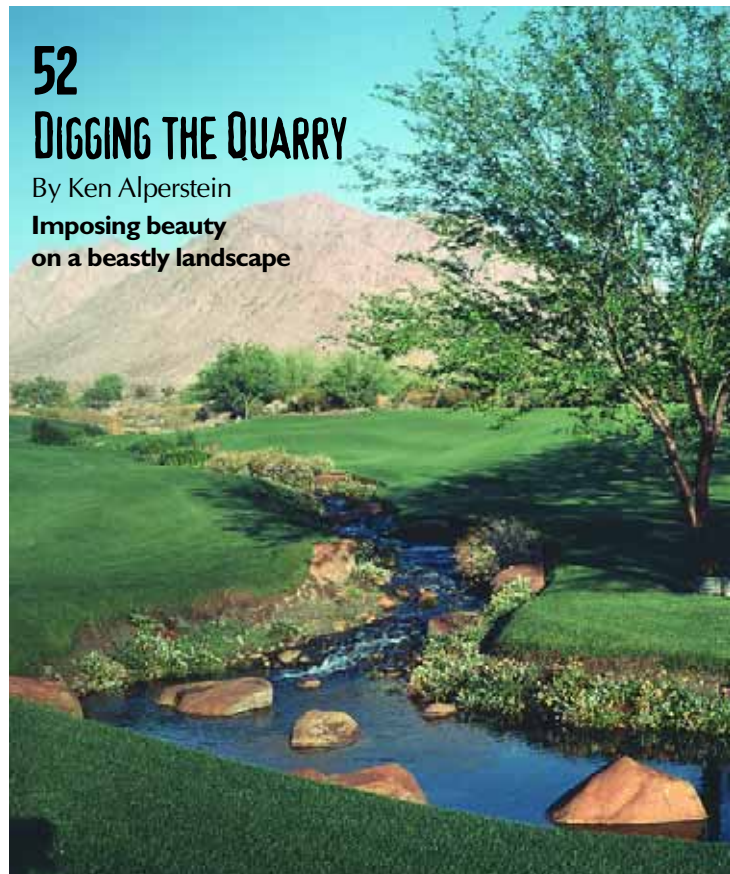


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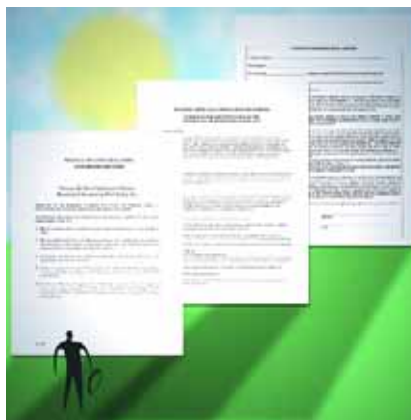
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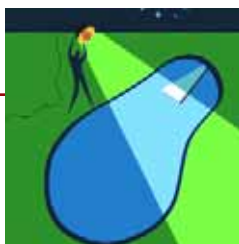
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**Photo by Tom Brewster, Palm Springs, Calif.,  
courtesy Pinnacle Design Co., Palm Desert and San Diego, Calif.**

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## A Hidden Place

Earlier this year, I was treated to a guided tour of The Quarry Golf Club in La Quinta, Calif., by landscape architect Ken Alperstein.

Ken works for Pinnacle Design Co. and is a specialist in the art of golf-course watershaping. At the time, we were in the early stages of discussing an article about this project – and the result of our communications appears in this issue, starting on page 52.

Although I had seen pictures of the course and was also familiar with areas of the lower Coachella Valley in which La Quinta sits in its beautiful mountain canyon, I was not prepared for what was, frankly, the nearly giddy awe I experienced while cruising around the links in a golf cart. I'll cop to getting pretty excited about beautiful settings of all sorts, but this place was basically off the charts.

It was a beautiful winter's day, with desert temperatures already in the high 80s. A light breeze rustled through the fan palms, and the arid mountain terrain practically glowed in the brilliant desert sunshine.

I've been to my fair share of golf courses through the years – although infrequently on such nice ones – but I've never seen any course that comes even close to The Quarry: The golf holes were sublimely contoured and beautifully groomed, and each one had its own character, both aesthetically and in the sorts of challenges offered to players.

What caught my eye as we lingered on the course that day, however, was how integral the watershapes were to the overall environment. The streams, waterfalls and ponds had been so expertly and artistically designed and installed that they are *the* defining feature of the course's considerable beauty.

I was lucky in that not many people ever get to see this hidden place. The club's membership consists of an assortment of the wealthiest of duffers, many of whom live in estate homes adjacent to the course. It's a ritzy enclave to be sure, and although I can fully appreciate the prerogative of anyone to be a part of such an exclusive and private club, I do wish that more people could partake of this dramatic example of just how beautiful landscaping and water can be when they're done very nearly to perfection.

\* \* \*

For years now, Camma Barsily, our National Sales Manager, has used some form of the following line when explaining what *WaterShapes* is all about: "We cover every kind of body of water, except birdbaths." It's a durable phrase, and truer words were never spoken – until this issue, that is.

On page 34, Delaware-based birding enthusiast Bill Fintel, owner of Avian Aquatics – a firm that specializes in, yes, birdbaths – offers a compellingly detailed discussion of the ins and outs of designing and building bodies of water that attract wild birds.

There's certainly more to birdbaths than anyone outside the birding world might think, and I for one have gained an even greater appreciation for the many benefits water can lend to a space – in this case by attracting our fine-feathered friends.

But now, sadly, my friend Camma must retire one of the favorite arrows in her quiver. Sorry!

*Eric Herman*

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**Ron Dirsmith** is principal architect and co-founder of The Dirsmith Group, an architecture firm based in Highland Park, Ill., with operations worldwide. He and wife Suzanne established the firm in 1971 following employment with the prestigious firms Perkins and Will and Ed Dart Inc. He has a BS in Architectural Engineering and a Masters in Architecture and Design from the University of Illinois. He is also a Fellow in Architecture of the American Academy in Rome, which for more than 100 years has been a research and study center for America's most promising artists and scholars. Dirsmith is one of only 172 architects to have been granted this honor. **Suzanne Roe Dirsmith**, president of the firm, holds a BS in Education from the University of Illinois and a Masters in Education from

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**Bill Fintel** is founder and president of Avian Aquatics, a Milton, Del.-based supplier of water-shape systems and supplies designed to attract wild birds. A career chemical engineer with Dupont, Fintel founded Avian Aquatics in 1992 after spending years as a bird watcher. The firm offers off-the-shelf birdbath systems and a series of kits, and Fintel has also worked closely with landscape architects and designers in setting up

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custom stream and pond installations across the United States – all designed to attract birds. In addition, he frequently conducts field trips and birding classes for local groups.

**Ron Lacher** is president of Pool Engineering Inc., in Anaheim, Calif. A licensed civil engineer, he spent the first ten years of his career managing large-scale construction projects for a variety of governmental agencies before becoming a pool builder in Southern California. In 1992, Lacher founded Pool Engineering, which specializes in developing structural and engineering plans. Since then, the firm has provided structural documents and details for thousands of residential and commercial swimming pools. He regularly serves as a field expert for California's Contractor State


License Board, insurance companies, homeowners and pool-construction companies.

**Ken Alperstein** is co-founder of Pinnacle Design, a golf-course architecture firm with offices in Palm Desert and San Diego, Calif. He is a 17-year veteran of the landscape-architecture industry and has specialized in golf course landscaping since 1989. Alperstein and his partners, Ron Gregory and Bill Kortsch, founded Pinnacle to serve the highly specialized golf course design industry. The company's portfolio includes high-end championship golf courses, clubhouses and grounds throughout the Western United States – including several courses rated in the top 100 in the United States by *Golf Digest* and *Golf* magazines.

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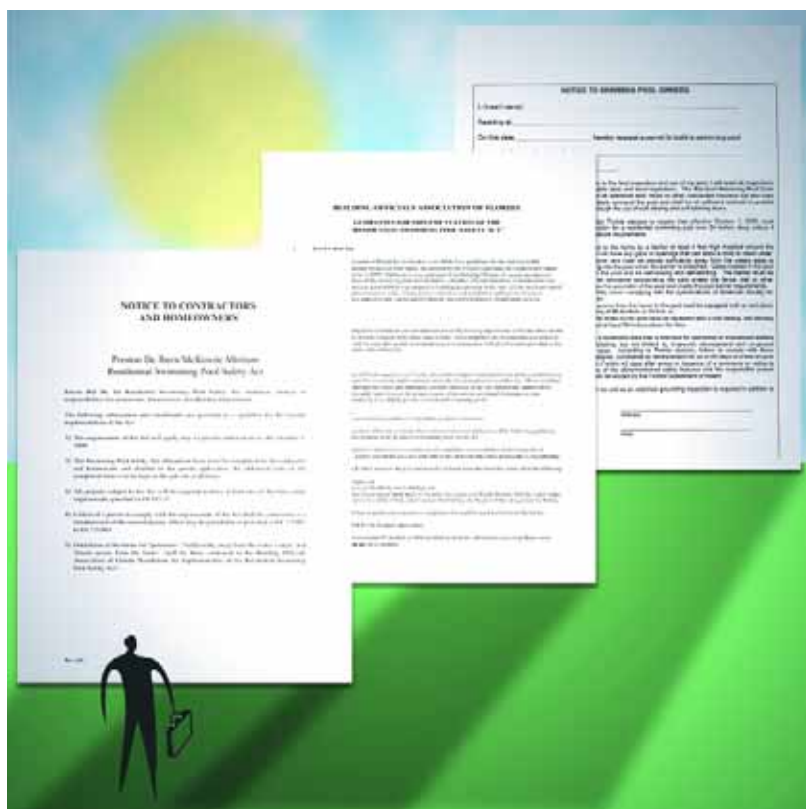
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## Permitting the Process

**A**s I discussed in the June installment of this column, the construction of a backyard watershape environment requires careful and clear coordination – and sensitivity to the fact that watching the process unfold can be unpleasant or even traumatic for your clients.

Without a doubt, the key to managing the process so that your clients don't become unhappy requires purposeful, up-front communication that sets realistic expectations for how the project will progress – and when. Similarly, you should also set up expectations for the inevitable changes that will arise as the project moves forward.

That all may seem obvious, but it's plain to any casual observer that the importance of managing expectations is, unfortunately and amazingly, missed by a great many designers and builders. Here's the key: To set up realistic expectations with other people, you must have your own grip on reality. Otherwise, there is no way you and your clients can ever wind up on the same page.

### HURRY UP AND WAIT

As a dramatic and important example of how off track things can get, let's start by considering what's involved in obtaining building permits – and how much variability there is in the construction-permitting process in different parts of the country.

Where I live and work in Florida, the requirements for obtaining building permits for swimming pools are far more extensive and stringent than those observed in many other parts of the country. Even within the Sunshine State,

the permitting process will vary some from city to city – but it almost always seems tougher here compared to the many other jurisdictions in which I've worked in other states.

The upshot in Florida is that when you're setting up a project, the permitting process can represent a significant block of time that is largely out of your control. I'll go so far as to say that in some areas in the state, the authorities seem quite enamored of their power to reject or deny. The contractor has no real power, and for that reason it's never a bad idea to set clients up with an expectation that lining things up will take an uncertain amount of time.

That's why I've always preferred to start the project "clock" based on the acquisition of the necessary permits – *not* the date on which the contract was signed.

Others in the trade will debate this policy with me, but it's been my experience that my clients often go through a lengthy, complex process to arrive at the point of signing a contract: interviews with multiple contractors, debates over various features or design options, hard work in budgeting and weighing costs against true desires. It's a big decision, and there's something of a standing joke that when these folks sign on the dotted line, they're generally expecting you to start digging that evening – or on the next day at the latest.

This is why I am very clear in my discussions with clients, well ahead of contract signing, in describing what the process is like in their specific area. Yes, there are places where this isn't much of an issue – Texas, for example, where I've heard you can obtain approvals in a matter of days or even hours in some cases. It's always a matter of weeks where I am, however, and can take as long as three long months. (See the sidebar on page 14 for more timeline-extendors.)

Back home in Florida (which I'll stick with as an example because I know it best), building departments in most places require sealed structural plans drawn by a licensed engineer. Because those plans won't be created until there's a signed contract in hand, the time involved in generating those drawings must be added to the time tied up in the permitting process, which means it's not unusual for the plan/permit phase to stretch way beyond the limits of clients' patience.

Giving them all the bad news up front is what I call making them "pre-annoyed." My clients may not like what I'm telling them, but they'll be far less unhappy if they're given the opportuni-





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ty to consider the real time frame and factor it into their thinking.

### OPTIMISTICALLY SPEAKING

These problems come up despite the fact that most contractors in the business know how long it takes to obtain permits in their working areas. A big reason why so many professionals underestimate the

time frames – even though they should know better – is that they are overly optimistic and live in the hope that things are going to break their way.

Perhaps it's a matter, cutting back to my June column about open and honest communication, that these contractors are afraid to tell the whole truth for fear of having clients seek better (and even less-truth-

ful) schedules elsewhere. But I prefer to think that this "optimism" is usually a sign that few contractors, busy in the day-to-day flow, pay much direct attention to just how long these processes really take.

If you find yourself getting caught in situations in which you are frequently underestimating the duration of the plans-and-permits phase, I encourage you to look at the dates on which contracts are signed and the dates when permits are actually obtained. You may be surprised at what you see.

Sometimes, errors made in setting up expectations may be innocent, but it doesn't make them less harmful. And make no mistake: There are some clients who will become more than a wee bit agitated when their self-established expectations aren't being met – a key reason I don't want to leave them guessing.

Just this week, for example, a design client called me to express outrage that the selected contractor has not been able to get started in a timely fashion. The contractor, one of the biggest in the area, had originally told the client that construction would start six to eight weeks after contract signing. At this writing, it's been 12 weeks, and the contractor is nowhere near ready to go.

Of course, there are all sorts of reasons for the delays, including a city requirement that called for raising the equipment pad several inches above grade – something the contractor says came out of the blue.

The bad news to the client was not only the delay, but an added cost. The client called the city and asked if the contractor should've known about the requirement and was told that, yes, the contractor certainly should've known – which speaks eloquently to the fact that building-department officials are just as adept as contractors at covering their behinds.

By the time the client had reached the point of calling me, he was so livid that he wanted to fire the contractor. I advised against that step, given that it wouldn't make the requirement go away and that bringing in a new contractor would only further delay the project – likely at a premium in cost and with added stress.

The requirement for elevating the pad may have been arbitrary, but there's no doubt the contractor should have consid-

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## AQUA CULTURE

ered more carefully what the client was expecting and done a better job of keeping him in the loop as circumstances changed.

### LAYING OUT

The notion that situations change unexpectedly and that you need to keep clients apprised of what's going on is terribly important. Indeed, change is inevitable in the vast majority of projects, and how you manage it can have everything to do with your success in keeping the client happy – and protecting your profit margins as well.

The challenge is that changes take many forms and by their very nature present issues that can only be handled on a case-by-case basis. If there is one rule that applies to most changes, however, it's that they're best accommodated earlier in the process rather than later.

That's why another critical step in the early going of a project is the initial site layout. This is when we stake out the body of water and the other major elements of the project so that everyone – clients especially – can see where everything is going.

There are many techniques for creating a working layout, and I've found that no matter which method you use, whether it's spray painting the ground or laying things out with strings and stakes, it's critical that the structures be laid out with care and precision. It's amazing how a mistake in one phase of a project transmits to and is amplified in subsequent phases. Even though errors in layout can be caught down the line, it's obviously preferable to start out accurately.

Once the project is laid out, it's not uncommon for customers to reconsider size, placement or both. Of course there are costs associated with changing things at this point, especially if the changes are significant, but those costs are far less extreme when you're working with spray-painted lines than they are when you need to jack-hammer steel, plumbing and concrete to do what's required.

I use paint or string in laying out pools and find that either method works in helping clients visualize the space. Often, they'll say that the watershape is somewhat smaller than they'd been expecting – and then when you dig it, they think it's way too big because they can't "visually" compensate for over-dig once the

big hole has been dug.

Always at the ready, I prepare the client for this shift in perception. The last thing I want is a knee-jerk reaction and an unnecessary set of change orders. That said, however, *this* is when I expect and hope that clients will be making any significant adjustments.

I suppose it may be different for companies that work at mass-producing their swimming pools based more or less on standard templates, but in my experience I can comfortably say that there are *always* changes, no exceptions. And because addendums to plans are inevitable, it's always important to anticipate plan changes and manage expectations of how they'll affect both price and the construction process.

Continued on page 16

## LOCAL LOGISTICS

In some areas of my home state of Florida, there's an added step in the permit process – the so-called "Class 1" permit – which must be obtained before the construction permit can be pulled. This step seems to have no other purpose than to generate an additional licensing fee.

There are other jurisdictions that further attenuate the process by requiring you to send letters to all neighbors in the immediate area to notify them of the pending inconveniences of construction.

And the plan process can be dragged out even further if the pool is going in as part of new-home construction or as part of an extensive remodel, which in both cases you need to seek a whole separate layer of approvals for the overall construction that must come ahead of the watershape permit.

Wherever there's a way to drag out the process, there's generally a regulatory agency of one sort or another that's happy to get involved – thus making it even more critical to get up to speed yourself on what can happen so you can be crystal clear in working with your clients, especially when they're champing at the bit to see their project get under way!

– B.V.B.



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## FOR THE GOOD

Because of the type of work that we do in constructing significant structures and environments around clients' homes, we need to understand that changes are the norm – and that we can make money on them. I say this because contractors are often so focused on getting to the end of a project that they frequently become annoyed or even angry with clients who want changes.

I argue that changes should never upset us and that we should instead be looking at those changes as opportunities to expand projects and to give the client more of what they want. Welcoming changes in this way requires a shift in mindset for many watershapers. At the very least, you need to be aware of the inevitability of changes and set up terms for accommodating them ahead of time.

My view is that clients who ask for

changes should know going in that they'll pay for the cost of changing the plans as well as making the changes on site – and that the schedule will be affected, often significantly. I'll go into great detail, explaining all of the steps required to implement changes, and I'll begin that discussion well before clients have a chance to reconsider the design.

I know many well-intentioned contractors who let changes go without much discussion in the belief that they're making enough on the job to comfortably absorb the alterations. They do so, I suppose, in the belief that doing so will make their clients happy.

I respect those good intentions, but unfortunately, the result is that the clients often don't fully appreciate the change, don't expect an increase in the duration of the project, end up getting impatient with the process and, for no good reason at all, conclude by eating a good portion of the contractor's margin.

A good, simple addendum spells out a change and its ramifications with respect to cost and timing. And even if you are giving a good client a change free of charge, that gesture should still be explained in such a way that the clients appreciate the benefit they're receiving and understand that the change, even if it's small, will likely add days or more to the project's duration.

Just in practical business terms, I'd even argue that changes that *don't* require time or money should *still* be approved in writing and always be included with the project paperwork.

## WORKING WITHIN BOUNDS

The other side of the addendum issue, of course, is that no client ever wants to be "addendumed" to death. That's why in my own projects I try to anticipate the typical kinds of changes and set things up so not every change results in another addendum.

One area where this is particularly applicable has to do with fences around swimming pools.

In many areas, building codes require fences around pools, and it's known from the outset of the project that someone will either put up a fence or repair an existing fence. If that's not defined as part of the scope of work, however, or if the pool

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contractor isn't specifically licensed to do that sort of work, the issue of the fence might fall by the wayside until the project nears completion.

When this happens, it's unlikely that clients will be happy about having to pay hundreds or even thousands of unanticipated dollars for something that should have been identified as part of the project from the start. I believe it is incumbent on the contractor to bring such issues to the attention of the client early on so that needless addendums can be avoided down the line.

Unlike the weird requirement for the elevated equipment pad mentioned above, many of these things *don't* come out of the blue.

What I've found is that it's one thing to learn from experience and quite another to *apply* what we've learned. In other words, designers and contractors who've been at it a while tend not to be surprised when these things crop up. What I'm arguing for is taking that experience and using it to prepare clients

for what might be coming in as forthright and direct a way as possible.

If you can spell it all out, alert your clients to the twists and turns of the plan-and-permit process and to the fact that changes to the original plans will cost them money, the page your client is on will have the same number on the bottom as the one you're on, and the greater will be the likelihood that the project will move forward without undue stress.

With those realistic expectations firmly in place, both you and your clients will be well prepared to move into the construction phase on solid footing. **WS**

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

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## Maples in the Garden

If I could point to one plant that will consistently stand out in just about any garden, it would have to be the maple. Virtually no Asian-style garden would be complete without one, and they fit beautifully into gardens of many other styles as well.

I particularly like pairing maples with watershapes because of their tendency to soften the edges of typical hardscapes and the way they are reflected by the water. When placed well, a specimen or single maple can indeed be a key focal point in any design.

There are so many species and varieties of maples that I couldn't possibly cover them all here. What I can and will focus on, however, are those that work particularly well as specimens that can set themselves apart in any garden.

### ALL ABOUT MAPLES

In broad terms, maples – known as *Acer* in the plant kingdom – are deciduous trees and shrubs that can, depending upon variety, be placed in anything from full sun to partial shade.

Even though it's usually a good idea to minimize the use of deciduous plants around watershapes, I've found that maples are a great exception to the rule. True, they can add considerably to the maintenance burden during the fall, but the graceful, statuesque form they offer through the rest of the year is a stunning complement or accent to almost any watershape.

EVEN THOUGH IT'S USUALLY A GOOD IDEA TO MINIMIZE THE USE OF DECIDUOUS PLANTS AROUND WATERSHAPES, I'VE FOUND THAT MAPLES ARE A GREAT EXCEPTION TO THE RULE.

Maples (particularly the larger varieties) are notorious for invasive root systems that make many of them questionable around watershapes. But the root systems of the particular varieties I'll be mentioning below are typically noninvasive, making them wonderful natural companions to watershapes. As always, check with your local nursery or a good garden guide for the characteristics of the specific variety you intend to plant.

Availability is also an issue with maples. Typically, your local nurseries carry only specimens and varieties that are established performers in your area. If you're looking for a variety that isn't carried, there's probably a reason – that is, the particular variety you're after may not thrive in your area and nurseries are unlikely to carry plants with which clients will not be successful.

By the same token, it may simply be that your local suppliers have never heard of or tried the variety you're after and recognize little demand for it. As I've suggested before in this column, be a trailblazer: It's worth asking and, in some cases, pushing your nurseries to try new plants!

And those choices are many. Maples come in all shapes and sizes and in a variety of colors – and tend to be among the most striking of all fall-foliage plants, particularly in colder climates. The leaf colors range from light-yellow and dark greens to bronzes and burgundies, and many are variegated, some white with green and others burgundy and green along with many other combinations. The choices are extensive, and there are also varieties that feature colorful bark that can become a real highlight in a winter landscape.

### FAVORITE MAPLES

One last point before I get to my favorite maples: The smaller varieties are particularly popular in Asian gardens, where their pruning approaches an art form. To be blunt, my experience is that most "tree trimmers" don't understand maples well enough to maintain the artistic, planar form that can set maples apart.

If you plan on installing a maple in a client's garden and having it maintained in a way that expresses its artistic po-



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tential for the long haul, it's a good idea to find a pruning specialist who is skilled in this arena. It can make all the difference between a spectacular plant and one you want to rip out because it looks so bad. It can also make quite a difference in your business and reputation as your clients come to see that you care about more than just the bottom line.

Here are a few of my favorite maples – those I've planted for clients and those I've planted in my own garden as well. Most of these trees will tend to be more expensive than other varieties, but they are well worth the investment.

► **Acer palmatum (Japanese Maple).**  
This is an extremely large category of

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plants and offers varieties in a wide range of sizes and colors. Most could reach a mature size of 20 feet, but they are usually pruned to stay under ten feet because smaller specimens create more visual interest, especially when well shaped and cared for.

These trees are ideal for small gardens and those with lots of partial shade. They are also good container plants, although they'll always do better when planted in the ground. The genus and species name (*Acer palmatum*) denotes the green leaf variety. Others in this family are further identified with varietal names:

• **'Atropurpureum' (Red Japanese Maple).** This variety is a great addition to a space where you need contrasting colors. I've planted them singly against a wall surrounded by only groundcovers (these are particularly striking when placed against great paint colors that truly show them off), or among other foliage colors in a more lush landscape.

These trees are a good substitute for Purple Leaf Plums in spots that may be too shady for the plums. Surrounding them with light-green foliage or even grey foliage creates dramatic effects – but if you want something subtler, surround them with medium- to dark-green plants. Just make sure these plants have vertical room to grow, as they can reach heights of 20 to 30 feet if allowed to do so.

• **'Bloodgood.'** This is a particularly good variety and is visually similar to 'Atropurpureum.' It will want to grow to about 15 feet tall, but it can be kept smaller with pruning.

• **'Dissectum' (Threadleaf Maple).** This fine-toothed, green-leaf maple is a staple in most Japanese gardens. It's a small tree, typically reaching just five- or

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One of the joys of my own backyard is this variegated box elder – one of three I planted many years ago. I value them particularly for the way they brighten up shady areas of any garden.



Figure 1

six-foot height at maturity. It's also quite graceful, its branches having a gentle weeping form and a very soft appearance.

I like placing these at the edge of water-shapes, particularly small ponds and natural streams. I also see these as ideal for placement near or in contemporary reflecting pools or ponds that catch reflections of tree and sky. In fact, this is a case where each specimen should have its own visual space, meaning I would not overuse them in a garden and would place each one so that it is viewed apart from others.

Please remember, however, that there are no hard and fast rules for landscaping. Although I haven't found the right situation yet, there may be a design that calls for massing maples.

• **'Dissectum Atropurpureum' (Red Threadleaf Maple).** This is the bur-

gundy-leaved variety of the threadleaf maple, and I've also successfully used a variety that's known as 'Dissectum Red Dragon.' Both types make great individual specimens.

Even more than with the green-leaf 'Dissectum,' these maples should be used sparingly, as their color and unique nature can be overdone if too many specimens are placed in one setting. I've tended to use them in designs that call for plants that will stay relatively small or that are being set up in shadier locations that need a focal point or some contrast to green plants.

• **'Sango Kaku' (Coral Bark Maple).** I discovered this variety purely by accident while roaming through a selection of 'Dissectum' one day. One of these plants had been placed inadvertently with the other maples, but I was intrigued by its unusual bark color and immediately researched its characteristics. (I always love uncovering something I haven't seen anywhere else.)

What I learned is that this is an upright grower with green leaves and that it is at its best in cold climate. Since then, I've planted these trees at projects near the

MAPLES COME IN ALL SHAPES AND SIZES  
AND IN A VARIETY OF COLORS — AND TEND  
TO BE AMONG THE MOST STRIKING OF ALL  
FALL-FOLIAGE PLANTS.



beach in Santa Monica and up in the mountains at Lake Arrowhead, where it becomes a winter focal point. The coral-colored bark is especially striking against the snow at Lake Arrowhead, but it stands out year 'round in settings where most everything else has dull, brown bark.

► **Acer negundo 'Variegatum' (Variegated Box Elder).** When I was taking plant-identification classes some 15 years ago, the school I attended had a long walkway planted on either side with these trees. This was during the winter months, and the trees looked dead.

As soon as they leafed out, however, it was clear to me that this would become one of my all-time favorites: The leaves were mostly white, with a small dash of green in the center of the leaves, and no matter where I looked in the surrounding landscape, my eye always came back to these spectacular trees.

Five years later, I found three 15-gallon specimens in a nursery and quickly scooped them up. They are still the most stunning plants in my garden (Figure 1) and surprise me each year with new characteristics. What I didn't know when I first viewed them at school was that they grow "weeping pods" that give the tree a weeping appearance, even though the branching structure is upright.

These trees can get to be 20 to 30 feet tall, but they can easily be pruned to stay under 15 feet. They're well suited to shade and are very effectively used under the canopy of larger trees – the benefit being that they brighten up shadier areas of any garden.

The biggest problem with these plants is that they are now extremely difficult to get. I know of only two growers in the United States that propagate them, and in order to get one today, I'd have to order 200 at once. I can only wish I had that kind of space!

• **'Flamingo.'** This variety of variegated box elder is more commonly available than 'Variegatum' and is similar in nature – but with a dash of coral pink on its leaves. To my eye, the coral pink detracts somewhat from the striking appearance of the white leaves, but it's a reasonable

alternative if you can't find the real thing.

I encourage you to try these varieties or inquire with your local nursery about other varieties they might carry. There are very few designs in which maples would not be welcome in one form or another. And if you have a favorite you particularly like, please let me know: I'm always on the lookout for something new! **WS**

**Stephanie Rose** runs Stephanie Rose Landscape Design in Encino, Calif. A specialist in residential garden design, her projects often include collaboration with custom pool builders. If you have a specific question about landscaping (or simply want to exchange ideas), e-mail her at [sroseld@earthlink.net](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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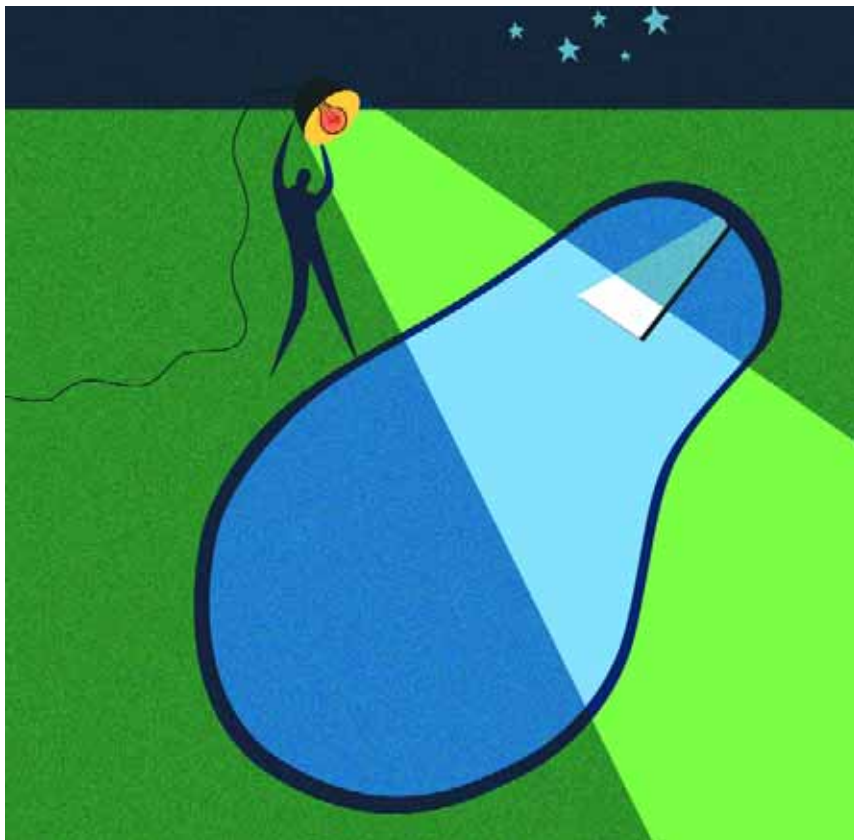
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## Good To Glow

For the most part, the designers and builders of pools, spas and other watershapes visualize their projects in full sun, install them during daylight hours and seldom (if ever) see them after the sun goes down.

That's both a problem and a shame, and it's reflected in the fact that the run of projects you encounter by mainline pool-industry folks – and, to a lesser extent, by people from the landscape trades – tend to treat the lighting of exterior spaces as an afterthought if it's really thought about at all.

In fact, I'll go so far to say that one of the very *worst* aspects of most pool projects is the lighting. And that's true both for lights installed inside watershapes and for landscape lighting placed nearby. All too often, what you see is an assortment of hot spots, lots of glare and an almost uniform lack of any design flair.

To be sure, some of the newer lighting products, including various low-voltage systems and fiberoptics, have raised design consciousness and improved things somewhat by virtue of increasing the range of product choices while making installation a bit easier. Still, it's an area where great and necessary improvement is possible.

MAINLINE POOL INDUSTRY FOLKS — AND, TO A LESSER EXTENT, PEOPLE FROM THE LANDSCAPE TRADES — TEND TO TREAT LIGHTING OF EXTERIOR SPACES AS AN AFTERTHOUGHT IF IT'S REALLY THOUGHT ABOUT AT ALL.

### IN THE DARK

I think we should all resolve to do better and to learn more about what it takes to design and specify lighting systems that do a better job of capturing and enhancing the beauty of our work once the daylight fades. After all, our clients live with their watershapes day and night, and I've found that I can greatly increase their appreciation for my work simply by paying attention to this one big detail as part of the design process.

One of my favorite lighting touches is the recessed-lighting detail shown here — one I've installed with a variety of settings in California and New Jersey. It's relatively simple and yields beautiful, subtle and stirring results.

Backing up a bit, one of my first experiments with recessed lights was back in 1988, when I set up several spas with lighting recessed beneath the benches. It worked, and it was an approach that's kept evolving as I've kept my eyes open and explored the world of design to see what others have been doing to address the lighting challenge. Basically, the message that kept getting reinforced is that light is good, but exposed bulbs are a problem — hence the value of indirect lighting.

Before long, I started noticing how much the great Mexican architect Ricardo Legoretta was accomplishing with his lighting and soon came to appreciate his special mastery of *indirect* lighting. I love his work, have visited as many of his pro-



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jects as I can and have books that cover even more, and I've always admired the particular way he sets up his lighting niches. In fact, I'm the first to admit that I owe this detail to him.

And it's become a significant debt of gratitude, because as I've tried to develop ways to tie the exterior environments I create with the architecture of the home and the surrounding area, I've found myself using his approach over and over in many different contexts. It can be used in pillars (as seen below), or it can be set up in other structures to accent walls (as seen on page 28), light pathways or highlight key features of landscapes or interior spaces.

It's a wonderfully simple detail: All you do is suspend some type of light fixture inside a flue of some kind that opens at the bottom to light a vertical surface below by way of an angled aperture.

For the project pictured in on page 32, for example, we built a small pilaster out of concrete block and cut the blocks at the open-



Even in daylight, this Legoretta-inspired lighting detail lends a special look to just about any architectural feature. In this case, the small, shadowed areas add wonderful, dramatic visual interest to a sequence of free-standing pillars.



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ing to a 60-degree angle. A single low-voltage lamp hangs inside the pilaster and can be serviced by removing the capstone. The aperture can be any size, depending on how much light you want. To be sure, there's some skill involved in creating the opening, but this detail is not about tricky construction. Rather, it's about understanding the aesthetics of lighting.

## SOFT IS THE NIGHT

We all know that lighting serves great utilitarian purposes in making outside spaces useable at night and in making them both safer and more secure. For those reasons alone, any lighting is better than none at all. But with a simple detail such as this one, you serve utility at the same time you lend beauty, warmth and even a measure of romance to the space.

Lighting that is warm and soft serves up a beauty that builds the ambiance of the space. And when you combine that soft presence with water and/or the sounds of moving water – especially in a space that draws connections between structure, landscape and watershape –



One of the things I like most about this detail is its subtlety: With staggering simplicity, the lighting niche breaks the wall's plane, harmonizes with other voids in the greater wall, comments on details of the decking – all while serving its primary function in lighting an important transition from house to pool and yard.

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you create a sense of elegance that's hard to describe.

Indirect lighting of the sort discussed above isn't the only way to achieve such harmonious effects. It's also possible, for example, to use flames in the form of torches or a fire pit to capture and convey the desirable visual qualities of warmth, softness and light's indirect in-

teraction with surfaces, objects and faces.

And it gets even better when flame is used as an indirect source—and better still if you're able to use a flame you can't see directly as a source for reflections off the water. (This last point folds back to the earlier comment that light is good; it's the bulb or flame or any point source of light that's the problem.)

With flame and other light sources, you see diffused patterns of light and defused shadow and fantastic reflections off the water because the reflection is always darker and softer than the originating light source. I believe Legoretta understood this, which is why he sought to conceal the abrasive glare of light bulbs and instead worked to deflect that light by hiding its source while still using it to illuminate surrounding surfaces.

As one who has wrestled with lighting's potential, I see errors in lighting design as colossal missed opportunities. When someone indiscriminately places high-wattage lighting out in the open where the glare of the naked lamps is almost blinding, wonderful opportunities for establishing ambiance, romance and mystery are obliterated.

With indirect lighting, by contrast, you don't see the lamp, glare is eliminated and a hot spot has been buried beyond view. Let's look at it this way: Eliminating harsh visual contours of light is not unlike the watershaping trend toward softening the edges of a pool by allowing them to vanish into infinity. In both arenas, sharp visual boundaries within a space are removed and the eye is freer to make connections on a subtle and more satisfying level.

That's why I see these little lighting niches as such a wonderful touch to use in conjunction with beautiful decking or pathway treatments.

## THE WRIGHT STUFF

Reaching back beyond Legoretta in design history, setting up lighting fixtures in this way recalls the work of Frank Lloyd Wright, particularly when it comes to integrating the structure that contains the fixture with the space.

Wright was the one who first had the idea, now omnipresent in interior design, of placing fluorescent lights behind soffits to light up ceilings or wash light across walls. The resulting light is soft and warm and draws your eye to the surface of the structure and the contours of the space.

When this effect is used in structures

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**PoolSpa Valve** (6-Port) is used for Pool and Spa combinations sharing *one common-set* of equipment, i.e., one Filter Pump, one Filter, and one Heater; Valve changes conveniently *both* the **Returns** and **Suctions** simultaneously and easily within *one(1)* 6-Port Valve. **Replaces** the usually confusing, *multiple two(2)* separate 3-Port Valves. **Prevents** accidental draining of Spa into Pool, or worse, Pool into(overflowing) Spa! **Hot Pink=====Warm Water**  
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Automatic Valve Shown

**Share-A-Heater Valve**  
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**Warm Water(Combustion)**  
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**Share-A-Heater Valve** (8-Port) is used for separate Pool and separate Spa, each having its own Filter Pump/Filter/Timer, yet, sharing just *one* Heater. Both filtration systems can operate simultaneously; while one is **heating** the other is **filtering**, and vice versa. **Eliminates** the very expensive requirement of *two(2)* separate Heaters; **Or**, of *three(3)* 3-Port Valves(or worse, multiple gate or ball Valves) and the awful, necessary manifolds of pipes, fittings, and check valves.

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Two(2) separate bodies of water each with its own Heater; Either Heater can be **added** to the **other** for additional **"booster"** rapid heating using the versatile Share-A-Heater Valve.

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Combustion and Solar  
Manual Valve Shown

**Share-A-Heater Valve**  
**Pale Orange=====**  
**(Hot Pink || Pale Yellow)**  
**Warm Water(Combustion)**  
**and Warm Water(Solar)**

#### Dual Heater Systems:

Enables *two(2)* separate Filtration Systems to share *two(2)* separate Heater Systems. Both Systems can be operated simultaneously or sequentially. As shown above, for typically hot weather areas, Solar Heating of the Pool then the Spa during day...combustion heating at night for either.

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The recessed niches work in settings far removed from Legoretta-style architecture – in this case on a project at Long Beach Island, N.J., where the niche has been worked seamlessly into the tile pattern.

away from the home, as with the pilaster light seen at left, the structure now becomes part of a unified space rather than an afterthought that stands separate from the architecture of the home.

Some might say this is no more than an expensive alternative to sticking strings of Malibu lights in the ground. I would argue that what is sacrificed by adhering to the status quo of creating hot spots and glare (or, worse, trying to turn nighttime into day) is nothing less than turning away from one of the most intriguing and inviting of all visual qualities – the warmth and beauty of the night! **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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# Wings

*Just* as few sounds blend so beautifully or evoke such sensations of peace and calm as the sweet tones of birds singing along with the relaxing music of moving water, I'd also have to say that few sights in nature delight the eye more than watching migrating robins queuing up for a bath, hummingbirds darting through a mist or a bold vireo "plunge bathing" in a rippling pool.

curred to me that, by recreating these sorts of intimate moving-water experiences, I could draw birds to these settings and provide homeowners with countless opportunities to enjoy watching our winged friends, right up close.

To that end, we established Avian Aquatics in 1992 to provide custom backyard bird sanctuaries as well as a series of off-the-shelf streams, ponds, basins and

*I can now say conclusively and categorically that I have perhaps three or four times as many as u*



Photo by Kevin Karlson

For most of my life, I've been inspired to observe the beauty and freedom of birds and am among those who have spent hours in the wild hoping to catch a glimpse of a Scarlet Tanager or to hear the song of the Hermit Thrush. From the beginning, I haven't been able to help noticing that much of my very best bird watching takes place near creeks and streams, where the moving water attracts birds to bathe, drink and play.

Because it is always a joy to spot a variety of birds in one's own backyard, it oc-

misting systems designed with birds in mind. It's a specialized niche to be sure, but the simple fact is that there are tens of millions of people in the United States alone who actively watch birds.

## *Watchers, Unite*

These "birders," as they're known, fall into two basic categories: those who travel to specific locations, sometimes over great distances, to see various bird species; and those who set up feeders, plantings and birdbaths designed to draw birds to



on  
the



There's much more to a birdbath than one might think, says Bill Fintel, an expert in the art of setting up small bodies of water to attract our feathered friends. For many years, in fact, Fintel has studied the way birds act around water and has made a career of applying what he knows to creating avian watershapes that have what it takes to satisfy a winged clientele – and delight homeowners who are passionate about their backyard ornithology.

*By Bill Fintel*

their backyards. Serious birding enthusiasts, of course, do both.

My own exploration of birdbaths reaches back to 1972, when I built my first out of a concrete basin. Before long, I noticed that if I made the water move – at first in the form of a simple drip system I installed to reintroduce water lost to evaporation and splash-out – even the simplest of baths drew far greater num-

Through the years, I've also found that combinations of misters and plants work wonders when it comes to attracting small birds. This is the simplest imaginable form of "birdbath" and works by simulating a localized rain shower.

We set the misters up to wet the leaves of small trees or shrubs that can be set up in plain view. When set up alongside a basin or stream, the misted water will drip

designing overflow basins to create bodies of water that maintain the constant, shallow depth that's so important for many species of birds.

### *The Water Dance*

If you spend even a brief amount of time watching birds interact with water, you'll see a variety of complex and even surprising behaviors.

*Historically that moving water is the key to attracting birds —  
birds will be attracted by a static basin or conventional birdbath.*

bers of birds, and in far greater variety.

I can now say conclusively and categorically that moving water is the key to attracting birds – perhaps three or four times as many as will be attracted by a static basin or conventional birdbath. And beyond the avian attractiveness, water movement keeps a system clean and fresh and dodges the old problem of birdbaths becoming little more than breeding grounds for mosquitoes.

But there's more to the story than moving water in the conventional sense:

from the wet leaves into the bath, creating ripples that enhance the system's visual appeal to people as well as its drawing power for birds.

The nuance of using mist to attract birds is just one of the many details I've observed and worked with through the years. In fact, I've always approached birdbath design with the sort of technical drive that defined my former work as a chemical engineer. That background, including an informed understanding of fluid dynamics and water chemistry, helped me in such tasks as

As is true of other animals, birds need to drink water and use it to cool off, sometimes sitting half-immersed for ten minutes at a time or more on a hot summer day. But what most non-birders are surprised by is the fact that birds are remarkably active creatures and thus appear playful as they bathe together in a stream or small cascade.

Hummingbirds, for example, love flying through fine mist, and small birds of all sorts love to "leaf bathe" by rubbing up

A



**BIRDS DISPLAY** a number of interesting behaviors in and around water that really can't be seen in any other setting. If the water's the right depth, for example, some will settle in for a good, cooling soak on a warm summer's day (A). Many others will bathe with abandon, flipping water into the air to wash off their plumage (B and C).

B





against foliage wetted by a mister – a behavior that will often precede a visit to the birdbath (or what we call a “bird creek”). Birds’ bathing is in fact an essential part of maintaining healthy plumage. Often, you can observe birds after a bath, preening to realign their feathers.

Things can get pretty athletic in well-designed settings. Species such as vireos, for example, love to “plunge bathe,” a maneuver in which they fly down and break the water’s surface like a high diver and then quickly fly away, never touching the bottom.

Bathing is also a social activity among some species, particularly Goldfinches and Cedar Waxwings: Often one bird will bathe, then two more, then four, then eight will gather in the water. Robins, curiously, are territorial bathers and will often queue up to bathe, with as many as 20 waiting in line for a turn.

Avian watershapes also have the delightful ability to offer easy viewing of hard-to-see species, such as tree-top-

dwelling warblers, tanagers and vireos. Many birders tell me what a relief it is not to have to look straight up, for instance, to spot the elusive Blackpoll warbler.

While most any birdbath with moving water will work to some extent, we’ve found that more elaborate water systems attract a far greater number and variety of birds than do simple basins. As we’ve continued with our experimentation and observation, we’ve also found ways to maximize the attractiveness of our designs, both custom and kit form.

### *Creek-Side Movement*

Beyond having some form of water movement, water depth tops the list of key design concerns. The ideal situation is a system with variable depths that include shallow areas of perhaps a half-inch depth for small species, with areas up to three inches deep for larger birds.

We also work with a range of flow rates through the systems, including parts with rapid flows a bit removed from areas with



### *Cat Nips*

Where there are birds, you will invariably find animals that feed on birds.

In the case of most backyard environments, the most common predator is the omnipresent cat. There’s no way to completely avoid problems with cats hunting the birds you and your clients are hoping to attract, but you can make it more difficult for predators by denying them good hiding places near the water.

We recommend avoiding plantings in which cats can easily hide. (They typically won’t go to the extreme of hiding with a misting system, so the creek-side shrubs mentioned in the accompanying feature can generally be used.) And if the problem is extreme, we also provide our clients with a green mesh fencing material that keeps determined felines at bay.

—B.F.







more tranquil waters. We've always been surprised to observe that even small birds will bathe in spots with what might appear to be an overwhelming flow rate – and that some larger birds will shy away from the fastest flows.

The rates we establish depend, of course, on the size of the system. Unlike ponds, where the recommended turnover rate is once every three to four hours, in our shallow bird creeks, the water is turned over as frequently as ten times each hour. This creates excellent oxygenation and enhanced water quality.

The cascades we build range from only a few inches to a foot or two in height. We've observed that larger waterfalls can discourage bird bathing, but again, we've often been surprised by how well even small birds fare in vigorous water. With respect to flow, we set up waterfalls with a minimum of 50 gallons per hour per inch of waterfall width; for more dramatic falls, we recommend flows in the range of 100 to 150 gallons per hour per inch. Either way, we focus on creating pleasant sounds.

Our systems tend to be quite simple hydraulically. We use energy-efficient, submersible pumps and locate them at the lowest spot in the system where they're set up for easy servicing. They pump water through flexible tubing back to the headwaters. We also usually set up drip systems to compensate for water that's lost to evaporation, splashed out or carried off on the plumage of bathing birds.

For larger systems, we set up biological filters – usual-

**ATTRACTING BIRDS** is largely a matter of knowing what they like, whether it's a rocky island in a stream (D), a steady trickle of water droplets from plastic tubing (E), a screen of mist through which they can fly and get a reasonable soaking (F) or a misting nozzle that both sprays them and soaks the leaves for their drinking and bathing pleasure (G).





ly a gravel pit planted with shallow-water plants as a filtering bed. In these cases, we place the pump beneath the gravel bed to draw water through the plants' root systems, which absorb nutrients and organic material. We protect the pump with a perforated mesh cover surmounted by gravel.

Finally, footing is critical to birds' ability to interact with the water. Pretty as they can be, for example, we've found that medium-sized pebbles (one- or two-inch diameters) are a problem because they create crevices that can trap birds' feet. But natural rock – or a surface that is close in texture to natural rock – is optimal, so we provide broad, flat surfaces of materials such as pea gravel at the water's edge to ensure good footing. We also use larger rocks for edge treatments.

### *Integrated Interests*

Many bird species are gregarious by nature, and we've found that yards with mul-

tipple watershapes designed with birds in mind will draw the largest numbers. Combining misters with foliage overhanging a creek, for example, or placing several small drip basins near a feeder (but not so close that seed hulls will fall in the water) will both beautify a space and make it extremely welcoming to avian visitors.

And it doesn't need to be all about birds. Large ponds and streams, for example, can be set up with just one or two areas dedicated to luring birds. And smaller spaces can be decorated with small, soothing watershapes that double as birdbaths.

However you shape it, it's time to consider that the ability to attract birds is another of the many qualities of the basic materials with which all watershapers work – and another way for us all to delight our clients and enhance their enjoyment of their backyards.

And if some flying friends enjoy it, too, well, who's complaining?



## *National Birding*

As mentioned in the main text, birding is enjoyed by millions of people in the United States, coast to coast. Certainly the mix of species you'll encounter will vary by region, and birdbaths will draw differing combinations of species depending upon geographic location and time of year.

There are some areas of the country where the effect of installing a birdbath is particularly dramatic – that is, the dry areas. Throughout much of the Southwest, for example, birdbaths draw large numbers of birds because there's less open water available in the natural landscape.


That said, it's also true that birdbaths located in areas of far greater lushness, even New England, can be extremely successful bird magnets as well.

– B.F.



**THIS WATERSHAPE** may resemble countless other streams and small ponds in basic appearance and construction, but everything about it, from its carefully established depths to the flow rates encountered in various parts of the system, is all uniquely and painstakingly calculated to attract birds to its waters and banks.





There's no room for guesswork when it comes to structural engineering, says Ron Lacher of Pool Engineering, Inc., and that's especially true for concrete structures designed to contain water. Here, he opens a series on structural fundamentals related to watershapes by defining the need for precise structural planning and careful attention to workmanship – the keys, he says, to achieving a project's aesthetic and functional goals.

# GROUND WORK



Despite the apparent intricacy of any good set of engineering drawings and contrary to what many people think, structural plans for concrete watershapes are pretty cut and dried.

At the most basic level, the art and science of structural engineering deals with predictable forces placed upon structures and with the construction techniques and materials required to counteract those forces. The basic mathematic calculations are straightforward stuff, and everything runs in accordance with building codes that define permitted stresses in the materials and the methodology of the calculations.

Working together, it's the goal of engineers, contractors and inspectors to devise structural details that accommodate the dynamic relationships between the structure and the ground and to have all that hard work be completely forgotten once the project is finished. In the world of structural engineering, in other words, you might say that success is measured by enduring obscurity.

Unfortunately, however, that sort of obscurity is not always achieved. I've performed hundreds of investigations into causes of a variety of structural failures in which engineering and construction are anything but forgotten because the concrete structure that was supposed to be permanent has instead failed in some way. In the text to follow, let's take a look at how and why this happens by way of defining a need for greater awareness of what good structural engineering is all about.

## ENGINEERING'S ROLE

Plainly stated, structural engineers who participate in watershaping projects are there to prevent system failures.

We do so by creating plans that use mathematical principles to determine physical configurations of construction materials and define a range of specific workmanship issues that come into play. How well contractors and subcontractors follow those recommendations will de-

termine whether the watershape's structure will need to be reconsidered under negative circumstances – or can be forgotten completely as homeowners and their guests are left to enjoy the water.

Through the years, I've seen just about every common failure you can imagine – and a bunch of uncommon ones, too. I've also heard every line in the book from contractors who are trying to cover their tails, including the all-too-popular personal endorsement, "I'm telling you I could park my truck on this thing. I'm sure it's just fine."

Let me state for the record that a structure's ability to support an S10 pickup has nothing to do with how well it will bear up under the stresses imposed by ground and water through the years. Let me state further that any contractor without qualifications who decides to act as his or her own structural engineer has a fool for a client.

Structural engineering is not something you can "eyeball" and reasonably hope for success. Instead, it requires an understanding of how steel reinforcement and concrete work individually and of how they work together. It requires an ability to read plans and have detailed knowledge of workmanship standards. And it calls for a good, conceptual grasp of the basic forces working against inground structures and how those forces are counteracted using steel reinforcement and concrete.

In this context, we all need to understand why these two materials, among all available construction materials, are so commonly paired in man-made structures. Here's the key: Concrete is very good at withstanding compression, but it's far weaker in resisting tension and pulling. By contrast, steel reinforcement is strong in pulling and tension, but is much weaker under compression because it tends to buckle as a result of its thin profile.

When you *combine* these two materials, you have a structure that can withstand stress from both compression *and* tension (meaning it won't bend under compression or pull apart under tension). This

**STRUCTURAL**  
engineering is  
not something  
you can 'eyeball'  
and reasonably  
hope for  
**SUCCESS.**

## THE watershape's structure ultimately must withstand *all* of the pressure placed **UPON IT.**

makes steel/concrete combinations ideally suited to a huge variety of applications.

Among those applications, a properly designed swimming pool will be able to withstand prevailing soil conditions (and other forces I'll introduce below) while it's *empty*. This means, among other things, that the counterbalancing force of the weight of the water on the inside of the pool is *not* taken into account in the structural design.

This engineering parameter is what makes it possible for concrete pools to stand empty where fiberglass or vinyl-liner pools often, if they must be drained, need to be braced to prevent the walls from collapsing—a key advantage for concrete vessels given that all pools need to be emptied from time to time.

### FORCES OF NATURE

What are these forces that must be withstood? I personally believe that it's impossible to build swimming pools effectively and reliably unless you know the

answers to that question and have a working understanding of the forces that can damage or destroy an inground structure, including soil pressure, adjacent structure surcharges, subsurface water pressure, unsuitable soil and earthquakes.

► **Soil pressure:** Because vertical pool walls must *always* withstand the weight or pressure of the surrounding soil, it's fair to say that soil is the single greatest determinant of the structure.

When considering soil, the most critical factor is its expansiveness, a function measured in "equivalent fluid pressure," or EFP. As commonly used, EFP relates to the pressure asserted by water the deeper you descend into it and is simply the weight of the water above as measured at 62.4 pounds per cubic foot (pcf). In other words, if you're down at eight feet under water, the water's weight above you will be in excess of 300 pounds per square foot (psf).

A long time ago, soils engineers determined that pressure against retaining



**ONCE THIS POOL** had been emptied of water as part of a renovation, the water in the surrounding soil caused the shell to float up and literally 'pop' out of the ground—testimony to the amazing subsurface pressures that sometimes impose themselves on concrete shells.





**THE BUILDER'S** lack of awareness of the unsuitability of this soil resulted in a classic case of differential settlement – in this instance, one that had a devastating effect on the decking at one end of the pool.

walls and other structures located in the ground could be measured using this familiar fluid pressure as a model. That may be confusing to some people because soil is not a fluid for the most part, but it all works in basically the same way.

If you look at non-expansive soil, for example, it might exert 30 pcf by comparison to water's 62.4 pounds. If you go down that same eight feet and stack up the soil, you would experience the pressure at 240 psf.

If you consider a pool wall, the EFP at the *top* would be 30 pcf, which will assert 30 psf against the surface area of the outer wall. Go down a foot, and the pressure in typical non-expansive soil will increase to 60 pounds – increasing by increments of 30 pounds for each foot you descend along the surface of the pool wall. When you get to the bottom of an eight-and-a-half foot wall, that structure, at the bottom, will have to be able to withstand an EFP of 270 psf.

The pressure climbs dramatically in expansive soil, where a typical EFP rating

would hit 45 pcf. For *highly* expansive soil, the EFP might climb as high as 125 pcf. This is basic stuff, but already we can see that highly expansive soil could place upwards of *four times* the pressure on a pool than would be experienced with a non-expansive soil.

That difference in force must be accommodated, typically by increasing both the thickness of the concrete shell and the size and frequency of the steel reinforcement used within it.

► **Architectural surcharges:** Counterbalancing the surcharges imposed by architectural structures set up near a watershape is calculated differently from EFP, but the engineering work is done with the exact same goal in mind of accommodating whatever downward or lateral pressure is being applied to the shell.

The watershape's structure ultimately must withstand *all* of the pressure placed upon it, in other words, so in addition to considering soil you must also factor in the weight of any adjacent structure that

exerts pressure on the shell, such as a house, a retaining wall, rock waterfalls, grottos, waterline rockwork, slides, wood-deck foundations or any number of other common structures. In these cases, the engineering computations become far more complex – and so do the construction details in some cases.

► **Water pressure:** Another key force that comes into play in developing engineering plans for a watershape is the force exerted by water – an issue that must be taken into account in two separate ways.

First, there is the issue of the water contained within the structure itself – which is an issue in the case of a free-standing pool wall on a slope, for example. In such a case, there's no soil pressing from the outside of the wall; instead, it's the weight and pressure of the water within the vessel that must be calculated and accommodated.

Second, there's sometimes pressure from ground water outside the shell. It's well known that this pressure – widely re-

ferred to as hydrostatic pressure – can lead to some of the most spectacular structural failures we see in the watershaping business. This happens when a pool shell is located in an environment where it is surrounded by ground water and the pool is thoughtlessly emptied for maintenance or remodeling of some kind.

In such cases, it sometimes happens that water pressure causes the entire shell to float and literally pop out of the ground – an amazing and often devastating phenomenon that can easily be avoided with the installation of a simple static-pressure-relief valve.

Most of the time, structural failures resulting from water pressure are caused by water moving through the soil down a slope that is effectively “retained” by the pool structure. Again, understanding the situation below grade and designing the vessel accordingly is the *only* way to avoid trouble.

► **Soils issues:** A far more common cause of structural failure in swimming

pools is the presence of unsuitable soil beneath the structure – another simple concept, but one that many people do not seem to comprehend fully and also the single most common cause of structural failure I’ve seen.

When the soil supporting the shell of a watershape is not uniform – a process that leads to what is best known as *differential settlement*, you have a situation where one portion of the structure is properly supported while another is not. This leads the structure to act as a hinge, which is why you see so many significant vertical cracks in pools that haven’t been engineered to suit the surrounding soil conditions.

Anticipating these problems is in the realm of soils engineers. When armed with their conclusions in the form of a soils report, a structural engineer can design a combination of concrete and steel that will stand the test of time.

Is a soils report necessary for every project? While it’s true that an experienced

eye can sometimes tell what’s going on simply by looking at the soil once the hole has been dug, there are many problems that aren’t so easily apparent, and I would advise against trying to make those determinations on your own.

In the real world, if you have any sort of reason at all to believe that you are dealing with unsuitable soils, it is critical to obtain a soils report and even more critical to have an appropriate structural plan. Without those necessities, the structure is very likely to fail somewhere down the line.

We engineers are so keenly aware of this need that most of us add notes to our standard details stating that the plan is only applicable in uniform and suitable soil conditions.

► **Seismic events:** Fortunately, this isn’t an issue all of us must consider, but in areas through most of California, for example, there is a definite concern about the effects of seismic activity – that is, earthquakes – on the structures we design and build.

I won’t dig deeply into this topic here. Suffice it to say, if you live in a region that contains earthquake faults, you can be certain that, at some point, the structures you build will be subjected to some level of seismic activity. It’s not a matter of *if*, but a matter of *when*.

## SHELL SPECIFIC

All of the information I’ve offered in this quick overview of engineering issues has been directed to defining the role of engineers and engineering in watershape design and installation – and to demonstrate, I hope, the value of the engineer’s role in ensuring the long-term integrity of a watershape’s concrete-and-steel structure.

A lot of what’s been covered so far actually applies to all structures set on or in the ground, but there are some issues we’ve already covered that are specific to pools and spas and other watershapes – and we’ll delve deeply into those specifics in articles to come.

One example of such a watershape-specific issue has to do with the common phenomenon of cracking at the skimmer. It’s not difficult to understand why this happens, because the steel reinforcement

## WORKMANSHIP

As this series of articles unfolds, I’ll be focusing on several specific construction details and common mistakes. Here we see one of the most common problems of all: lapped steel.

In most construction codes, it’s clearly spelled out that you must have 2-1/2 inches of space between parallel bars. When you lap bars together (as shown in the photo), you create a situation in which the gunite cannot fill in behind the bars, creating “shadows” and empty pockets that compromise the structure.

–R.L.





## THE EXPANSION INDEX

When expansive soils get wet, they want to expand.

This happens because of the particle size of the soil itself and the way it changes as water is absorbed. Clay soils are the most expansive because they start with the smallest particle size. Silts have bigger particles and are less expansive, while sandy soils have even larger particles and are often classified as non-expansive.

Soils with smaller particles are more expansive because of capillary action that draws water between the soil particles and causes the soil to expand like a dried-out sponge. A measuring system called the Expansion Index measures how much a given quantity of soil will expand when it becomes wet. The Expansion Index is then converted to an "equivalent fluid pressure" that is used as the soil pressure force in designing the wall of the watershape.

Each time you see a buckled or uplifted deck, it's more than likely you're looking at a structure that was not designed with the Expansion Index in mind. By understanding how much soil will expand, we are able to determine how much counterpressure is needed to withstand it. In the case of the deck on expansive soil, it often takes thousands of pounds to do so.

This is also true for vertical structures such as pool walls, which are, in basic engineering terms, nothing more than cantilevered retaining walls.

—R.L.

Expansion Index	Equivalent Fluid Pressure
21-30	33
31-40	35
41-60	40
61-80	43
81-90	45
91-100	50
101-110	53
111-120	55
121-130	58
131-140	60
141-165	62.4
166+	80

**USED ALONGSIDE** information on equivalent fluid pressures, the Expansion Index is an invaluable tool in properly engineering concrete structures to withstand the forces that work against them. (Courtesy Duco Soil Engineering, Walnut, Calif.)

around many skimmers is installed in such a way that it creates a weak spot in the bond beam that invites the possibility of cracking. In fact, any watershape subject to differential settlement will likely crack first at the skimmer because that is the bond beam's weakest spot.

In future articles, we'll look at this and other watershape-specific issues, pull them apart, look at causes and explore ways of anticipating and preventing problems.

By way of concluding this first article, let me say that failures such as cracking at the skimmer are often, but not *always*, the result of some sort of code violation. I know that many contractors do not like building inspectors and resent having to follow construction codes, but what's forgotten in the midst of the animosity is that codes are there as much to protect the builder as they are to help homeowners.

To achieve true success with water-shaping and exploit all of their wonderful aesthetic possibilities, designers, engineers and builders must work together in building concrete and steel structures that take those protections into account and prepare them to stand the test of time—hidden away in perfect obscurity.



**IT'S NOT ALWAYS** the case, but very often the kind of cracking that appears around skimmers has as much to do with a failure to observe basic building codes as it does with the hinge effect and differential settlement. The skimmer is the shell's weakest point and must be engineered and installed properly.

A photograph of a swimming pool with a person's hand resting on a lane line. The lane line is a dark, corrugated plastic divider. The water is a light blue color. The background shows the pool's edge and a tiled floor.

# Helping

# Hands

**By Suzanne & Ron Dirsmith**



As architects and environmental artists, Suzanne and Ron Dirsmith have always taken pride in creating spaces that nurture the spirit, mind and body. In one recent project, however, they went several steps beyond that in setting up a watershape for a special child who uses water exercise to gain strength, flexibility and freedom. Here's a look at how they accommodated his needs – and learned a great deal about the healing power of water in the process.

**T**he notion that water can be used to treat physical problems and conditions is not new. In fact, when you study the history of watershaping and aquatic design, one of the first things you learn is that the ancient Romans might actually have had a better grip on the healing and nurturing powers of water than we ever will.

In our own work in designing and installing environments that nurture the spirit and invigorate the body, we pursue that Roman heritage as best we can – and *always* keep water in mind as a key component.

The project described in this article stands as one of our most dramatic explorations of the curative power of water to date. The pool, spa and surrounding facility were conceived to facilitate physical therapy for a young boy who had been partially paralyzed since birth. Our work with him, his therapists and his family ultimately taught us a great deal about the human body and the way it responds to exercise and movement in water.

More important still, this young man would truly capture our hearts with his winning smile, acute mind and unflagging spirit.

### Special Delivery

In working with the boy and his family, we became intimately familiar with his physical condition. We were never told (and didn't feel comfortable asking) about the cause. But it didn't matter much anyway, because by the time we came to know him and his family, he was eight years old and everyone's attention was trained on ways to help him in the here and now – and he was indeed making progress.

By the time we met him, in fact, he was somewhat able to maneuver on his own with a walker. This achievement was the result of long years in which therapists had been retraining and stimulating his neuromuscular system through intensive exercise of the muscles in warm water. The warmth of the water, hydrotherapy massage and muscle stimulation were intended to encourage the transfer of electrical signals in his neural pathways, with the hope that this would open up those pathways to a more normal routing and use of his body's "control systems."

At first, we thought this was only a hope or dream, but as we worked with the therapists, studied the young boy's capabilities and observed the results, we began to understand the theories – and to believe wholeheartedly that his dream of gaining strength and mobility could one day become reality.

Our assignment and challenge was to design and construct a building that would house a pool and hydrotherapy environment along with special interior facilities that would accommodate the boy's unique capabilities, requirements and potentials. It was also critical for the environment to be non-institutional, warm and nurturing – and to allow him to be as independent as possible.

From start to finish, details were to be dictated by careful observation of his physical actions and anticipation of his future development and needs. With a master's degree in education and a par-

ticular focus on “special needs” children, Suzanne took the lead on this research from the outset. We also met frequently with his therapists and the boy either at his home or in a rented pool facility where he had originally started with the early stages of hydrotherapy.

### Watching Carefully

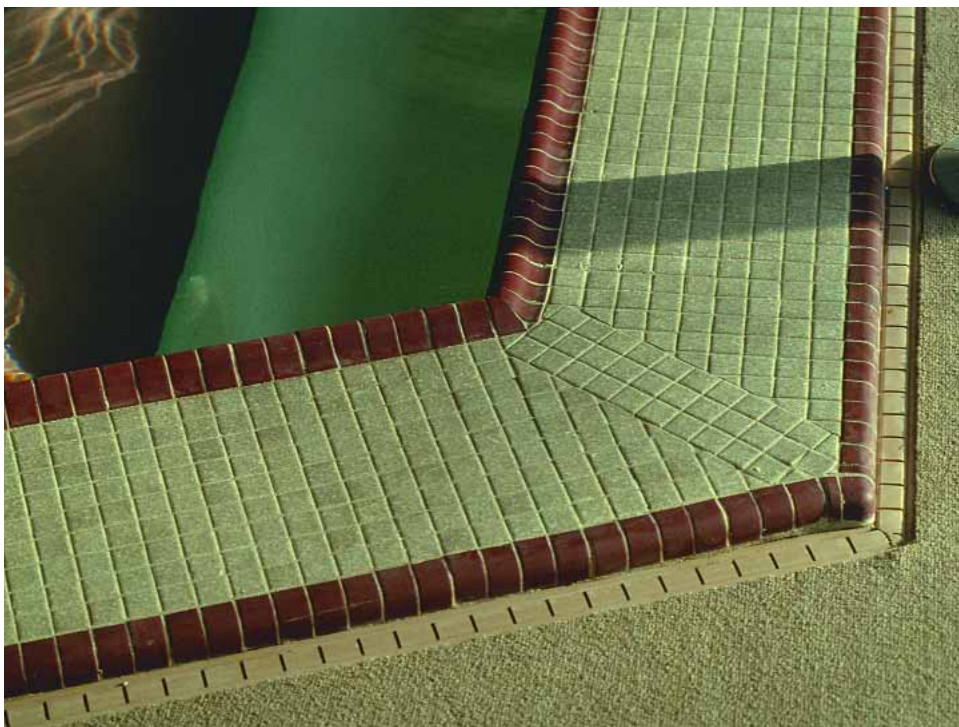
For a time, we simply watched as the therapists worked with the child and helped him perform mostly simple activities in and around the pool and deck. We took copious notes, recording the way he maneuvered in and out of the water, how far he could reach, what his limits were with respect to extending his arms and legs, and how he reacted to things that were happening to him in the water.

We posed many questions to his therapists, exploring a range of “what if” scenarios: What if, for example, he could grab something like the pool coping with his small hands, arms stretched out, and then push himself away from or pull himself toward the wall? What if all devices we made available were of push/pull rather than twist/turn configuration? And what if he accidentally fell into the pool? Would his coordination, strength and capabilities allow him to get out by himself?

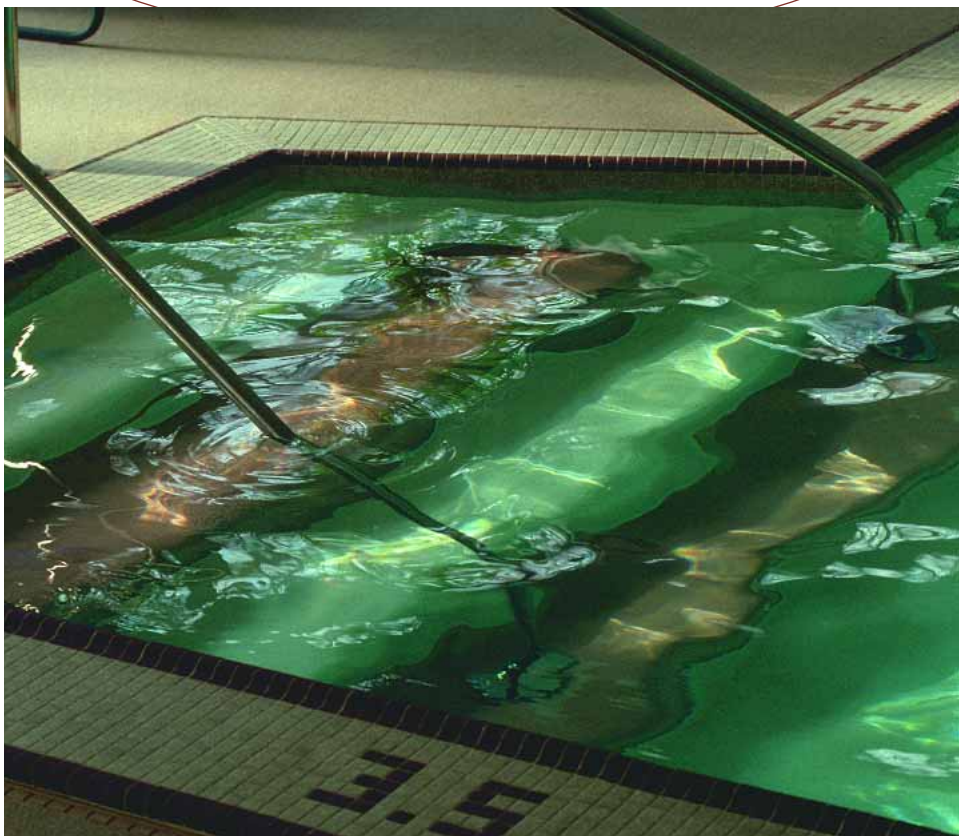
The answers to these and other questions allowed all of us, together as a team, to begin exploring a range of ideas, notions and possibilities that might help this boy. As we moved forward, we all recognized that this was truly an experiment that would unfold only with his participation as he developed and tried things out for himself.

The therapists’ role was crucial in guiding our design efforts. They told us, for instance, that his body responded best to limited-duration water therapy at 92 to 93 degrees. Any cooler and his muscles would not respond very well; any warmer and he tended to fatigue easily and go limp. And although the dehumidification and HVAC systems were designed to achieve a year-round temperature of 75 degrees and 50% relative humidity when desired, the therapists tended to raise the air temperature to about 89 degrees when the boy was working with them in the pool area.

In other words, his basic needs dictated that the pool building and the hydrotherapy environment had to be designed and engineered with rigorous control of water, air, temperature and humidity. That last factor was particularly critical here in the Midwest, where dehumidification and control of condensation typically pre-



Many of the pool's details were dictated by the need to provide the child with things to grab, including coping specially contoured and textured to suit his small fingers and set up with a back edge that lets him pull himself out of the water at any point around the pool's perimeter. Although the vessel has been set up with all the appropriate institutional fixtures, our design work put a premium on softening the edges and making the room seem more like a family den than a therapy suite.





## Wash and Dry

For the little boy of the accompanying story, taking a shower and drying himself – all by himself – proved to be a mind-boggling challenge, both for him to perform and for us to design.

Try to imagine how you could manage to turn on the shower water with such limited physical capabilities and test the temperature while avoiding the shock all of us have experienced of the water either being too hot or too cold. How could one who is so immobile jump back in order to adjust the temperature?

To solve this problem, we worked with the plumber to install a special “toe tester” – a little water spout set on the floor to the left of the shower heads that enables the boy to adjust the temperature until it feels just right. Only then does he need to wriggle into the stream or move to the seat we’d designed for him.

This was a double-check system, of course: The water controller was thermostatically set to an automatic temperature by his therapists, and it was all supposed to be “fail-safe.” But we took no chances and were pleased that the old-time, master-craftsperson plumber was a genius at finding odd-and-sundry fittings in his black bag that could be counted on.

Once the showering was done, the boy then faced a need to dry himself off. Towels were no help, because the mobility of his arms was too limited in all the necessary directions. What to do?

In this case, the owner of the HVAC contracting firm was the man of the hour. We had envisioned an upholstered corner seat with recessed, high-velocity, aircraft-type air diffusers placed to nearly totally engulf the boy’s body in a stream of warm, drying air. The challenge was to avoid sudden blasts of too hot or too cold air that might shock or startle the boy.

The key to the system is the large plenum/mixing box recessed above the ceiling. Inside, a large air volume is heated to the proper temperature, at which point the plenum opens very slowly with a motorized damper. This gradually purges the cold, still air from the ductwork and allows only warm air to flow through the duct system; the fan moves to full speed when the pre-set air temperature has been reached.

Again, the therapists called the shots, finding the optimum temperature and flow rate to dry him comfortably and completely. And the system was controlled by a single rocker switch that the boy himself could manipulate with ease.

– S. & R.D.



sent unique sets of challenges.

As the period of observation went forward, we found that the child could float horizontally on his stomach in the water and could almost extend his arms straight out – but could not lift or raise them above his head. This extra range of motion was a critical therapeutic issue and among the skills his therapists were attempting to teach him.

## A Place To Be

To aid in this range-of-motion therapy, we designed a special nosing and coping detail that would give his small fingers something they could grip tightly as he floated in the water.

It's a simple detail, but by enabling him to push himself away and then pull himself back, the nosing sets the stage for crucial progress in his therapy: As the therapists explained it, using the muscles in repeated forward/reverse motions would encourage the passage of electrical impulses from the brain to the central nervous system and, ultimately, to the muscles that were being instructed to perform repetitive actions or functions.

In the boy's case, the therapists could use the nosing to begin a learning/re-training process in which they'd place his fingers on the coping and then push or pull him away, repetitively and mechanically. Their hope was that, by activating and physically manipulating the muscles, somehow this might activate or stimulate electrical signals and "open up" the boy's own internal circuitry.

Early observation in the rented facility led everyone to believe that this approach was working. In fact, by the time we started construction on the pool and the surrounding structure, hydrotherapy was fast becoming the method of best resort when it came to helping him develop and expand his capabilities.

The coping detail was just one of many special features we set up for the pool. To help make him feel as though he was in on the fun when his family and friends were in the water, for instance, we created a six-inch safety ledge about 36 inches below the waterline around the full perimeter of the pool so that he could glide sideways around the pool edge while hanging onto the coping.



Integrating indoors with outdoors – and thereby enhancing the boy's sense of freedom and involvement with more than a universe confined by four walls – was a key part of the design program.

This lets him participate in games or simply relax with family and friends from anywhere along the pool's edge – a small detail, but something that gives him extraordinary personal pleasure and satisfaction as well as a warm, secure sense of self-sufficiency. In addition, built-in grab troughs allow the boy to pull himself up and out of the pool anywhere around its perimeter.

This same attention to detail extended beyond the pool to the sinks, toilets, benches and faucets – all basic, mundane features that had to be reconsidered in terms of his capabilities and usage. (For more on the shower and dryer, see the sidebar on page 49.) All controls for lights, automatic doors, dryers, showers and faucets were of a push type he could manage by himself.

## Personal Focus

From the start, the design intention was to make the pool environment a focal point where the boy's parents and other siblings could all gather for games, picnics, parties and special events. So while we concentrated on getting the details right for the boy's physical therapy, we were just as aware that pool games, kids' stuff and family parties were on the agenda as well.

There's nothing stark or institutional about the structure or the interior space. To be sure, all the necessary institutional-type fixtures are there, but we set up handrails, grab bars and balancing bars, for example, to look more like towel bars than institutional props, using a soft-beige plastic with a diameter small enough that the boy could use them easily with his small hands.

And the illusion is preserved by virtue of the fact that towels actually hang on some of the bars – a small touch, but one that adds considerable warmth to what could easily have become a clinical space.

To add these and other touches, we carefully watched as the child navigated in his walker and observed that it was quite a challenge for him to avoid tripping and falling or catching his toe or shoe on the smallest change in floor elevations. Door thresholds, moldings between carpet and tile and even flanges at floor grilles were tough to negotiate. To be sure, he was very careful and good at what he was doing, but he simply could not raise his feet up as he moved through a space. This is why we detailed all of the carpet, tile, floor grilles and trim to be *exactly* at the same level.

He had a terrific grip with his little hands and could push and pull quite well,





The wall of windows lends a measure of openness to the setting year 'round, and we worked at making the spaces on both sides of the glass as warm and inviting as possible.

but we also saw that turning or twisting anything was very difficult if not impossible. And while he could approach a doorway easily, it was hard for him to get out of the way to open a hinged or swinging door. So we set up his special space with motorized pocket doors activated by low-voltage touch plates set at his hand height on either side of the doorways.

All the light switches are of a push/pull variety that is easy for him to operate, and they're all ganged, engraved and color-coded so he can control the entire environment just as well as anyone else in his family.

### Completing the Scene

In many respects, the pool itself is ordinary – a simple, poured-in-place concrete rectangle with a cove for stairs. But that belies all of the care and consideration that went into setting up *all* the elements of this special space.

The coping/pool edge mentioned above, for example, was custom-made using one-by-one-inch ceramic tiles with a non-slip friction finish for safety and easy grabbing. The pool is also surrounded by a continuous slot drain set flush with the glue-down polyester carpet decking. An ozonator maintains and controls the

water's bacteriological characteristics – a special challenge in view of the 93-degree water temperature.

Large planter pockets were cut into the deck to lend a natural, open-air feel to the indoor space. The walls and ceilings were finished in a white, Portland cement sand finished plaster, while large, sliding-glass window walls open the entire space to the outside and to the beauty of the natural gardens beyond.

The open shower alcove is finished with the same non-slip ceramic tile as the coping and features a little seat ledge. All of the special fittings, counters, ledges, hampers and seats in the changing room, body-drying alcove and toilet areas were fabricated from Corian with soft, large-radius corners and edges.

Low-voltage incandescent lighting was recessed all around the pool environment, and all of the fixtures run with slide dimmers that the boy, his family and friends can easily manipulate to set a variety of moods.

The Dry-o-tron dehumidification/ heating/supplementary air conditioning system was designed to maintain indoor relative humidity at approximately 50% while allowing for temperatures ranging from about 75 degrees for parties and other gatherings

to the 89 degrees the therapists wanted for the boy's workouts. As was mentioned above, these control tasks, both warm and cool, are complicated by the fact that the water is maintained at an even 93 degrees.

The home itself is a simple, two-story American Colonial with red brick, white trim and a gable roof – all quite ordinary, but with some nice woodwork in the family living and dining rooms and generally of sound design and construction. Before we attached the pool building to the rear of the house, the landscape consisted of a large, flat lawn.

We focused some of our attention on making the exterior space more attractive, adding a series of intimate little gardens, terraces and walkways set among large, densely planted evergreen trees we used to establish a sense of privacy. The trees were set in long, undulating beds of evergreen ground covers, with colorful seasonal flowers along the borders.

To make it seem as though the new garden spaces and the pool structure had always been there, we planted groups of mature flowering shrubs and placed specimen plants of climbing evergreen vines on the new brick walls.

### A Fine Finish

There's a bittersweetness to this story because, obviously, there may be no "cure" for the boy's condition, and any progress that may come through treatment will always be incremental and is often very subtle. But once his pool was in and he'd had the opportunity to experiment with his exercise regimen for some time, one and all were happy to see that he had already developed enough strength to pull himself out of the water and onto the pool deck all by himself. He had never been able to do that before.

It has been some years since this project was completed, and we do not know if this facility was ever made available to others with similar challenges. But we do know that much of the research and the knowledge we and the therapists gathered by experimenting with a variety of physical therapies has been shared with other professionals and institutions that deal with patients with these challenges.

In our own way, we are proud to have been able to help.



Widely regarded as one of the country's most prestigious golf courses, The Quarry Golf Club at La Quinta, Calif., is also a significant point of pride for Ken Alperstein, managing partner at Pinnacle Design Co., a firm that specializes in creating expressive landscapes and watershapes for golf links nationwide. Here, he describes what went into the waterfalls, streams, ponds, rockwork and landscaping that lend the setting such powerful charm.

By Ken Alperstein

Tucked into a small cove in the mountains behind La Quinta in California's lower Coachella Valley, The Quarry Golf Club is hidden, ultra-private and basically unknown to all but members of the golfing elite and the wealthy few who play the course.

First conceived by entrepreneur Bill Morrow and designed by renowned golf course architect Tom Fazio, the course is a prime example of just how beautiful golf courses can be—and of how critical a role landscaping and watershapes can play in defining their character and aesthetics.

Our challenge was to embroider the course's 18 PGA-sanctioned, championship-caliber holes with streams and planted areas worthy of the setting. At the same time, we were charged with designing the streams and ponds in such a way that they could handle runoff from a hundred-year storm while protecting the club from devastation.

It was a tall order, and one that proved both exciting and rewarding through each step of the process.

Photo by Tom Brewster, Palm Springs, Calif.

# DIGGING

## THE

## QUARRY







## GRAVEL TO GOLD

Long before we at Pinnacle Design Co. became involved with the project, Morrow saw the site's potential for golfers after visiting a course called Black Diamond in Lecanto, Fla. — a Fazio project that had been built on an abandoned stone quarry. As the story goes, Morrow was inspired by the irony of installing a prestigious golf course on what amounted to a wasteland, and he soon began a search for similarly discarded locations.

Morrow ran down his quarry in an abandoned sand-and-gravel pit that had been mined by Riverside County for more than 70 years to pave roads and highways.

## FINE LINES

The location and size of the water on championship golf courses is about more than aesthetics or irrigation: Indeed, what makes streams and ponds on golf courses different from those in other settings is that water is part of the game itself.

Because the water must serve as a hazard for players, there must be an extraordinary level of interaction and communication between golf course architects and landscape architects. That was certainly the case on this project.

The overall design of the water systems is all based on lines of sight from the tees, fairways and greens and are set up in ways that influence the playability of the course. For example, streams on golf courses are typically located on the left sides of fairways so that right-handed golfers are less likely to hit their shots into the water. (Statistically, right-handed golfers at all skill levels will slice their shots to the right as opposed to hooking them to the left.)

By contrast, the size, location and shape of still bodies of water such as the ponds and lakes typically seen near greens are carefully considered to provide enough of a hazard to make things interesting for top-flight golfers, but not to be so intrusive as to make the course unreasonably difficult for average players.

—K.A.

The ugly pit had been idle for years and was of interest to nobody but Morrow. After purchasing the land at a public auction (in which he was the only bidder), Morrow contacted Fazio, who immediately confirmed Morrow's hunch that the topography and setting would make for a spectacular golf course.

Indeed, the course takes full advantage of its underlying landforms and now sits atop, on and below an alluvial fan that rises behind the exclusive enclave of La Quinta. Seven holes are on the valley floor, at the foot of the fan; seven holes are placed on the fan itself; and four upper holes are set in a cove that extends deep into the jagged mountainside.

In all, there's a 300-foot vertical drop from the highest point to the lowest. This afforded not only some truly dramatic contours for the golf holes, but it also gave us spectacular topography to work with in setting up the "non-play" areas of the complex.

Fazio and his design associate, Andy Banfield, decided that these three distinct sections of the course should also be equally distinct ecological zones reflected in the plantings and in the movement of the water. That in mind, we ultimately transformed a lifeless quarry into a riparian garden that features almost 4,000 feet of recirculating streams, four lakes, a massive waterfall run, hundreds of California fan palms and a rich palette of native and non-native plant species.

## VIEW FROM THE TOP

Because of the site's high degree of verticality and three distinct levels, we started by considering ways of moving the water from top to bottom — both the water that would be re-circulating through the stream/pond system as well as the natural runoff that can appear, sometimes violently, in the form of the "gully washers" that hit desert areas.

Our overall strategy was to incorporate dry stream channels on the uppermost level along with functioning streambeds that would descend from on high to cross the face of the alluvial fan. Both the dry and wet systems would flow to a large drop structure and descend to the lower level, where a broad stream would feed

a series of four large lakes on the valley floor.

This meant that the streambeds would have to be designed as aesthetic features that could double as drainage channels. The lowest of the four big watershapes on the lower course would similarly serve a dual role as a beautiful pond that would also serve as a holding basin in the event of a hundred-year storm.

The cove and alluvial fan offer spectacular views of lower portions of the course in the foreground as well as the date groves of La Quinta in the distance. Development of the previously undisturbed lower portion of the course was handled with great care so as not to disrupt the natural environment. To that end, access to tees, fairway drop zones and greens was all carefully cordoned off to minimize intrusions on the natural landscape. We also used the dry streambeds and other planted areas as "re-vegetation zones," where plants salvaged during construction of the course were replanted.

As you descend from the top level to the bottom of the alluvial fan, you move with streams that originate at dual headwaters adjacent to holes 7 and 16. We handled these headwaters in two different ways: On Hole 7, water emerges from a grotto set in the side of a slope; for Hole 16, a sub-surface return manifold fills a pond that spills into the stream.

Both waterways are small at first, representing only a small portion of a flow that is increased at several additional return points farther downstream. It's a great illusion: Just as natural water gathers in volume and action as it moves to

**RAGING WATERS:** The waterfall is a system of artificial rockwork set atop a drop structure designed purely for function by the project's civil engineers. As seen on the opening spread outside the context of the golf course (page 52 and 53), it looks remarkably natural. Seen from a more inclusive angle here, with the deep greenery on the left contrasting with the high-desert foliage on the right, the naturalism of the waterway helps convey a sense that the golf course was draped over the land's original contours rather than shaped and crafted in almost every detail.









**ROLLING ALONG:** There isn't a lot of elevation change on the course's lower levels, which gave us the opportunity to let the stream meander around the contours of the golf links in ways that make everything appear more natural.



Photo by Ken Alperstein







## IT ROCKS

We took all manner of approaches to rockwork at The Quarry.

- The cobble and spoils used in the streams were all generated as a result of the screening process used to set up topsoil for the golf course.
- More than 2,200 tons of limestone and granite boulders were imported to the site, where they were interspersed among indigenous stones in the streams and planted areas.
- The artificial rockwork used on the drop structure consists mostly of pre-cast panels we made on site using impressions from nearby rock formations.

— K.A.

lower elevations, we wanted the streams in this system to increase in size as they moved to the lush areas on the course's lower levels.

The streambeds are strewn with granite boulders of varying sizes, set in the water or arranged carefully along and near the banks. The plantings on this level are mostly indigenous and of more arid sorts than those found below, lending the space the feeling of a desert oasis. The streams and lakes are planted with a variety of aquatic grasses and other plants, along with several species of fish.

## THE BIG DROP

From the start, one of the key components to the design was the 80-foot drop structure located on the face of the alluvial fan by Hole 10. The civil engineers who worked on the site designed the structure with a 50-foot weir that was capable of transmitting a five-foot wall of water to the lower elevations during a flash flood.

As originally designed by the engineers, however, the structure was a drab, concrete eyesore of the kind you'd see in any number of municipal locations with similar topography and drainage requirements. To say this structure presented a challenge to the aesthetic integrity of the course would be a *huge* understatement.

We handled the issue as best we could, incorporating the dry structure into our wet de-

Photo by Tom Brewster





Photo by Tom Brewster

**QUIET GRANDEUR:** The fact that the lakes had to assist as catchment basins to accommodate the possibility of a hundred-year storm enabled us to take advantage of their reflective surfaces, letting them beautify the grounds as they serve their vital, practical role.



Photo by Frank Domin, San Diego, Calif.





**THE WESTERN RANGE:** Placed at key points around the grounds, bronze reproductions of Remington and Fraser originals lend an air of the Wild West to the golf club, hearkening back to people and events that might have been part of the fabric of the area's life in its old mining days.



sign by using customized "rock cladding" to mimic the rock faces of the surrounding mountains and send our stream water over the weir. In this way, the structure could be used to create a dramatic set of vigorous, cascading falls in daily use while still being capable of handling a torrent under storm conditions.

The structure is further blended with the native terrain by virtue of thousands of square feet of rock formations made of gunite fiberglass-reinforced concrete (GFRC) as well as areas of colored concrete sculpted and embedded with natural rock to mimic the look of stabilized eroded-soil formations.

As built, the drop structure indeed looks spectacular and is by most accounts a signature feature of the course. But if I had one thing to do over on this project, I would've worked to break up the linear appearance of the weir: As it now stands, its knife-edge is the only element in the watershed system that appears unnatural.

In any event, the stream picks up again at the base of the drop structure and eventually transitions into a series of four large ponds dressed in a variety of lush plantings. The flow terminates near Hole 9 in the largest of the lakes, where the water passes through a huge skimmer before being pumped back to the headwaters and other returns set up strategically along the way.

The streams re-circulate at a standard rate of 4,000 gallons per minute in (mostly) 18-inch plumbing driven by four 100-horsepower pumps that run on three-phase, 480-volt power service. When water is being added to the system courtesy of several nearby wells, the flow may reach as high as 7,000 gpm.

All of the water in the system is eventually used in irrigating the golf course and is continuously replaced, so there is no need for filtration. We did, however, use bottom-mounted bubbler aerators in the ponds to improve clarity and overall water quality. All of the pumps for the streams and the irrigation systems are in one location and controlled using a single computer system.

Well water is drawn into the system at Hole 18, right near the clubhouse. During summer's blazing heat, the

Photo by Frank Domin





Photo by Frank Domin

**OUT OF BOUNDS:** Among the many objectives that made this project so captivating in a design sense was the amount of attention we were asked to give to non-play areas of the course. This helped us establish and communicate the three ecologies of the design program all around the fairways and greens and made it possible for us to let the land express its “natural” condition.



Photo by Frank Domin



Photo by Ken Alperstein



## Mining Authenticity

During construction of The Quarry, crews located an abandoned uranium mine complete with some of its original equipment.

Course founder/owner Bill Morrow decided to restore the site, using it to tell the story of early mining operations in the area. To help with this part of the project, we hired Geoffrey Garcia, a gold miner from central Oregon, who installed some additional antique mining equipment and lent a special sense of authenticity to the site.

—K.A.



course requires approximately a million gallons of water per day for irrigation, with the need dropping to as little as a quarter of that level through the winter. Because all of the streams and lakes are designed to retain runoff from a tremendous storm, we set up considerable freeboard area in the form of broad, sloped shoreline contours that aren't particularly noticeable to golfers who manage to hit their fairways.

All of the plantings are watered using drip emitters that are just wonderful for irrigating plants in an arid environment but also, as it turns out, are great at attracting wildlife – in this case, coyotes, rabbits and field mice who would routinely chew up the emitters to get at the water. For a time this seemed an unsolvable problem, but we finally decided to live with the animals and installed two small water sources and a couple of salt licks. Fortunately for the club and the animals, this strategy worked.

## Mood River

Because of the way the course is designed, the watershapes reflect different moods in different locations.

The upper streams, for example, start out peacefully at a slow, meandering pace of 1,000 gpm between several intermediate pools. The streams gradually pick up in activity level as they approach the drop structure, where we accelerate things by adding water at a rate of 2,000 gpm to generate a far more vigorous, active cascade.

At the base of the falls, things slow down once again as the

stream widens to create a sort of glistening, surface-riffle effect. There's very little vertical transition at this level, and the streams move slowly toward ponds that complete the "narrative" by taking on a serene, reflective quality.

The movement of water and the types of plantings tell their own story of how nature works in these sorts of natural settings. The indigenous, drought-tolerant plantings at the top transition through increasingly lush passages that conclude in the area with the most water. Here, we set up dense stands of California fan palms, flowering palo verdes, broad turf areas and a variety of ground covers and shrubs.

Much of the watershapes' aesthetics can be enjoyed from the clubhouse, where the lakes spread out in a foreground view and reflect the surrounding mountains and beautiful desert skies. From there, you also see the waterfall's dance over the drop structure in the distance. The streams trail back into the landscape, drawing the eye into the upper reaches of the course.

Although access is reserved to a handful of the private club's members and guests, the golf world has nevertheless taken notice since the course opened in January 1994. In 2000, *Golf Digest* placed The Quarry among the top 100 courses in the United States – and it's worth noting that the vast majority of the other courses on that list were established decades ago, with many dating to the early 20th Century.

One of the final touches on site was installation of a series of bronze replicas of famous bronzes by Frederic Remington and James Earle Fraser depicting wildlife and characters one might have seen in the Old West. The forms are elegant and whimsical and add grace notes to an exquisite setting.

These days, when I have occasion to visit the course at The Quarry Golf Club, I have a strong sense of pride and feeling of accomplishment in having taken part in creating such an inspired and inspiring landscape. Even more, however, I take delight in having helped to turn a lifeless and forgotten scar on the landscape into a captivating work of art.

## Group Effort

The project described in the accompanying text could not have been completed without the skill and dedication of the following firms:

- Winchester Development, Palm Desert, Calif. (project development)
- Fazio Golf Course Designers, Hendersonville, N.C. (golf course design)
- Cook & Solis Construction, Escondido, Calif. (waterfeature construction)
- The Larson Co., Tucson, Ariz. (artificial rockwork)
- STO Design, Santa Ana, Calif. (hydraulic engineering)

—K.A.

## PRESENTATION SOFTWARE

### Circle 125 on Reader Service Card



**GARDENSOFT** offers GardenWorks, software that lets design professionals set up a digital portfolio using images of past projects. The images can be plugged into 200-plus existing categories and are completely sortable and searchable by project, theme, style, type, features, plants, elements, materials and a range of custom categories. Up to 16 images can also be printed on a page. **GardenSoft**, Thousand Oaks, CA.

## POOL EDGES

### Circle 126 on Reader Service Card

**PACIFIC CLAY PRODUCTS** offers the Poolside Collection, a line of pavers, tiles and bullnose brick designed to bring flexibility and creativity to the design process. The pavers come in 11 earth-tone colors, the tiles in more than two dozen colors and textures and the bullnose in 11 earth tones and in two "used" finishes. The coping is available with several profile options. **Pacific Clay Products**, Lake Elsinore, CA.



## DECORATIVE AERATOR

### Circle 127 on Reader Service Card



**KASCO MARINE** offers the F2400/VF, a half-horsepower decorative aerator designed to control algae, organic sludge and the growth of aquatic weeds by increasing the circulation and oxygenation of thermally stratified water in ponds while stimulating the degradation of organic waste. Lightweight and easy to install and operate, the unit is available with an optional lighting system. **Kasco Marine**, Prescott, WI.

## PRE-FABRICATED STREAMS AND CASCADES

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**REPLICATIONS UNLIMITED** offers pre-fabricated rock streams, cascades and waterfalls. Molded from real rock formations using technology that's been applied for years by theme and amusement parks, the rock systems are made for new work or retrofitting to existing watershapes with lightweight, state-of-the-art polymers and high-quality coloring agents for long-term performance. **Replications Unlimited**, St. Louis, MO.



Continued on page 64

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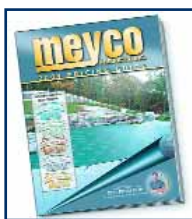
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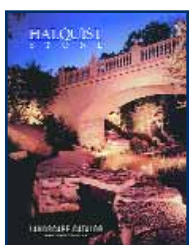
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**MEYCO PRODUCTS** has expanded its line of safety pool covers to meet the needs of specific sorts of pool designs. The line features five series – Traditional, Classic Quick Ship, Classic, Estate, and Grand Estate – to meet the needs of projects of all types, from the most straightforward to the most intricate, multi-level custom designs. All are fastened to the pool decking using specialized hardware. **Meyco Products**, Melville, NY.

## LANDSCAPE-STONE CATALOG

Circle 131 on Reader Service Card



**HALQUIST STONE** has published a 16-page, four-color catalog covering its full line of landscape products. The brochure covers outcropping stone, cut wallstone, steps, treads, coping, pavers, tile, flagstone, fieldstone, edging and more – and custom cuts are available. All products are available in a range of colors with a variety of textures and finishes for use in landscapes of all styles.

**Halquist Stone**, Phoenix, AZ.

## BRICK CLEANER

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**CERTOL INTERNATIONAL** offers Dyna-Clean, a liquid brick-cleaning product designed to remove excess mortar, white efflorescence and white scum as well as rust, aluminum, copper, lead pencil and other stains from decks and surfaces marred during construction or renovation work. The product is available in one- and five-gallon containers as well as 30- and 50-gallon drums. **Certol International**, Denver, CO.



## RESIDENTIAL DIVING BOARDS

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**S.R. SMITH** has introduced Flyte Deck II, an acrylic-fiberglass diving board for new or renovated residential swimming pools. The board's outside surface resists scratching, rusting and fading, and the standard half-meter stand can be used with available 6-, 8- or 10-foot boards in Radiant White, Marine Blue or any of the company's designer colors, from Strawberry Coral to Black Onyx. **S.R. Smith**, Canby, OR.




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## POOL SURROUNDS

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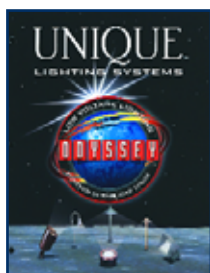
**HADDONSTONE (USA) LTD.** offers fountain-pool surrounds in combinations of kerb, vase and plinth sections to suit custom needs. Available in six sizes from half small to extra-extra large, the system also features straight sections and corners for total design flexibility. The embossed kerbs feature ovolos and

palmettes, while the conch-shaped vases serve as fountains or planters.

**Haddonstone (USA) Ltd.**, Bellmawr, NJ.

## LANDSCAPE LIGHTING

Circle 134 on Reader Service Card



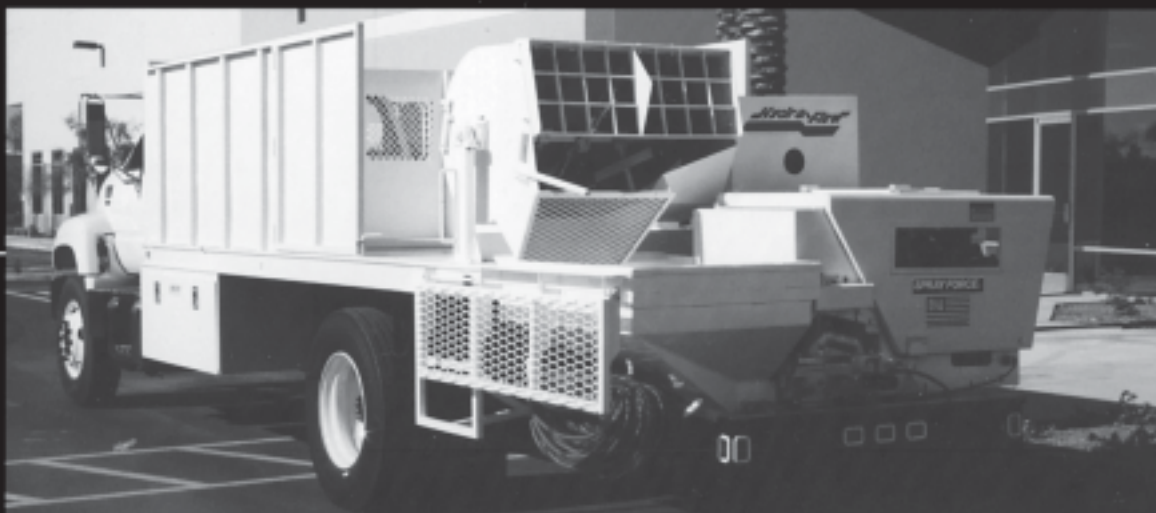
**UNIQUE LIGHTING SYSTEMS** offers a 12-page brochure on the Odyssey line of low-voltage landscape lights. Designed for flexibility in lamp choices and to eliminate glare, the components work with an equalizing hub-wiring system that provides consistent light output between fixtures. All fixtures are made of brass with stainless steel lamp sockets for long service life.

**Unique Lighting Systems**, Escondido, CA.

Continued on page 66

# Astral

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## BACKWASH VALVE

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**PENTAIR POOL PRODUCTS** offers HiFlow, a backwash valve for side-mounted sand and DE filters. Designed to provide precise control of filter functions at flow rates up to 125 gpm, the six-position, positive-lock valve is pre-plumbed for easy installation and features a PVC housing, a one-piece handle, two-inch inlets and outlets for unrestricted flow and permanently marked ports. **Pentair Pool Products**, Sanford, NC.

## POOL/SPA HEATERS

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**JANDY** offers the new Laars Low NOx LX and LT pool/spa heaters. The LX offers advanced digital control and a user-friendly graphical interface, while both heaters meet stringent clean-air standards. Available in 250,000 and 400,000 Btu models, both heaters have specially designed burners for more efficiency, and are ready for complete automation. **Jandy**, Petaluma, CA

## DECORATIVE PLANTERS

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**GAINEY CERAMICS** offers decorative ceramic and fiber-glass planters on a spectrum of colors from earth tones and bronzes to scarlet and teal and in finishes ranging from matte and gloss to metallic, hand-textured/aged and more. The line includes quarter-round and half-round models as well as square, rectangular and round pots and vases in several profiles – tall and short, plain or detailed. **Gainey Ceramics**, LaVerne, CA.

## TWO- AND THREE-PORT VALVES

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**A&A MANUFACTURING** has introduced the Tsunami two- and three-port water-actuated valves. Available in standard top and low-profile side-feed configurations, the valves allow installers to create dual-valve systems without the need for additional electrical devices or connections – ideal for use with fountains, spas, pools, waterfeatures, automatic surface returns and overflows. **A&A Manufacturing**, Scottsdale, AZ.

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## RESIDENTIAL POOL ENCLOSURES

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GARDEN PRAIRIE has published literature on its residential pool enclosures. The 12-page, full-color brochure highlights the enclosures' color-coated aluminum frames and rafters as well as light-transmitting, insulated roof panels that open to allow for natural ventilation. The enclosures are available in custom colors to exacting design specifications and are set up for minimal on-site fabrication. **Garden Prairie**, Garden Prairie, IL.

## DECK-TOP FIREPLACE

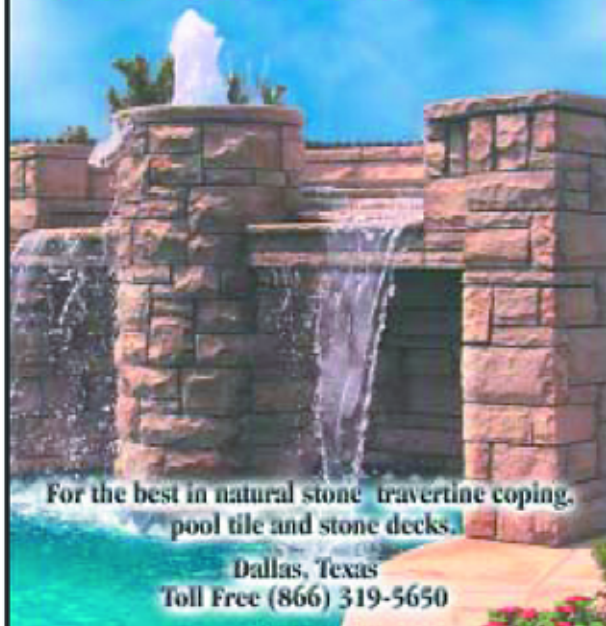
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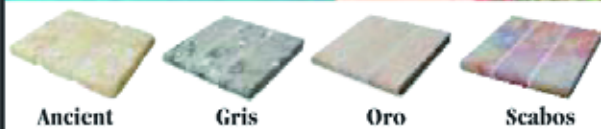
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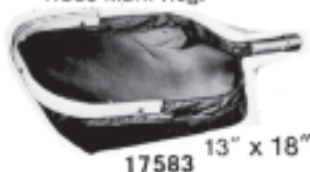
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## ANCHOR-WORM CONTROL

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**AQUARIUM PHARMACEUTICALS** introduces Pond Care Dimilin. Designed to rid ornamental ponds of infestations of parasitic anchor worms that cause unsightly wounds and may lead to secondary infection and even death among fish, the EPA-registered material interrupts the worms' life cycles and reproductive processes and is effective at any water temperature. **Aquarium Pharmaceuticals**, Chalfont, PA.

## POOL ALARM

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**AQUA PROTECH SYSTEMS** offers Aqua Protech 2003, a swimming pool alarm system designed to sound inside the home when an object 15 pounds or larger falls into a pool. Designed for easy interfacing with existing home-alarm systems, the system features reliable components, simple installation, a sensitivity adjustment, battery back-up and swim-time alarm deactivation. **Aqua Protech Systems**, Sacramento, CA.

## POOLSIDE FOOTBALL

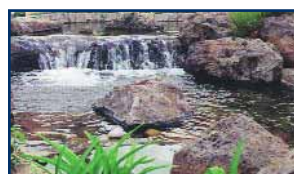
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**POOL SHOT PRODUCTS** offers Aqua-Toss II, a football game for commercial and large residential pools. The game challenges contestants to score touchdowns, field goals and safeties by throwing cushioned, waterproof footballs through three target holes. Made from UV- and chemical-resistant polyethylene for year-round use, the system takes up just six square feet of deck space. **Pool Shot Products**, Ashtabula, OH.

## STONE AND BOULDERS

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## MULTI-VALVE CONTROLLER

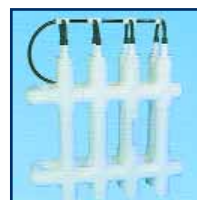
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**ASAHI/AMERICA** introduces the Actuator-Sensor Interface (AS-I) Bus Control System, designed for precise on/off control of up to 31 automated valves. The interoperable network system simplifies installation, maintenance and diagnostics, creating a low-cost solution for a variety of applications requiring precise, individualized control of large numbers of actuators. **Asahi/America**, Malden, MA.

## ULTRAVIOLET STERILIZERS

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**AQUA ULTRAVIOLET** offers a full line of UV-disinfection systems. Featuring long-life, easy-change lamps and quartz sleeves that allow for a 99.9% transmission rate, the modular devices are designed for use on swimming pools and ponds from very small to very large. Safe for fish, the units control or eradicate algae, bacteria and protozoa present in the water without leaving harmful residuals. **Aqua Ultraviolet**, Temecula, CA.

## VACUUM PRE-COAT FILTERS

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**SEPARMATIC FLUID SYSTEMS** manufactures a full line of vacuum pre-coat filters for use on commercial swimming pool facilities. Certified by NSF to ANSI/NSF Standard 50 for pool filters, the units are designed to produce the highest-possible water quality (reducing the threat of cryptosporidium and giardia outbreaks) while offering low operating costs. **Sepermatic Fluid Systems**, Milwaukee, WI.

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## WATER/FIRE FEATURE

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TRAVIS INDUSTRIES has introduced Ring of Fire, an outdoor centerpiece that features a gas fire ring surrounded by three tiers of water jets, with the entire bed lit from below and shining through stones or glass beads. The system can be installed flush in a deck, set in a custom surround or left free-standing; a controller allows for independent adjustment of the fire and water elements. **Travis Industries**, Kirkland, WA.

## STEEL ART TREES

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NATUREMAKER offers one-of-a-kind trees custom-fabricated in steel for use in a range of settings, indoors and out, commercial or residential, as thickets or individual specimens. The super-realistic possibilities range from 60-foot oak trees to banyan trees with complicated root systems designed for child's play. All trees are made in compliance with common seismic, building, safety and fire codes. **NatureMaker**, Carlsbad, CA.

## TILED SPAS

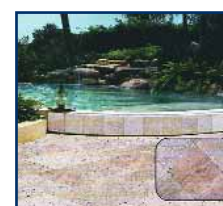
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NESPA offers a complete line of hand-tiled spas. Available in 18 standard configurations as well as custom shapes and ready to be finished with any tile the client desires, the rigid fiberglass spas are completely assembled in the shop and delivered pre-plumbed and ready to install. Standard models for either onground or inground use include swim spas as well as spas designed for hydrotherapy. **NESPA**, Oroville, CA.

## NATURAL STONE PAVERS

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COLISEUM COLLECTION offers marble and travertine pavers in a range of colors. Intended for both interior and exterior applications, the stones are ideal for use as pool decking, in walkways and on driveways, offering opportunities for fully integrated designs. The material is available in a number of standard sizes with either chiseled or tumbled edges, and the coping has full bullnose edges. **Coliseum Collection**, Lake Worth, FL.



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We have limited supplies of most back issues in stock, so go ahead: Build your collection of *WaterShapes*.

☐ **February 1999** (Vol. 1, No. 1)

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

☒ **April 1999** (Vol. 1, No. 2)

**Hopkins** on designing with large rocks; **Hare** on basic hydraulics; **Straub** on shell curing.

☐ **June 1999** (Vol. 1, No. 3)

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

☐ **August 1999** (Vol. 1, No. 4)

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

☐ **October 1999** (Vol. 1, No. 5)

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

☐ **December 1999** (Vol. 1, No. 6)

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

☒ **January 2000** (Vol. 2, No. 1)

**Hart** on designing for model homes; **Zaretsky** on retaining walls; **Chapman** on hybrid pool finishes.

☐ **February 2000** (Vol. 2, No. 2)

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

☐ **March 2000** (Vol. 2, No. 3)

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

☐ **April/May 2000** (Vol. 2, No. 4)

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

☐ **June/July 2000** (Vol. 2, No. 5)

**Holden** on fountain-design history; **Bibbero** on large stones; **Anderson** on making streams work.

☒ **August 2000** (Vol. 2, No. 6)

**Tisherman** on shapes; **Lucas** on watershapes for wildlife; **Ryan & Medley** on the vertical axis.

☐ **September 2000** (Vol. 2, No. 7)

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

☒ **October 2000** (Vol. 2, No. 8)

**Lampl** on natural design; **Anderson** on finishing streams; **Rubenstein** on kinetic water sculpture.

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

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

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

**Holden** on a retro-look design (I); **Fleming** on upscale approaches; **Gutai** on pump technology.

☐ **March 2001** (Vol. 3, No. 2)

**Moneta & Farley** on site-specific design; **Benedetti** on fiberoptics; **Alperstein** on golf-course water.

☐ **April 2001** (Vol. 3, No. 3)

**Jauregui** on inspired clients; **Dirsmith** on frosty fountains; **Tisherman** on deluxe finishing.

☐ **May 2001** (Vol. 3, No. 4)

**Reed** on sculpture gardens; **L'Heureux** on sequenced water; **Brandes** on restoring riverfronts.

☐ **June 2001** (Vol. 3, No. 5)

**Winget** on fun-inspired waterforms; **Holden** on survey formats; **Schwartz** on classic stonework (I).

☐ **July/August 2001** (Vol. 3, No. 6)

**Rugg** on pond basics (I); **Ruthenberg** on perimeter overflow; **Schwartz** on classic stonework (II).

☐ **September 2001** (Vol. 3, No. 7)

**Rugg** on pond basics (II); **Urban** on energy savings; **Pasotti** on interactive waterplay.

☐ **October 2001** (Vol. 3, No. 8)

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

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

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

☐ **January 2002** (Vol. 4, No. 1)

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

☐ **February 2002** (Vol. 4, No. 2)

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

☒ **March 2002** (Vol. 4, No. 3)

**Holden** on a retro-look design (II); **Morris** on wild water; **L'Heureux** on fountain lighting (I).

☒ **April 2002** (Vol. 4, No. 4)

**Oliver** on multi-layer flows and transitions; **Gutai** on pump basics; **Dews** on hiding headwaters.

☐ **May 2002** (Vol. 4, No. 5)

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

☐ **June 2002** (Vol. 4, No. 6)

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

☒ **July/Aug. 2002** (Vol. 4, No. 7)

**Holden** on retro details; **Ortiz** on quality, mid-range pools; **Varick** on grand-scale watershaping.

☐ **September 2002** (Vol. 4, No. 8)

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

☐ **October 2002** (Vol. 4, No. 9)

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

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

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

☐ **January 2003** (Vol. 5, No. 1)

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

☐ **February 2003** (Vol. 5, No. 2)

The **Beards** on collaboration; **Yavis** on custom vinyl-liner pools; **Mitovich** on Microsoft's campus.

☐ **March 2003** (Vol. 5, No. 3)

**Fowler** on habitats for marine mammals; **Benedetti** on outdoor kitchens; **Dews** on planting pockets.

☐ **April 2003** (Vol. 5, No. 4)

**Shoplick** on watershapes as teaching tools; **Gutai** on water flow; **Schwartz** on Maya rockwork.

☐ **May 2003** (Vol. 5, No. 5)

**Zaretsky** on sensory gardens; **Freeman** on hydraulic retrofitting; **Hanson** on water/stone sculpture.

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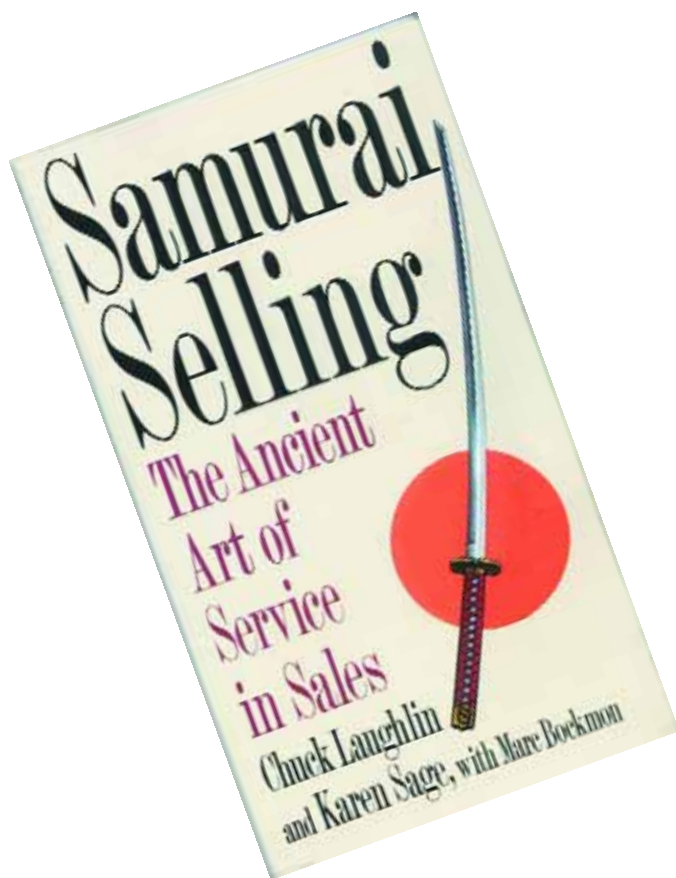
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## Those Who Serve

**B**ack in February's *WaterShapes*, I stepped a bit beyond the usual in discussing *Harvests of Joy* by Robert Mondavi, noting that I'd read the book based on a recommendation from fellow *WaterShapes* columnist Brian Van Bower. I also mentioned that the book was one of the most important I've come across in recent years.

This time around, I'd like to review another of Brian's recommended books – one he suggested during a seminar I recently attended and which has also proved to be wonderfully useful and *extremely* influential: *Samurai Selling: The Ancient Art of Service and Sales* by Chuck Laughlin and Karen Sage with Marc Bockmon (St. Martin Press, 1993).

Until I read this book, my sense of what Samurai were all about was based on no more than warrior movies and video games. What I learned instead is that Samurai based their lives entirely on a concept of service (of which warfare was only a small part). The authors use the philosophy of the Samurai to define excellence in sales and service through a series of allegories that compare traditional tales of the Samurai to modern-day situations in business.

In rapid order, the book defines what it means to provide outstanding service in a way that extends the lessons well beyond the actual sales challenge. The authors cover several important concepts, starting with the concept of “ki” and the energy we generate through our minds, hearts

THE AUTHORS USE THE PHILOSOPHY OF THE SAMURAI TO DEFINE EXCELLENCE IN SALES AND SERVICE THROUGH A SERIES OF ALLEGORIES.

and spirits and working through to “balance,” a concept illustrated by four circles representing integrity, discipline, creativity and fearlessness. Along the way, they offer advice on means of strengthening desirable personality traits and reaching a place where all four of the circles intersect. There's also a particularly amazing discussion about the importance of maintaining an open mind, or, as the authors put it, “a beginner's mind.”

Personally, reading this small book (just 160 pages) has shed a whole new light on the way I provide service to my clients and has shown me ways I can make significant improvements in my day-to-day approach.

This is important to me, because in the past I've had occasion to wonder why it is, as a designer and builder of what I consider to be some darn fine pools, that I don't receive more referrals – all while people who do lesser work seem to collect them with ease. Having read this text, I can see that I've used the fact that the end product I provide is top-notch to justify, in my own mind, some less-than-outstanding service.

Wanting to make a change, I've started small by employing Brian Van Bower's policy of returning calls promptly, which seems utterly congruent with the book's message. Within a month, I received two quality referrals from a satisfied customer who talked more about the level of care and attention he'd received than he did about the beautiful pool in his backyard. It's a small step, but I'm encouraged all the same and anxious to keep improving the service I provide.

If you can't tell, I love this book. It strikes me that there are infinite ways, large and small, that most of us can improve our service to our clients, our companies, our friends and our families. Just as I did in reviewing Mondavi's wonderful book, I back up Brian's endorsement with my own strongest-possible recommendation for *Samurai Selling*.

Neither text has much to do with watershapes in any direct sense, but both have *everything* to do with how we approach our chosen professions. **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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