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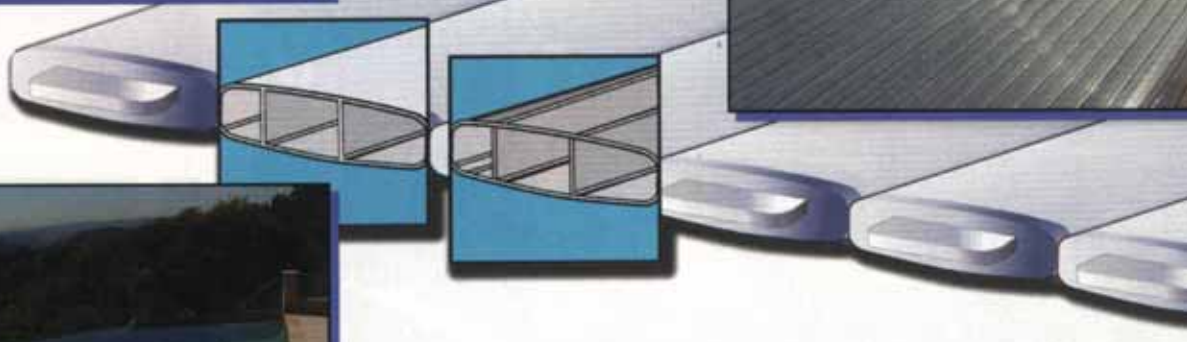

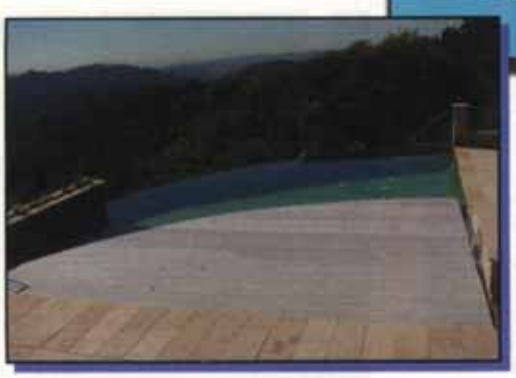

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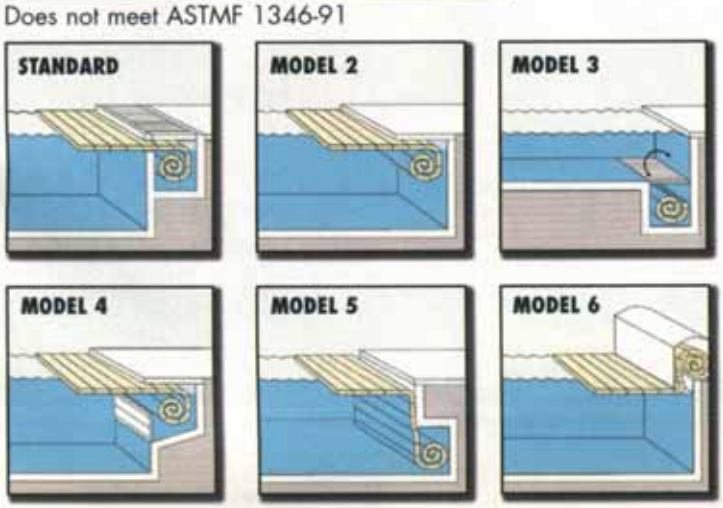

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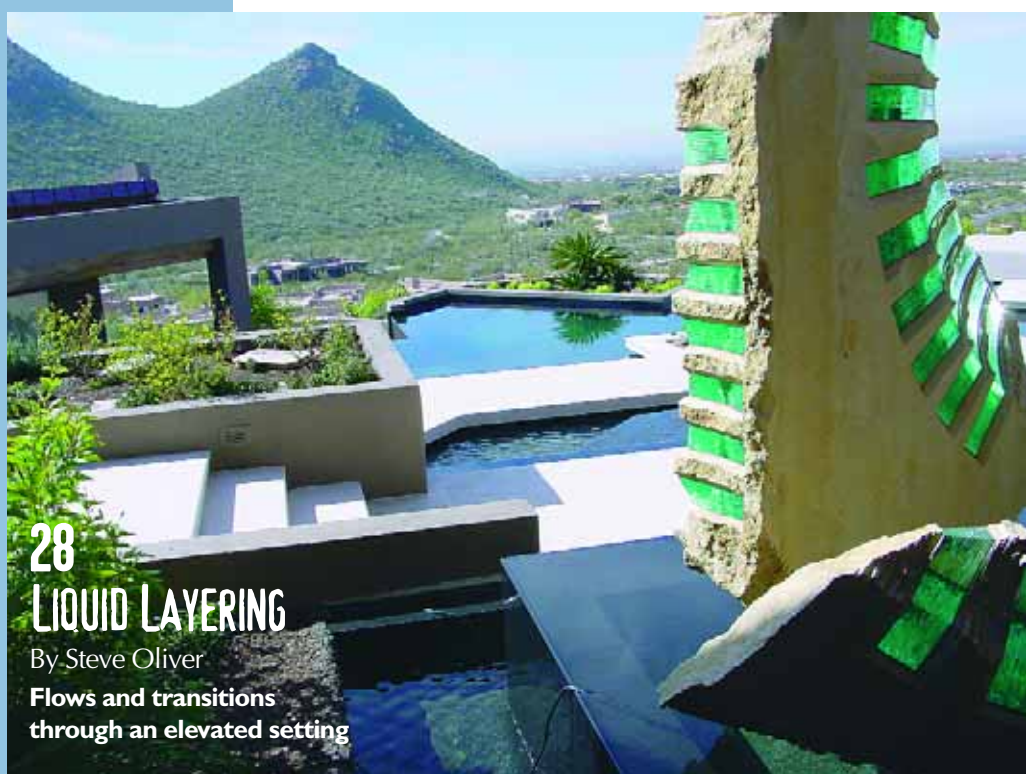

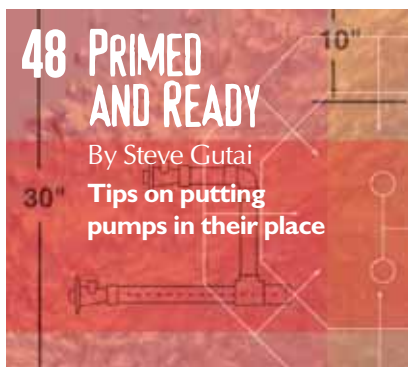

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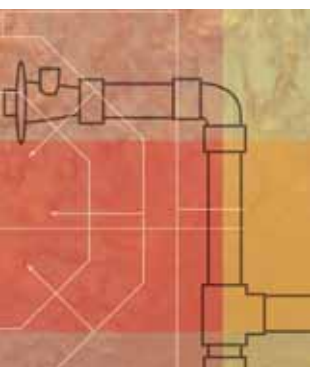

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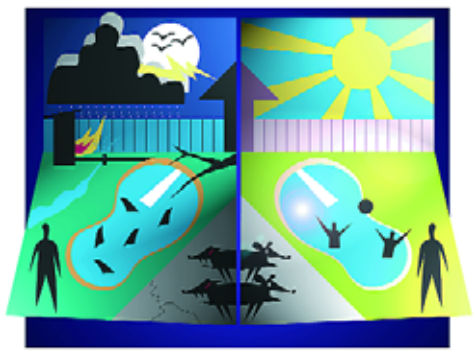

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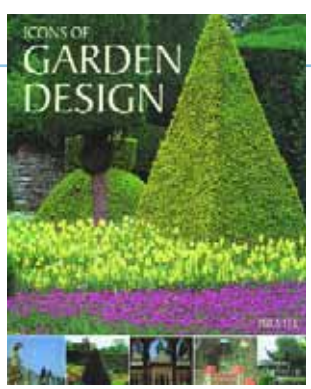

DEPARTMENTS

On the cover:
Photo courtesy Bob Dews,
Extreme Ponds, Cashiers, N.C.

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The Heart of the Art

There's a natural tendency to think of artists as dreamy, distracted types devoid of any aptitude for or interest in things technical.

When you study just about any art form in depth, however, you soon realize that the opposite is true. In fact, most often the greatest artists are those with advanced technical training and skill who've learned how to apply what they know with sublime ingenuity and subtlety. It is this foundation in science and technology that enables them to express themselves so artistically.

Consider how great artists from antiquity to the present use the nuances of metallurgy or masonry and structural engineering to raise their greatest works. Is there any doubt that enduring structures from the Sphinx to the Eiffel Tower or the Statue of Liberty would fall to rubble were it not for their designers' accurate use of engineering principles? Or how essential it is for the world's great painters and illustrators to understand color theory, perspective and anatomy to lay down their timeless images?

In some modern arts – photography, cinematography and computer graphics, for example – technology and art are inseparable. And when it comes to something like architecture, the artist's work is far more a science than most would recognize.

The art of watershaping is no different from the rest. Today's best watershapers possess a range of technical knowledge, skills and sympathies drawn from a list of disciplines that includes geology, materials science, structural engineering, electrical, water chemistry, biology, botany and hydraulics.

All of these are important and warrant close examination and study, but it is the last discipline, *hydraulics*, that gives watershapes of all forms their handiest distinction.

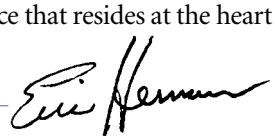
No matter the design or complexity of *any* watershape, it is the water and how it is used and circulated that remains its most compelling aesthetic element. And water is a truly dynamic compound, one that requires the deft balancing of pressure and flow, filtering and treatment, replenishment and containment to be successfully used – *shaped* – to the greatest possible effect.

For all that, understanding and practicing good hydraulics is something far easier said than done by many watershapers. As Brian Van Bower observes in his column in this issue (page 10), the hydraulics applied to swimming pools too often is characterized by grotesque equipment sets that waste energy, make noise, break down and confound service professionals. Think as well of fountains turned to planters and the unsightly pond water found in too many parks before you think this is all about pool builders.

Because hydraulic know-how is so fundamental to the watershaping arts, we're introducing in this issue a new set of tightly focused articles on this subject. Beginning on page 48, regular contributor Steve Gutai offers the first of many articles he'll be writing for us on the subject of hydraulic fundamentals. This series will appear in many upcoming issues on very specific topics related to plumbing, equipment and theory.

He gets things going this time with a look at proper pump installation – an absolute necessity in any successful watershape.

Whether you're a veteran contractor in need of a refresher course or a newcomer in need of tips on making water respond to your needs as a designer or installer, this series will help you understand and master a science that resides at the heart of the art of watershaping.



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Bob Dews is founder and president of Extreme Ponds in Cashiers, N.C. His focus is on designing and engineering watershapes that emulate the natural streams and cascades of the mountainous areas where he lives in western North Carolina, and he credits the abundance of these natural waterfeatures for his past and continuing education in the field. During the past several years, Dews has conducted seminars and written extensively in the pond industry to help educate the trade in the importance of "naturalizing" artificial water systems. When not designing and engineering his distinctive brand of watershapes in the Blue Ridge Mountains, Dews and his family operate a small motel they own in Cashiers.

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

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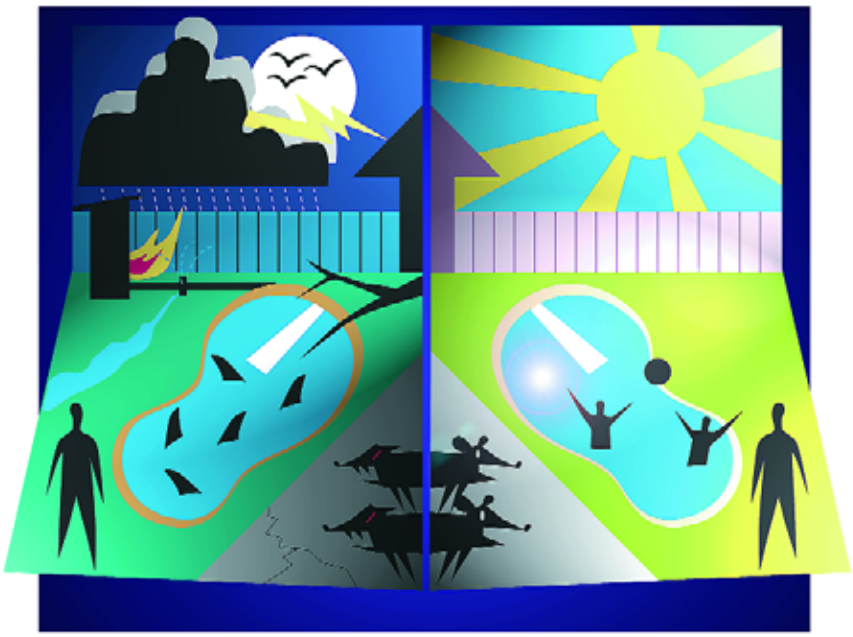
Steve Oliver is owner of Creative Water Concepts, a Scottsdale, Ariz.-based firm that designs and builds ultra-high-end custom residential pools and spas. He started his career in the swimming pool business 32 years ago, working as a laborer in his hometown of Chicago. He steadily learned all aspects of pool and spa construction and eventually took to designing and overseeing his own projects from start to finish. Seeking a warmer climate, Oliver moved to the Phoenix area in the early 1980s and established his own firm there in 1986.

BY BRIAN VAN BOWER



Just the Opposite

Hydraulic science stands literally at the heart of a swimming pool system, and the fact of the matter is that most pools are suffering with bad cases of clogged arteries.

Is it honest to say that too few of the swimming pools you find in America's backyards are what one could call well built – and that even fewer of them are well designed? I think so, because so many of the pools I see run like junk and look like junk, and it's way too easy to find installations that lack any apparent relationship to their settings, their homes' architecture, the landscaping or any recognized design standard.

The environment out there is so unfortunate that when David Tisherman, Skip Phillips and I teach our Genesis 3 schools, Skip starts by telling our students to look at what the pool industry does – and do the exact opposite.

That's an outrageous thing to say, and his intention clearly is to be provocative. But even though we all offer up the axiom with humor and it invariably draws laughter from the crowd, there's a nasty bit of truth here, and our recommendation holds up surprisingly well under even the closest scrutiny.

Truth be told, this simple wisecrack really helps people understand where we're coming from in our classes. It sets the proverbial bar of performance at a different level from the status quo, and as a result this single statement has become synonymous with our approach to watershaping.

The Heart of the Matter

The nature of aesthetics makes it tough to make a quick argument, so let me illustrate what I mean with a fundamental, practical issue and a few words about hydraulics.

Hydraulic science stands literally at the heart of a swimming pool system, and the fact of the matter is that most pools are suffering with bad cases of clogged arteries. Even today, when the trade media and seminar schedules are brimming with information that should at least help ease this condition, you nonetheless can go onto just about any job site and find pipes that are too small, pumps that are too powerful, filters that are way too small and tangled equipment pads that sap circulation-system efficiency even when everything is sized properly.

This is *not* new information, and anyone you talk to who builds pools pays lip service to the notion that sound hydraulic design is important. But I know for a fact that I could walk around just about any neighborhood in just about any market anywhere in our country and find a pool being installed with a 2-horsepower pump on 1-1/2-inch plumbing with a 75-square-foot filter – and, lest I forget, a knot of piping too intense for the tender sensibilities of young children.

It's frustrating, and at this stage of the game you'd think we wouldn't still be fighting this battle, yet we are. And it's not so easy to understand why this is so, because if it were all about cutting costs, saving money and squeezing a few extra percentage points into the profit margin, you wouldn't be finding all these upsized, high-head pumps – which are, after all, more expensive than fractional-horsepower pumps.

For all that, countless contractors sell and install 1-1/2-, 2- or even 3-hp pumps on small systems because they think that's what consumers think they want. After all, if bigger is better when it comes to horsepower and automobiles, bigger

must of course also be better when it comes to swimming pool pumps.

This is, in fact, the exact opposite of what should be done. This is hydraulics, not drag racing.

So no matter what you assume your clients want, you should be beefing up your circulation system in terms of pipe size, the number of suction and return points and filter size while *reducing* the size of the pump. The system will work better in every conceivable way and the trade-offs in costs are basically negligible – even on modest projects.

Bucking the Minimums

The pool industry is similar to many other construction trades in maintaining a set of guidelines that specify "minimum standards." For our industry, the National Spa & Pool Institute and American National Standards Institute publish *ANSI/NSPI #5*, the recognized standard for residential swimming pools.

We all must bear in mind that these really are *minimums* – and that in order to satisfy your clients, you need to do all you can to exceed those baselines.

To illustrate what I mean, let's explore a key point in the standards – where *ASPI/NSPI #5* mandates a maximum water velocity in suction piping of no more than eight feet per second. If water flows through the pipe any faster than that, you're working outside the minimum standard.

In the real world, a 2-inch suction line can handle a maximum of 80 gallons per minute (gpm), a 2-1/2-inch line 110 gpm and a 3-inch line 180 gpm. Clearly, the larger the line, the more water you can move. But upsizing the plumbing is not the approach most people take when trying to increase flow: Instead, they specify bigger pumps.

Yes, I know that you have to calculate the specifics for each system and that in select circumstances a bigger pump might be required, but all too often we find that when you upsize the pump instead of increasing the plumbing size, you're going to violate the maximum flow rate set up in the minimum standards.

This is plain dumb. The bigger pump is more expensive and is going to make more noise, will be more likely to cavitate, will use way too much energy and definitely will break down sooner than it should. Yet I still hear people say that upsizing the plumbing drives up cost, so they prefer to use a bigger pump.

Look at a regular pool with a 2-inch main drain (let's not even mention the 1-1/2-inch "minimum"): To change from a 2-inch line to a 3-inch line for a 50-foot run is less than $40. How much would it cost to upsize the entire plumbing system? You don't need a calculator to know it's not more than a few hundred dollars on most jobs, and there's no more labor involved because it's just a matter of using a fatter pipe.

Larger piping means you can use a

medium-head pump that not only operates at a higher efficiency but also costs considerably less. And you can use a fractional-horsepower pump that will work far more efficiently against less head pressure while moving more water.

In other words, do the opposite of the status quo on this one and you'll be just fine.

Down the Line

You can go through the entire circulation system and see similar sorts of obvious economies and benefits:

❑ Consider **skimmers**, for example. Much of the pool industry still puts just one skimmer on smaller pools, and this works within the minimum standard, which calls for just one skimmer per 800 square feet of surface area.

In most places I know, however, the wind shifts direction from time to time. So why not use two skimmers located on opposite sides of the pool to catch debris flowing across the surface in different directions? Less debris will sink to the bottom, the pool will be cleaner and look better more of the time – and it will be easier to service.

In terms of raw cost, adding a second skimmer – plumbed independently with at least 2-inch plumbing – will come in at about $200.

❑ Look at **filtration**: How many projects are set up "automatically" with a 75-square-foot filter? That describes most of the projects in my area, but if you read the specifications on filter flow rates, you'll see that many of these filters are badly over-challenged. A 50-square-foot cartridge filter might be rated for a recommended flow rate of 50 gpm, as an example. Consider the effect of a 3-hp pump moving water at a rate of 160 gpm through 2-inch plumbing and you see that water is literally being rammed through an undersized filter.

I recommend doing the opposite and putting a big filter on the system. Yes, they cost more and take up more space on an equipment pad, but the benefits with respect to hydraulic performance, water clarity, service life of the filter and, ultimately, customer satisfaction can be priceless. That's why I always install what some people consider to be oversized filters – 300 square feet, 400 square feet, multiple filters, whatever it takes.

In terms of performance, there is no downside to using large filters. My customers appreciate the improved water quality and a cleaner pool.

❑ To complete the circuit, let's look at **return plumbing**. Again, why is it that we still see 1-1/2-inch plumbing on return lines? And why is it that we also see so many installations with the minimum number of returns? Yes, two returns on a 20-by-40-foot pool will move the water around a little bit, but why not use four returns to increase flow and efficiency?

I plumb all my systems with return loops feeding multiple returns. The water flows evenly around the perimeter of the pool, equalizing flow and pressure at all return points. And I install eyeball fittings so that I can "tune" the pool to create a circular flow pattern that pushes the water past multiple, strategically placed skimmers.

With multiple returns plumbed on a loop, chemicals are mixed more quickly and effectively, heated water is dispersed more evenly, and the water stays cleaner and is easier to maintain. It's all to

the good, so why sacrifice increased performance for want of a few feet of plumbing a couple more inlet fittings?

More or Less Forgiving

Properly designed and installed systems, especially those that go beyond the so-called minimum standards, work better than most systems you find out there in America's backyards. And they work better under a broader range of conditions than those built to satisfy (or fly under) the minimums.

I've seen a great many pools, for example, that stand near heavy landscaping or beneath overhanging tree branches. From a service perspective, plant matter in the water can be a real headache, but if the system has multiple skimmers, efficient flow in and out of the pool and through the filter, and an adequately sized filter, plant debris isn't nearly the problem it would be in a system where the majority of the stuff floats unskimmed, becomes waterlogged and sinks to the bottom.

The fact is, when clients are presented

How Low Can You Go?

Let me be clear in my thoughts on the pool industry's "minimum standards": Although I certainly endorse the idea of publishing them as a baseline, it's important to point out that nowhere do these documents say that you shouldn't *exceed* those standards.

To my mind, quality in construction means that you're working nowhere near *anything* defined as "minimum." But what we find all too often is contractors who see minimum standards as a high bar of performance and who apparently do all they can to fly below the standards.

Whatever the source of this attitude, the results are grim. My advice: Focus your efforts so high above and beyond the minimums that performance of your products is never something that is called into question.

– B.V.B.

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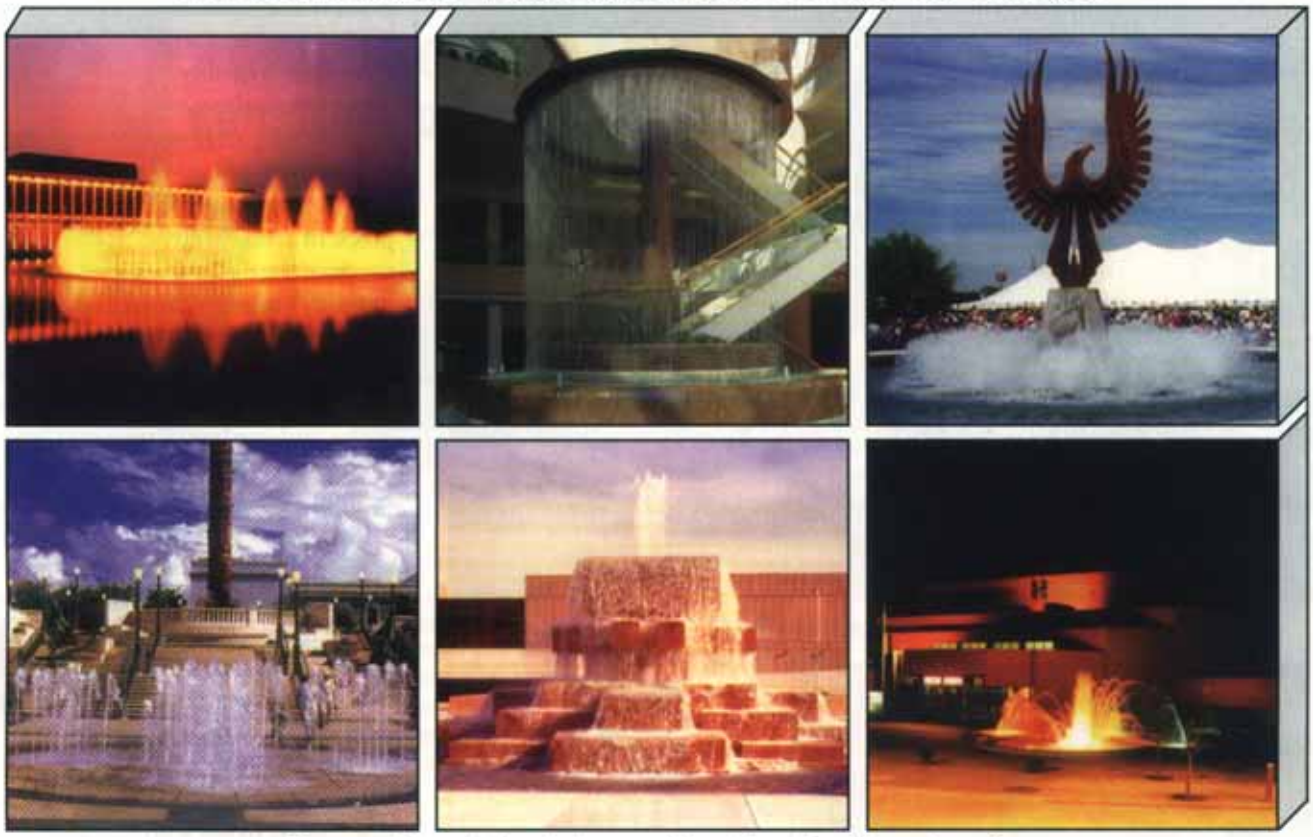

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with options and the long-term value of those options is clearly explained, they want better stuff. If you're uncomfortable insisting on the use of upsized plumbing, multiple skimmers and returns or big filters as a matter of policy, try offering these things as options. My guess is that even cost-conscious, mid-level customers will spend the extra scratch for a quality system, especially if you outline the positive trade-offs in terms of long-term energy efficiency and serviceability.

This might even be the core of our problem as an industry: I do believe that much of the difficulty arises because the industry's salespeople don't understand the impact these issues have on the products they sell. They're sent out on sales calls armed with standard templates and configurations and have no clear sense of what is involved in designing a pool system.

Hydraulics is just one area where this approach falls flat: This sales effort also falls short where critical issues of geology and necessary structural details are involved. In some cases, the results are catastrophic; in others, it all just becomes miserably unsatisfactory.

Skip Phillips often describes the process of selling and bidding pool jobs as a contest to see who can degrade the product the most. However harsh that seems, when you look at what some people sell in the name of being competitive, I'd have to say that he's right on target.

If you want to be successful over the long haul – and especially if you enjoy making your clients happy – it all boils down to a no-longer-humorous recommendation: Look at the way the pool industry's rank and file do things and do just the opposite. 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.

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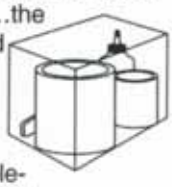

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BY STEPHANIE ROSE

Ornamental Choices

Last month, we discussed ornamental grasses and their place as the most natural of all companions for watershapes. Now it's time to look at a few of your grass options, including something for just about every need and taste.

Ornamental grasses come in such a wide range of sizes, climate preferences and colors that there really is at least one choice that will work in any client's yard. With so many choices, I'll have to narrow the list down to my personal favorites here. I'll also be suggesting some plants that aren't traditionally considered to be ornamental grasses; these are some "grass-like" plants I use as required to meet a particular design's needs.

As always, I recommend checking your local garden guides for selections that will do well in your climate and zone. I also must mention that while the list below covers a lot of ground, it doesn't include all the great grasses you can find with a bit of hunting. These are *my* favorites:

Ornamental grasses come in such a wide range of sizes, climate preferences and colors that there really is at least one choice that will work in any client's yard.

❑ **Ophiopogon planiscapus 'Nigrescens'** (Black Mondo Grass). I'm a huge fan of contrast, and this unusual selection stands out against any other foliage. Its narrow black leaves grow no higher than about nine inches tall and typically stay within a one-foot radius.

It can be used in mass as a ground cover or as a filler in a spot that needs something to break up a flat design. People will definitely notice this plant in any setting, particularly when it's placed next to blue or very light-colored foliage, and the great contrasts it sets up make it a conversation piece in any garden.

❑ **Ophiopogon japonicus** (Mondo Grass). This is a great ground cover for slopes as well as flat areas. The regular variety forms dense clumps that, in my opinion, can start to look unattractive over time. It can, however, be dug up, easily divided, and spread out to cover a larger area.

I particularly like the dwarf varieties. They grow quite slowly, do not overgrow and can be used as a very low ground cover. Planted close together, they create a dense blanket that stays dark green throughout the year.

I've also used Dwarf Mondo Grass to partition off diamond-shaped plots in a formal herb garden. You can get very creative with this plant, drawing lines or shapes with it to define a range of design features.

❑ **Liriope spicata 'Silvery Sunproof'** (Variegated Liriope). I discovered this gem while filming an episode of "The Surprise Gardener." I was designing and installing a very shady garden and needed to demonstrate how shade gardens can have lots of color and contrast.

The nursery was completely out of at least half the plants we wanted. When I spied the Variegated Liriope, I knew we'd been saved. It grows particularly well in a shady environment, and because its leaves are light green with stark white variegation, it stands out in the shade, giving the appearance of a dappled light shining through the trees.

Variegated plants are always a great way to brighten up a shady area. Although Liriope is not really considered an ornamental grass, its shape enables it to substitute for grass-

es in an area where you'd hoped (as we had) to plant a grass. There are non-variegated varieties, but this one has been my ongoing favorite. It has a mounding form that stays below a foot in height.

❑ **Festuca ovina glauca** (Blue Fescue). I grew up with Blue Fescue in my front yard and swore I hated the stuff. As with many other things in my life, however, I've learned to eat my words gracefully. Along with Blue Oat Grass and some of the other blue-foliage selections, this is one of the best contrasting foliage plants out there.

A low grower, Blue Fescue is a great filler or massing plant, and you can place it next to almost any plant for contrast. It makes a great ground cover, growing no higher than about nine inches, and can be used in the same ways as Mondo Grass or Dwarf Mondo Grass. It sends out a wispy, oat-like "flower" stalk. These flowers are actually interesting for small arrangements.

❑ **Helictotrichon sempervirens** (Blue Oat Grass). This grass is so similar in appearance to Blue Fescue that you might be hard pressed to tell them apart. And they're actually great companions, with Blue Fescue best for smaller spaces and Blue Oat Grass preferable when something slightly larger is needed.

Blue Oat Grass averages two to three feet in height and spreads to about 18 inches, with flowers that look almost identical to those you see with Blue Fescue. As with other non-green foliage plants, it creates striking contrasts against other plants.

❑ **Stipa** (Feather Grass). This feathery grass adds a nice, soft touch to any design. Planted among larger leaf plants, it's quite effective at breaking up strong lines and adding gentle movement.

It's a nice addition to any style of garden. Although it comes in quite a few varieties, I prefer the smaller ones that peak at three feet. The blooms are similar to those of other larger grasses, with feathery plumes atop tall stalks.

❑ **Imperata cylindrical 'Rubra'** (Japanese Blood Grass). It's often difficult to find great plants with red foliage, so this particular plant is quite a standout in any setting. Usually growing to about a foot tall, its striking red foliage is a great contrast against any other plant.

Placed next to gray, blue, or other light toned plants, it even becomes a focal point in a design. The one drawback of this grass is that it's deciduous and dies back in the winter. To avoid gaping holes in a garden, I suggest planting Japanese Blood Grass where its withering stalks will be hidden, such as behind a small boulder.

❑ **Cyperus** (Papyrus). This is one of the most important plants in the kingdom. Not only is it a great-looking spec-

imen, but it has also been used for thousands of years to make paper. Its tall stalks are crowned by wispy pompon-like plumes and add height and dimension to a design.

Papyrus grows well in swampy conditions and in well-watered gardens, so it's often used to lend a natural touch to ponds and other watershapes. You can use the regular variety, which grows to between six and 10 feet in height – or, for a smaller area, a dwarf variety that will stay around the two-foot mark. In either case, its unique shape makes it a departure from the other grasses.

❑ **Pennisetum (Fountain Grass).** Although it's most often seen as a roadside staple in California, Pennisetum is quite useful in many gardens. It's probably one of the best-known grasses, growing to three or four feet in height and spreading to cover about five feet over time.

I particularly like the "Rubrum" variety, with its bronze/burgundy foliage topped by tall stalks and feathery beige plumes. It's best used in smaller proportions in a garden, as its dark foliage can overwhelm a design if used too much. I like to mass it in spots, bordered by green-leafed plants. Or, for something more dramatic, try framing it with gray foliage plants.

Many Pennisetum varieties self-sow very freely , so try finding the more sterile varieties (check with your nursery and ask lots of questions). And for winter, instead of shearing the plants to the ground, try thinning out dead or withering stalks to avoid the appearance of overpruning.

❑ **Miscanthus.** This is another of the great standards of the grass family. Its height and blooms combine to give it a strong presence in any garden. Growing as high as 10 to 14 feet and eight to 10 feet wide, its stalks often droop, giving it something of a weeping appearance. You will find a range of varieties in foliage color and flowers from which to choose.

Miscanthus also makes a nice winterscape plant in many climates. Most varieties are deciduous and in warmer climates they might winter over. But in colder climates, the foliage often turns brilliant colors before dying to the ground. Do your homework first, experimenting with an unusual variety to add a unique touch to a watershape.

❑ **Juncus** (Rush). One of the fun members of the grass family, juncus is a very commonly used plant inside watershapes. The corkscrew variety looks like a bad curly hairdo and definitely becomes a conversation piece in any pond.

Juncus differs from most other grasses in that its "leaves" are narrow reed-like structures, similar in shape to chives or onion greens. It typically varies in height from two to four feet. Many varieties are upright, but corkscrew jun-

The possiblilties are virtually endless when you start using grasses in land- and waterscapes. Their range of colors, sizes and textures makes them a natural fit with just about any garden style.

cus flops all over the place – yet in a small enough area that it can be kept in check.

❑ **Cortaderia selloana** (Pampas Grass). Best saved for a large area where it can spread out and not touch (and injure) passersby, this giant grass is used in many natural plantings. Its long, narrow leaves have delicately toothed edges that can be as sharp as razors when brushed.

The larger varieties can grow to 20 feet tall and 13 feet wide, although I don't recall ever having seen one bigger than about 12 feet high even with the flower stalks. I particularly like the "pumila" or dwarf variety, which stays below four feet and doesn't spread out over time.

Interestingly, the large, puffy plumes of pampas grass flowers are one of the most widely used plants in the Tournament of Roses parade on New Year's Day. It simulates animal fur quite well! WS

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

BY DAVID TISHERMAN

Good Groundings

Last time, I mentioned initial meetings and discussions having to do with a retrofit project in Pacific Palisades, Calif. I call it a "retrofit" because we're using a portion of an existing pool shell as part of the new one, but in truth this is really a ground-up reworking of the entire environment.

This project displays the influence that architects Ricardo Legoretta and Luis Barragan have had on my thinking about shapes, colors and spatial relationships. As soon as I saw this place, in fact, the work of both came to mind because of the strong colors and materials and the expressive modern styling of the house.

Beginning with this column, we'll trace the various steps involved in executing and detailing this great project. For now, we'll begin at the beginning with the demolition and site preparation stages.

Out with the Old

The new swimming pool will be substantially narrower than the existing abomination of a vessel (which had been slammed right up against the back of the house). In addition, we'll also deal with a "retaining" wall that sits partially on the bond beam and partially on natural material with no slip joint between.

The new work will incorporate several properly scaled water effects, and we're also adding a spa to the pool and basically reconfiguring the entire yard to provide more space for landscaping and areas for meditating and entertaining.

The original pool and its retaining wall seem to have had but one purpose – and they have it in common: Neither accomplished much of anything beyond cutting the yard in half.

We'll be introducing a great deal of color to the setting, including a highly unusual red plaster on the interior surfaces of the pool and beautiful handmade, custom-glazed tile that will include a warm palette of (probably) purples, whites, yellows, blues and reds. The new work will incorporate several properly scaled water effects, and we're also adding a spa to the pool and basically reconfiguring the entire yard to provide more space for landscaping and areas for meditation and entertaining.

We began construction in January of this year. At this writing, the plans have been completed and we've obtained permits from various agencies and the building department. We've also done the soils testing – and based the reconstruction plans for the pool and decks on this all-important information.

The customers have fully signed on with the process and are excited to watch the transformation of their backyard from a poorly conceived mess into an area that is very much an extension of the style and beauty of their home and tastes.

The construction process began with an on-site meeting I set up to familiar-


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ize various trades with what would be happening. On hand were the excavator, the plumber, the electrician, the forming carpenter, the landscape installer and my mason. We talked about what needed to be accomplished in the early stages of the project, covering a variety of material-installation details and, most important, the scheduling. All of this is extremely important in a job like this where we have such extensive demolition work.

This pre-start meeting isn't anything unusual for me. In fact, I call such a meeting on every project I do because I firmly believe that quality flows from this sort of cross-disciplinary communication: If we all start on the same page, it's more likely we'll stay together as the project unfolds.

This meeting is also important because it establishes my level of participation in the project. I personally supervise all phases of construction. At this level, I don't believe you can set things up and

We jack-hammered out a set of steps to make way for a new spa that will be fully and properly integrated with the existing shell.

cut subcontractors loose to do what they think is proper – and I'm not certain it's desirable at *any* level, from modest to magnificent.

Let me repeat myself: I think on-site supervision is absolutely critical to success, and I need people who will be working with me to know that I'll be around almost every single day – and will *always* be on hand when anything important is in the works.

As the project moves forward, I'll have several meetings similar to this one with key sub-trades. To my mind, it's all part of establishing channels of communication and building in quality at every step.

Getting to Work

Before a single spade was plunged into soil, we called in Dig Alert, an organization in California that helps contractors locate underground gas, water and electrical lines. These pathways were clearly marked so we could steer clear of them. The landscaper also came out early to disconnect, cap and (as necessary) re-route sprinkler lines.

The electrician made an important visit, stopping by to locate the service and kill all electrical lines leading to the backyard, including those for the old portable spa, the landscape lighting, the equipment pad and whatever else he found. This is particularly important for both safety and convenience.

Personally, I don't like to "pigtail" off the electrical panel: That's a poor way to do things. If we must, as an alternative we'll set up a temporary conduit run and junction box for the area where we're working. In this case, however, there were adequate electrical outlets for our needs.

We'd also begun the work of removing all the existing concrete and hardscape along with assorted construction debris. Before long, the site was cleared of everything but the pool's empty shell. Stripping away all the decking and old plaster was important: The plans called for using a portion of the original shell in forming a new one, and I had let the homeowners know that the entire project hinged on the shell's passing a detailed inspection.

Way back at the beginning of the process, a quick inspection of the pool revealed some superficial cracking and some spots where rust was bleeding through the plaster. I let my clients know that, because the plans called for using the old shell, we'd have to strip the plaster and get a good look at the condition of the gunite.

Once the pool had been emptied, we cut a hole in the floor of the pool at the deep end to prevent hydrostatic pressure from building up around and maybe popping the shell. Given the pool's position at the bottom of a huge slope, this was a legitimate concern – especially because the shell would be empty heading into Southern California's rainy season.

Once the plaster had been stripped, we determined that the cracking had no structural implications and that the rust had resulted from the steel being too

Once the plaster and decking were stripped, we knocked off the top of the portion of the shell that will no longer be used to keep it from telegraphing its presence back to the surface. Note the holes in the floor: We don't want water to collect in the unused part of the original shell.

With the framing for the new wall set, it's already easy to see how much the new outline of the pool will change the look of the backyard and the impression it makes.

With sturdy framing in place, we're ready for the next steps in the process – and to tie the new wall and spa into the old structure using steel (seen clearly in the foreground) that we preserved in the demolition process.

close to the gunite's surface in a few spots. Stripping the plaster early in the process gave us valuable information about the condition of the shell – which was, it turns out, in acceptable shape – and it was something we would have needed to do later on anyway to ensure a good bond for the new finish we'd be applying.

Thinned Down

As noted above, the pool is being reshaped and made narrower by constructing a new pool wall inside the existing structure. We'll also be making it shallower to render it more child-friendly and energy efficient.

We started by cutting down the existing bond beam 18 inches below grade on the side where the new wall will be installed. I did this so I could come in later and backfill behind the new wall and effectively bury the old wall with landscaping and decking. If we had tried to cover the top of the existing wall *without* cutting it down, over time the soil would have settled and the outline of the old pool would have telegraphed itself to the surface.

We also cut holes in the bottom of the shell, each two feet square at 48-inch intervals, just outside the line where the new wall will be placed. This will allow more-than-ample drainage from the portion of the old shell that will no longer be asked to hold water.

Next, we sliced out four portions of the wall in the part of the shell we'll be keeping, the first to allow for easy penetration of the spa-related plumbing runs, the second to serve as a slot for a new skimmer that won't be the first thing my clients and their guests see when they look at the pool. (The old one had been in the middle of the wall opposite the house.) In both these cases, we preserved the steel rebar and will tie new work into the old to maintain the integrity of the bond beam.

We also blew out two sections of the original wall for 20 inches around the points where the new wall is to intersect the old shell. Once again, we kept the rebar intact and will use it to tie the new wall securely into the original structure.

Once the new wall is shot, we'll backfill the unused portion of the old shell with compacted gravel and cover that with a compacted fill blanket two feet thick. Of course, before we do that, we'll need to build the new wall – a detail we'll get into next time along with information on forming for the new spa as well as setting up the new plumbing and electrical runs. VS

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.

Liquid Laye

ring

In his designs, custom watershaper Steve Oliver finds steady inspiration in the simple grandeur of water as it flows from one level to another. In the project seen here, for example, he uses an array of vanishing edges and gentle cascades to enhance and extend views from a home on the rim of the Arizona desert, weaving multiple water effects into a composition full of visual delights for his clients.

By Steve Oliver

One of the things I like most about working with water is that it makes statements that don't require much verbal explanation.

In fact, I like to think that the projects I build speak volumes about my clients' desire for something creative and interesting. They also speak to the point that most of my clients grant me the freedom to give my very best effort, both aesthetically and technically, without many constraints.

Not all the work I do is so modern in style or approach as the project pictured in these pages, but this one illustrates a principle that's become a hallmark of my designs: I'm inspired by the flow of water and coming up with creative ways to govern its movement from one level to the next. As I work, I also enjoy finding new ways to use water to create visual links between my watershapes and the landscapes, architecture and views that surround them.

ON MANY LEVELS

In this case, my clients wanted multiple water effects that harmonized with the complex geometry of their home – a good starting place. The basic concept includes a black-and-white hardscape with subtle landscaping touches throughout – nothing overstated or gimmicky, just an elegant look that fits with the surroundings.

As completed, the design includes three bodies of water that interweave with the hardscape and architecture while taking advantage of the property's slope and the beauty of the surrounding Sonora Desert. It's all on multiple planes, moving the eye across the watershapes, planters, stairs, pathways and decks, across interweaving repeated shapes and effects – and always ending up in distant desert views.

Upper Crust

My design work began by accommodating two sculptures by abstract artist Otto Riggins, whose unique works now appear to float above gleaming black cubes of water.

The first composition sits on a 6-by-12-foot water pedestal – a 360-degree perimeter overflow vessel finished in black absolute granite. The sculpture is centrally positioned in the view through floor-to-ceiling windows that line up with the dining-room table inside.

The unusual concrete-and-glass sculpture floating atop the watery pedestal is a unique invitation to step outside and see more of the environment. Once outside, visitors can walk either to the right or left side of the pedestal to get to the rest of the yard, and because of the way it sits on the stairs, they enjoy multiple, close views of the unusual shapes as they go.

The second Riggins sculpture, seen in the background at the far edge of the yard, also sits on an overflowing black pedestal. In this way, an immediate visual link is created between near and far views with both fluid artwork and artful water.

Continued on page 32

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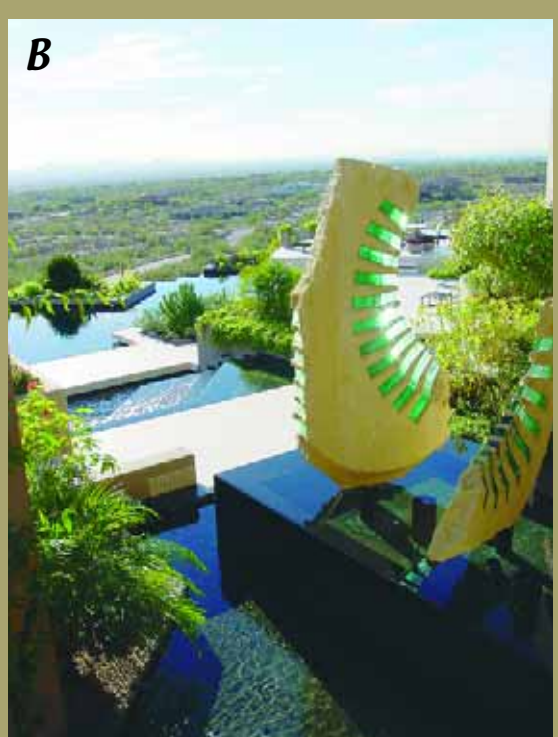

B

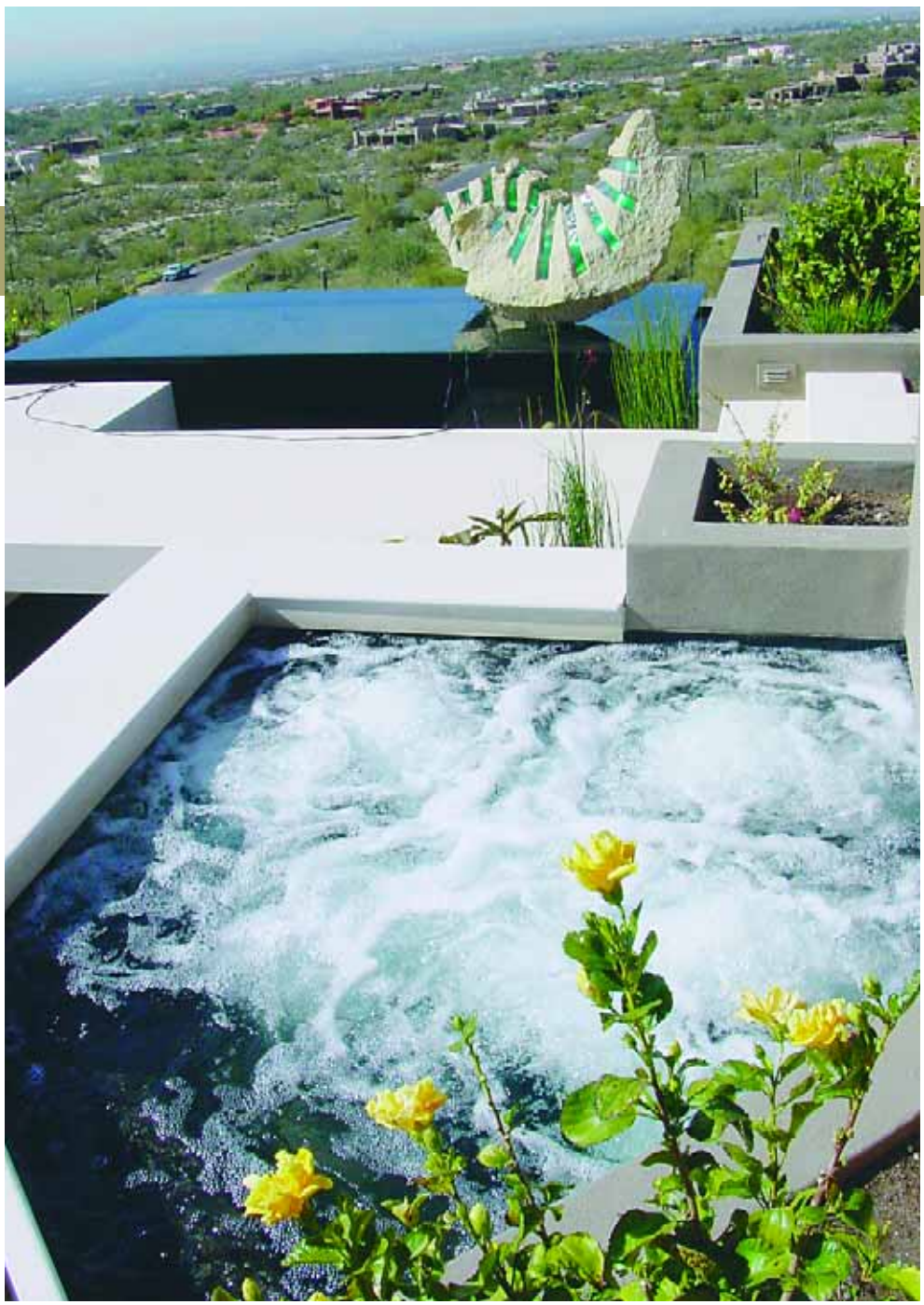
Elegant Cascades

The overflow from the upper pedestal feeds two cascades that fall next to stairways – then disappear and reappear under a walkway, all leading the viewer toward the swimming pool (A).

Directly in front of the pedestal is a broad stair-step cascade (B). In this case, the steps create reflective surfaces that visually link the surface of the pedestal with the surface of the swimming pool below. I like using these step cascades for a number of reasons, not the least of which is that they look like a series of small vanishing edges that lead the eye from one elevation and surface to the next.

To the right is a smaller stair-step cascade that follows the stairs that lead from the upper deck to the swimming pool area (C). The water appears and disappears beneath the decking, which is cantilevered slightly over this waterfeature. The effect makes it appear as though the water flows under the deck and into the pool; despite this visual link, however, the pedestal and cascades have a separate circulation system.

The earthen-colored plaster used on the planters was achieved by mixing mulch and soil directly into the plaster mix. This softened the blacks and whites and serves as a visual bridge to the desert environs and the numerous adobe-colored structures seen in the surrounding area.



Warm Water Views

As guests move toward the pool along the right side's step cascades, they head straight for the spa area. The steps leading to the spa are set at an angle to reflect the soft angles seen in the larger cascades. The spa itself has an irregular pentagonal shape – sort of a square with an off-set – and is nestled among planters and a large sundeck.

The spa is set just above the level of the pedestal for the second Riggins sculpture, seen here clearly with its perimeter-overflow pedestal of black absolute granite. Again, the idea is to pull the viewer's gaze into the distant views while visually recalling the sculpture and pedestal on the top level.

The spa originally had been placed on the upper deck, but in setting the elevations we saw that a much stronger vantage point would be found by lowering it to its current level.

Continued on page 36

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D


E

Cut Lines

The swimming pool sits at the heart of this tapestry of decks, steps, angles and reflective watery surfaces. It, too, is a crisp geometric figure – albeit an asymmetric, irregular one (D). The pool features a black pebble finish, several planters and cantilevered decking that covers the many spots where water appears or disappears from view.

Water from the lower pedestal flows in front of the spa and under steps on its way to the pool (E). Water also flows *from* the pool via two sets of vanishing edges (F). In both cases, the cascades are only a few feet wide – a departure from a lot of the sweeping edges built these days but that in this case echo the tight geometry and stairstep lines that appear throughout the design.

The vanishing edge on the left side of the pool eventually flows onto a series of stairstep cascades (G). This waterfeature was developed for the visual and aural benefit of those staying in a guesthouse located below and adjacent to the edge and its catch basin.

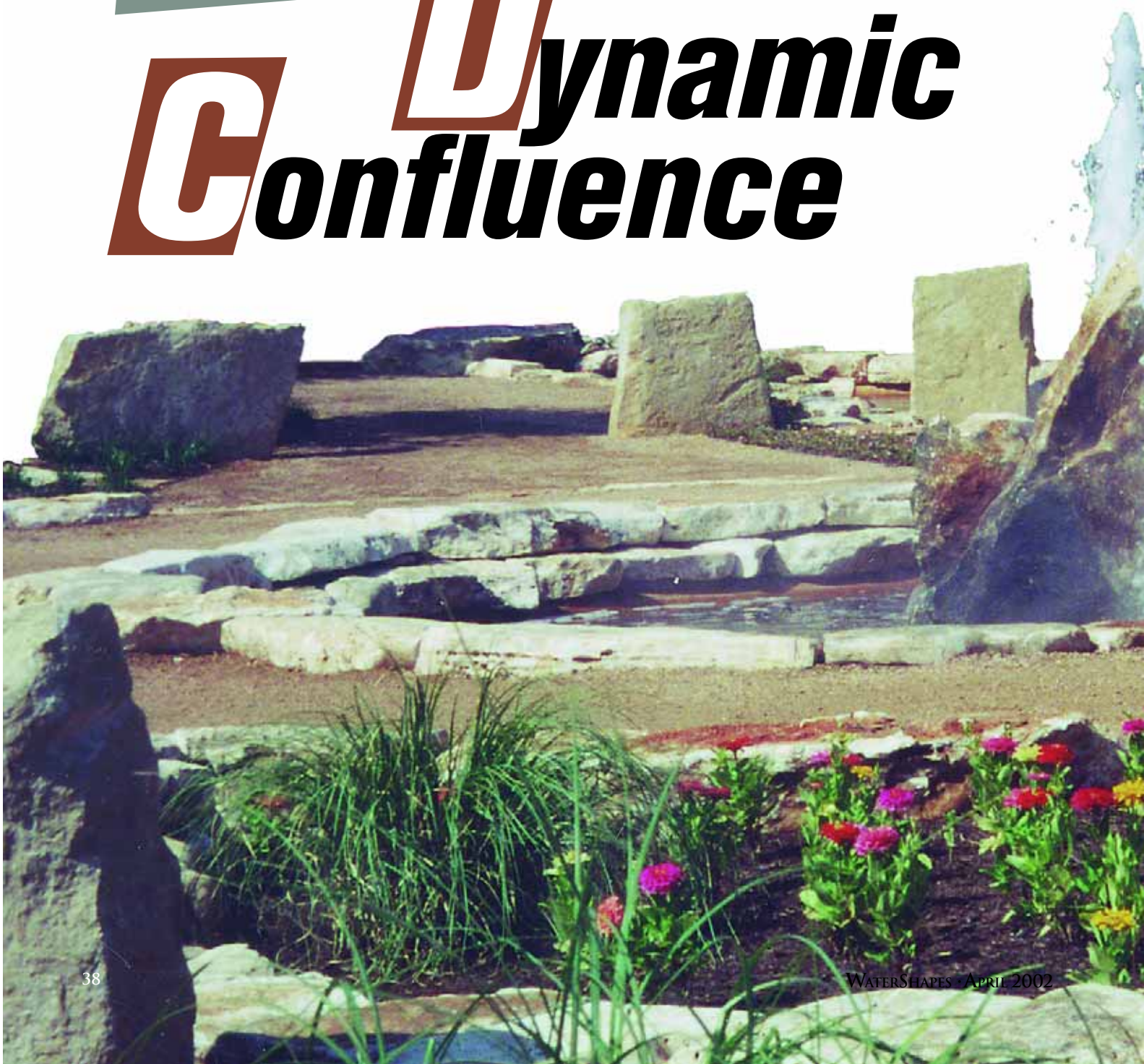

F


G

It isn't unusual for big fountain projects to present unique challenges to their designers, outfitters and installers – and the one seen here is no exception. But this uniquely sculpted project, with its rocks and boulders and state-of-the-art watershaping technology, was more satisfying than most to the staff at Roman Fountains and Jon Mitovich, who immersed themselves in the process of turning a landscape architect's drawings into a functioning marvel.

By Jon Mitovich

Dynamic Confluence



Perhaps the hardest thing for a watershaper to accomplish is to take a set of someone else's drawings, plans, sections and elevations, roll them all around together and come up with an accurate, three-dimensional, *living* interpretation of an architect's vision.

The project shown here is a prime example of what's involved in this process. Designed by senior landscape architect Patrick Smith of the Austin, Texas, firm of Richardson Verdoorn, the plans called for three separate streams ranging in length from 50 to 80 feet (with each dropping 36 inches over various weirs) – all converging on a rocky central basin in the plaza of an upscale Austin office complex.

In that central basin, an unusual set of water effects and a Stonehenge-like set of ornamental rock specimens (placed dramatically on edge) combine to create a distinctive point of interest at the heart of the property.

For all of us at Roman Fountains, an Albuquerque, N.M.-based designer and manufacturer of fountain systems, this project offered a unique showcase for our products at the same time as it gave us the opportunity to participate in the creation of something truly special. For all of us, the journey from ink and paper to rocks and streams was a challenging one that required collaboration, cooperation and highly professional execution of critical assignments by all project players.

Place-Making

The project began with the arrival of the rocks – some very *large* ones at that, including the 2-1/2-ton limestone slabs that form a curvilinear boulder wall as well as an array of other substantial boulders and rocks that would be placed around the site.

All of this stonework was under the management of Bill Wilmot of L&R Landscape Services. This firm is *the* local resource for setting up rock formations that echo landforms indigenous to the Austin area. Wilmot and his staff played the key role in selecting and arranging the material in pursuit of the original design. In fact, it was Wilmot who discovered the massive limestone slabs in the woods outside of Austin.

But this project was not just about huge pieces of stone. Balance and harmony are brought to the overall composition by the water and the way the meandering streams introduce soothing sounds and a variety of visual impressions as they flow toward the plaza's center.

And once the water reaches that core, the relaxing flow is transformed into a spectacle of sound, sensations and motion through a fog/mist system, a carefully conceived lighting system and special cascade-aerating nozzles that create white, frothy plumes of water rising between the basin's limestone monoliths.

Continued on page 25

From the Ground Up

After the streambeds and central collection basin were excavated, the suction sumps and nozzle water stops were roughed into place (A). Our molded-fiberglass intake sumps (with stainless steel "coin catcher" baskets and brass anti-vortex plates) provided suction points for the system's hydraulics.

The streams and basin were then fitted with a 45-mil EPDM liner (B) that was in turn covered by a 4-inch thick "road base" of compacted sub-grade material and, finally, a 9-inch-thick, rebar-reinforced concrete shell (C).

Continued on page 42

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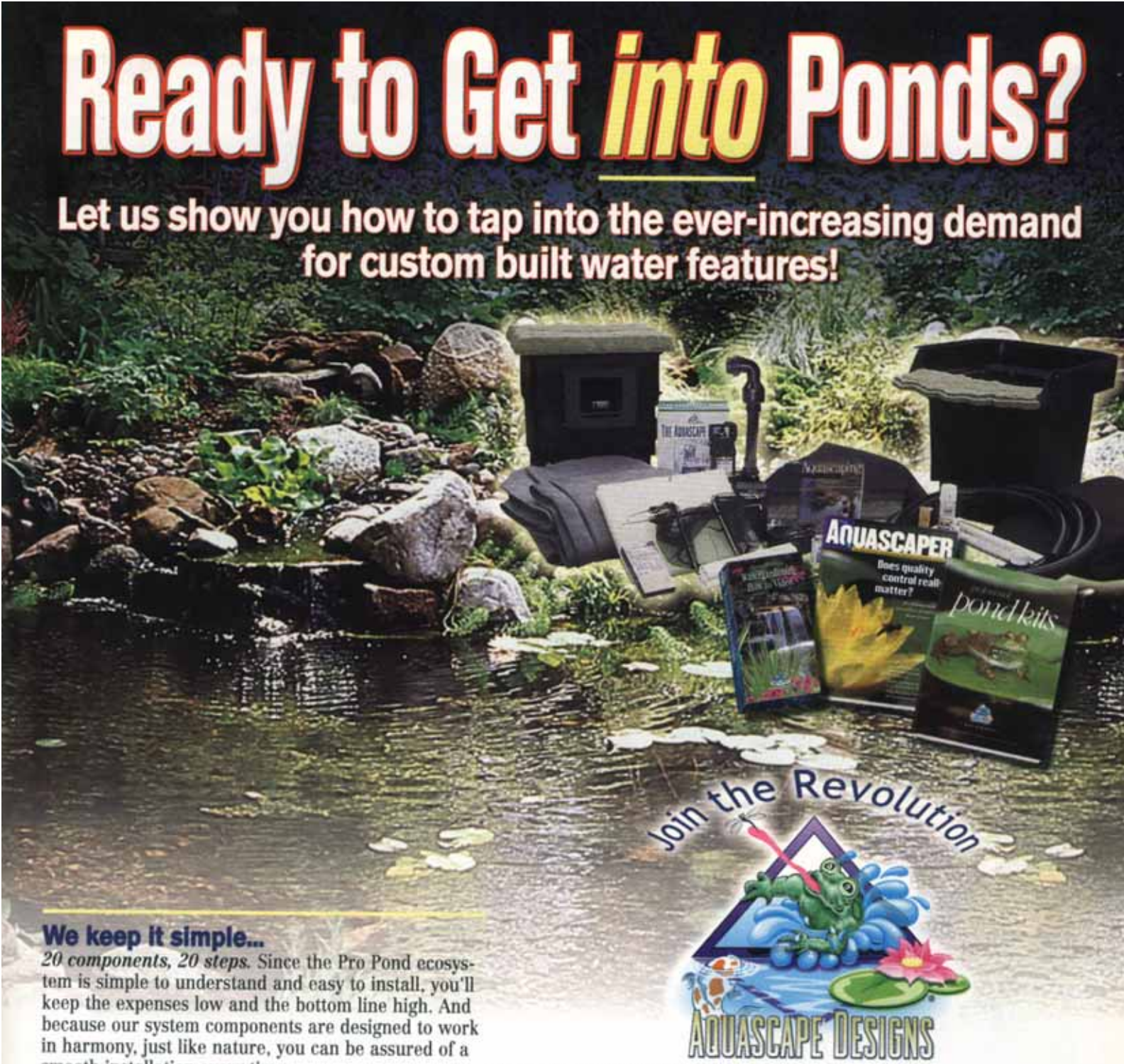

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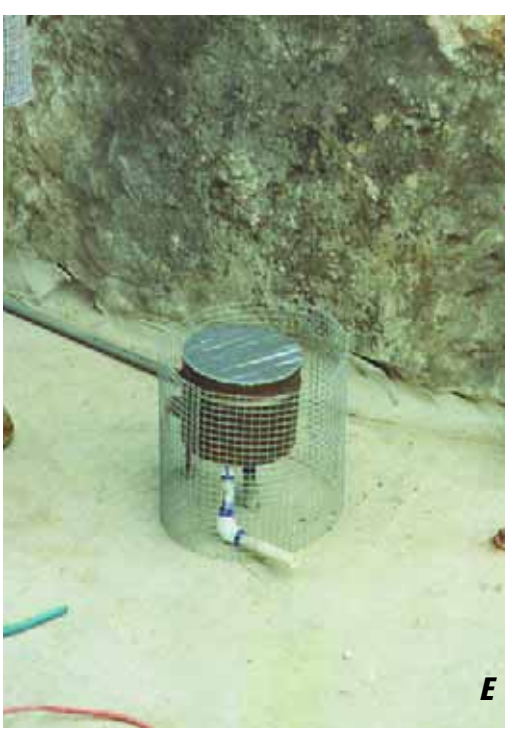
D



E

Basin Masons

With the central basin in place, Bill Wilmot and the staff at L&R Landscape Services placed the edging stones and mounted the large, upright boulders. The edging for the stream and basin is all buff- and cream-colored limestone. The vertical rock slabs in the center of the basin are Lueeder stone, an exceptionally beautiful and colorful limestone material excavated from a local quarry (D).

As this work proceeded, all concrete surfaces were acid stained and sealed with buff and cream colors to match the rest of the rockwork installed on site. At the same time, the small round lighting niches were formed (E) and poured, and the piping for the 12-nozzle fog/mist system was installed around the basin's perimeter (F). The fog is a visual bonus that has the added virtue of cooling the air around the central basin and making the area even more attractive to visitors.

The hardscape design also includes sitting stones that surround the feature's central basin (G) as well as a foot-deep layer of New Mexico river rock cobbles for the central basin and lower ends of the streambeds. The cobbles ultimately served to conceal fountain equipment, hardware and drains.


F


G

H

In the Vault

The hidden heart of the water system is our fiberglass-reinforced, direct-burial equipment vault. Approximately a six-foot cube, this vault is a factory-engineered, pre-tested system that contains the display pump, filtration pump and tank, water-treatment system and electrical controls (H).

The unit was installed below grade on an 8-inch-thick, reinforced-concrete slab, and Wilmot's crews made the factory-specified plumbing and electrical connections (I). (The fog system's equipment package was installed in a separate housing adjacent to the main vault.)

Pressure Testing

As with any watershaping project, avoiding leaks is critical to success.

In this case – with all that heavy rockwork being placed over and near the plumbing runs – it was particularly important to avoid having to go back and rework *any* of the plumbing. As a result, the entire plumbing system was painstakingly tested with pneumatic pressure before the stones were placed – and kept under pressure throughout the construction process.

– J.M.


J


K

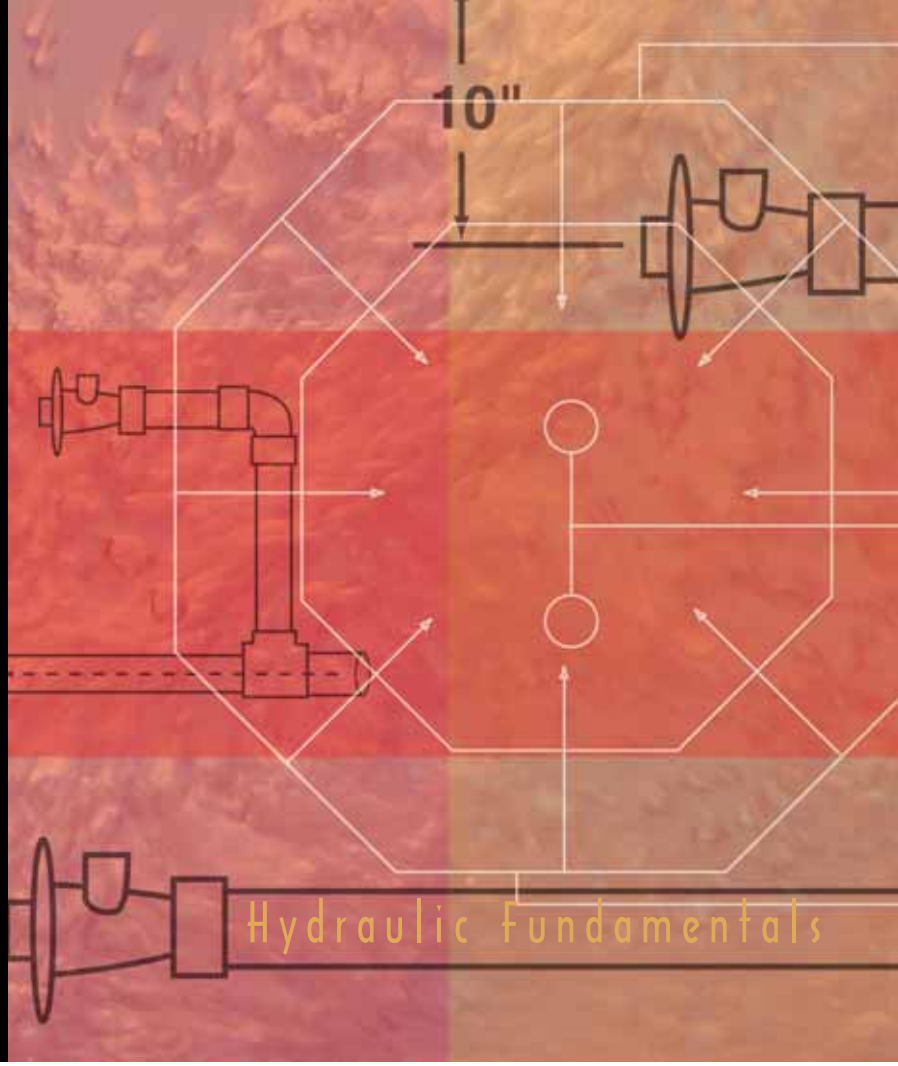
Rock Bottoms

The addition of New Mexico river rocks marked the near-completion of the central basin, which now contained the cascade nozzles, light fixtures, sump screens and overflow standpipe (J). The submersible niche lights, placed strategically around the perimeter of the central basin in small, raised concrete pylons, offer vivid nighttime illumination of the moving water elements and the fog effects.

Although this watershape is obviously man-made, the rough-hewn appearance of the massive boulders lends a natural touch to a distinctly sculptural setting (K). In operation, each stream delivers 100 gallons per minute to the central basin (L). Various stepping boulders and concrete bridges allow visitors to traverse the streams and enjoy views of the central basin from a variety of angles.

Primed and Ready

By Steve Gutai



It should be a given, but it isn't: Despite the fact that proper pump installation is critical to ensuring the reliable and efficient functioning of any watershape's circulation system, too often installers will take shortcuts that compromise performance and shorten a pump's life. In this article, hydraulics expert Steve Gutai opens a new series on proper hydraulics with a concise look at what it takes to get the installation done the right way.

Proper pump installation is critical to creating a balanced hydraulic system.

All it takes is your attention to just a few basic installation procedures and guidelines not only to lengthen the life of the pump and motor and conserve energy, but also to ensure proper performance of the watershape and proper functioning of its circulation system.

The pump/motor combination truly is the heart of the circulation system, and experience shows that observing the guidelines below will spell the difference between a system that generates consistent headaches – and one that purrs smoothly while providing years of reliable and efficient operation.

❑ **Set up proper valving.** Selecting and installing the right valves will do a great deal to lengthen the life of a pump. The main types of valves that relate to swimming pool pumps are ball or gate valves and check valves.

Ball and *gate valves* are typically used to isolate the pump within the system. When a pump is plumbed in a flooded-suction environment (that is, below water level), it is very important to be able to shut down the flow of water to the pump for ease of service.

In addition, a valve on the pump's discharge side can be used to throttle down water flow, if needed. This will allow you to adjust the pump's flow so that it's operating at its best efficiency point. (This is an adjustment service technicians often make to prevent cavitation.)

Check valves have a completely different purpose. They are plumbed on the suction side of the pump to hold water in the pump trap. This helps the priming process, while making it easier for the pump to lift water. In addition, plumbing a check valve on the discharge side of the pump takes the static water pressure off the pump casing when it is positioned below the water level or set in a flooded-suction environment.

❑ **Establish the right plumbing configuration.** Having the right plumbing layout is another important factor in easy priming. This means setting the pump up so there's a distance equivalent to four times the pipe diameter on the suction side of the pump – that is, if you are using 2-inch pipe, there should be a straight run of at least eight inches going into the pump without any kind of a turn (Figure 1).

Never plumb a 90-degree directly into the suction side of a pump (Figure 2): The additional resistance caused by the elbow will significantly restrict the flow of water into the pump.

❑ **Avoid air lock.** Air lock occurs when the plumbing on the suction side of the pump is elevated in relation to the eye of the pump's impeller. You'll see this when the plumbing is lifted higher in front of the pump than the level of the pump trap (Figure 3).

Plumbers often set things up this way so homeowners won't have to bend over to rotate valves into the spa mode, for example. In other instances, air locks will occur because of the uneven terrain through which the plumbing runs.

The two main symptoms of air lock are melted pump-trap baskets and melted nipples on the pump's discharge fitting. As the nipple shrinks, it compounds the problem of the air lock by allowing air into the system.

❑ **Use the right materials.** Plumbing the pump with CPVC or Schedule 80 threaded nipples on both the suction and discharge sides will reduce the chance of an air leak occurring. Because these materials are more durable (that is, the Schedule 80 nipple is thicker than one made with Schedule 40 PVC) or can take higher amounts of heat (that is, the CPVC is more heat-tolerant than Schedule 40 PVC), you lower the risk of the nipples breaking or melting down.

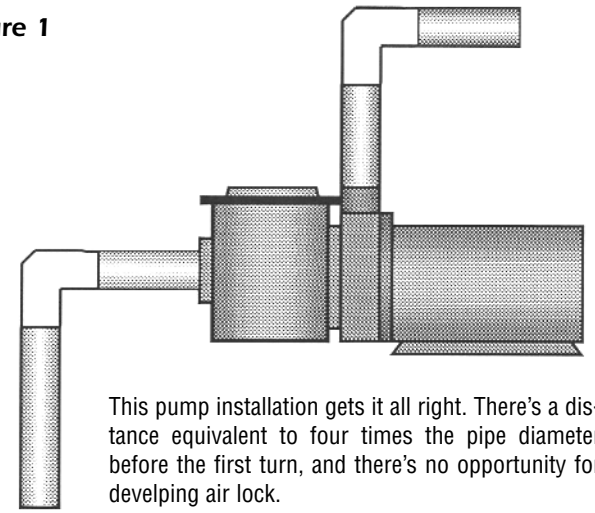
❑ **Take care with union fittings.** If you are using a pump that has union connections, be sure that the sealing surfaces of the unions are clean, that the O-ring is intact and properly seated in the groove, and that the plumbing is going straight into the pump.

In addition, when installing one of these pumps, it's good practice to attach the unions to the pump and plumb *away* from the pump, rather than plumbing *into* the pump. This ensures that both sides of the union will seat properly on the opposing surfaces.

❑ **Use your gauges.** After pump installation, use a pressure gauge to monitor friction losses on the discharge side and a vacuum gauge on the suction trap to determine those losses on the suction side. It's also wise to take an amp-draw reading and throttle down the valve on the discharge side, adjusting the draw to the specified level.

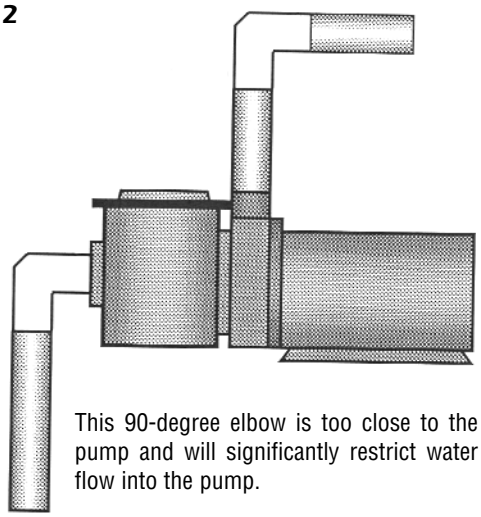
There isn't a lot to installing a pump properly, but it's surprising how often you find equipment pads that break all the rules. If you observe these six simple tips and make certain your plumber knows how things really should be done, the result will be pumps that run smoother, cost much less to operate and last a long time.

Figure 1



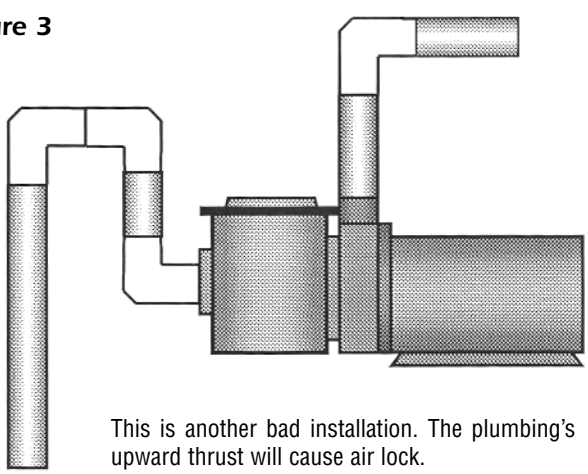
This pump installation gets it all right. There's a distance equivalent to four times the pipe diameter before the first turn, and there's no opportunity for develping air lock.

Figure 2



This 90-degree elbow is too close to the pump and will significantly restrict water flow into the pump.

Figure 3



This is another bad installation. The plumbing's upward thrust will cause air lock.

Creating natural-looking cascades and waterfalls requires the deft handling of a range of technical and aesthetic details – the chief of which, observes watershaper Bob Dews, is effective concealment of the water's source. Here, this specialist in ultra-natural watershapes for residential and commercial clients discusses strategies he uses to hide the headwaters and conjure some distinctly 'natural' impressions.

The Hidden Source

By Bob Dews

Cascades and waterfalls are different from most other types of watershapes. In ponds, for example, the quiet reflective surface of the water serves to accentuate elements within the water, such as the plants, fish and rock materials, while reflecting the features surrounding it. That same reflectivity is a hallmark of pools as well.

Our purpose in setting up cascades and waterfalls is, by contrast, to highlight the water itself, and specifically the beauty of water in motion. As it flows over and around rocks and descends through natural weirs and cascades, the water itself creates interest, excitement and soothing sounds.

There's also a greater sense of variety when you make the water move. Within relatively small spaces, we set water up to rush and meander, cascade and roll, tumble and trickle – all by way of conjuring impressions of a natural stream moving down a grade.

Using moving water in this way – in mimicry of nature – is a true watershaping specialty, and volumes could be written about what it takes to make these scenes believable. For now, however, let's focus on setting up headwaters – a feature we at Extreme Ponds in Cashiers, N.C., have come to see as the key to cascade credibility.

Beautiful Illusions

When you spend time with people near moving watershapes, you can tell right away whether or not the illusion is working. All too often, I find that the obvious presence of the water source tells the viewer that a waterfeature is artificial.

This is why I'm so pleased with our own projects when people ask if they're looking at a natural stream. I play it cool and don't let on how flattered I am that they would even ask the question, but inside I'm truly thrilled. After I confess that the

Figure 1

work is artificial, what happens almost invariably is that the observers look more closely.

As I watch their eyes moving up, down and across our work, I eagerly await what is almost always the next question: "Where does all the water come from?" That's the moment I know that we have succeeded in creating a believable natural watershape.

I'm proud of what I do and know that many techniques I've meticulously applied in assembling the components of any given cascade from top to bottom have gone into making this overall impression, but I also know that there's a small visual trick that's crucial to my success: There are many things you can do to create a natural-looking waterfeature, but none is as important as hiding the point at which the water enters the system!

Doing this successfully requires planning from the outset of the project and requires an answer to what might seem like a dumb question: Do you want the waterfeature to appear artificial, or are you trying to make it look natural? The answer to that basic question influences every aspect of the design in aesthetic terms as well as on a variety of technical levels, including the physical layout.

To appreciate this point, consider the way most fountain designers would answer the question. They know the viewer will understand that the fountain is artificial, so the designer *highlights* the entry point of the water by making it spray, splash or squirt. But if you're building a natural watershape, what you want instead is to make the water's entry point as subtle as possible in order to highlight the naturalistic features of the design.

Water rarely emerges from a discernable source in nature, so emulating nature means mastering the art of *concealment*. That seems an obvious-enough point, but it's overlooked all too often – much to the detriment of otherwise beautiful work.

Far too often, what you find is a dump-truck-size load of dirt mounded up with water spewing out of a PVC pipe or over a straight weir set and displayed as though the installer actually wanted to call attention to it. Water then travels straight down from the top of the mound along what can best be described as a drainage ditch before reaching the base pond. It's the dreaded "volcano effect."

Suddenly, an otherwise well-crafted body of water has taken on a new look, and it isn't very appealing!

Inklings of Doubt

When the design completely eliminates a clear sense of the water's source, wonderful things happen. Basically, this bit of concealment keeps the mind's eye from drawing quick conclusions about whether or not a water system is man-made.

What you've done as a designer in this case is create an illusion and impose an element of doubt in the eye of the beholder. It may be temporary, because even the best artificial systems will reveal their true nature under close scrutiny, but the longer you can draw out the illusion, the better – and the easier it will be for observers to ignore the fact that they're look-

ing at something man-made.

This is why it's important to pay just as much attention to the headwaters as you do to the base waters. Even if you merely conceal the source with rock material (a simple solution I see from time to time), it still takes the viewer a valuable moment to figure things out – better than nothing, although I'd say not the best of solutions.

The fact of the matter is that concealing headwaters isn't that difficult, especially when you plan for it from the outset of a project. The easiest approach is simply to hide the point of origin by separating the view of the origination point from the view of the base water. In other words, when looking at the entire watershape from the principle vantage point, you should not be able to take in the starting point and the ending point in one view: It kills the illusion.

Instead, if you move the point at which water enters the system out of the range of view from the base water, you create doubt in the mind and preserve the illusion. This can be achieved quite easily by "bending" the flow – something as simple as winding the cascade around a bush (Figure 1) or as elaborate as starting your watercourse around the corner of a building. In one case, I concealed my source beneath a wooden porch (Figure 2).

Often, however, this sort of geographical misdirection isn't an option and you'll need to use some other form of concealment. If the system contains fish, for example, off-the-shelf biological filters can be used in a couple of useful ways. First, they give you an area for colonizing bacteria that are essential in the nitrate cycle and crucial to the health of any living system. Second, biofilters provide a concealable point of entry for water into your watershapes.

Helpfully, some suppliers have added synthetic waterfall stones to their biofilter units to help create that first cascade of water and offset the undesirable effect of water spilling over a straight weir. These

Water rarely emerges from a discernable source in nature, so emulating nature means mastering the art of *concealment*. That seems an obvious-enough point, but it's overlooked all too often – much to the detriment of otherwise beautiful work.

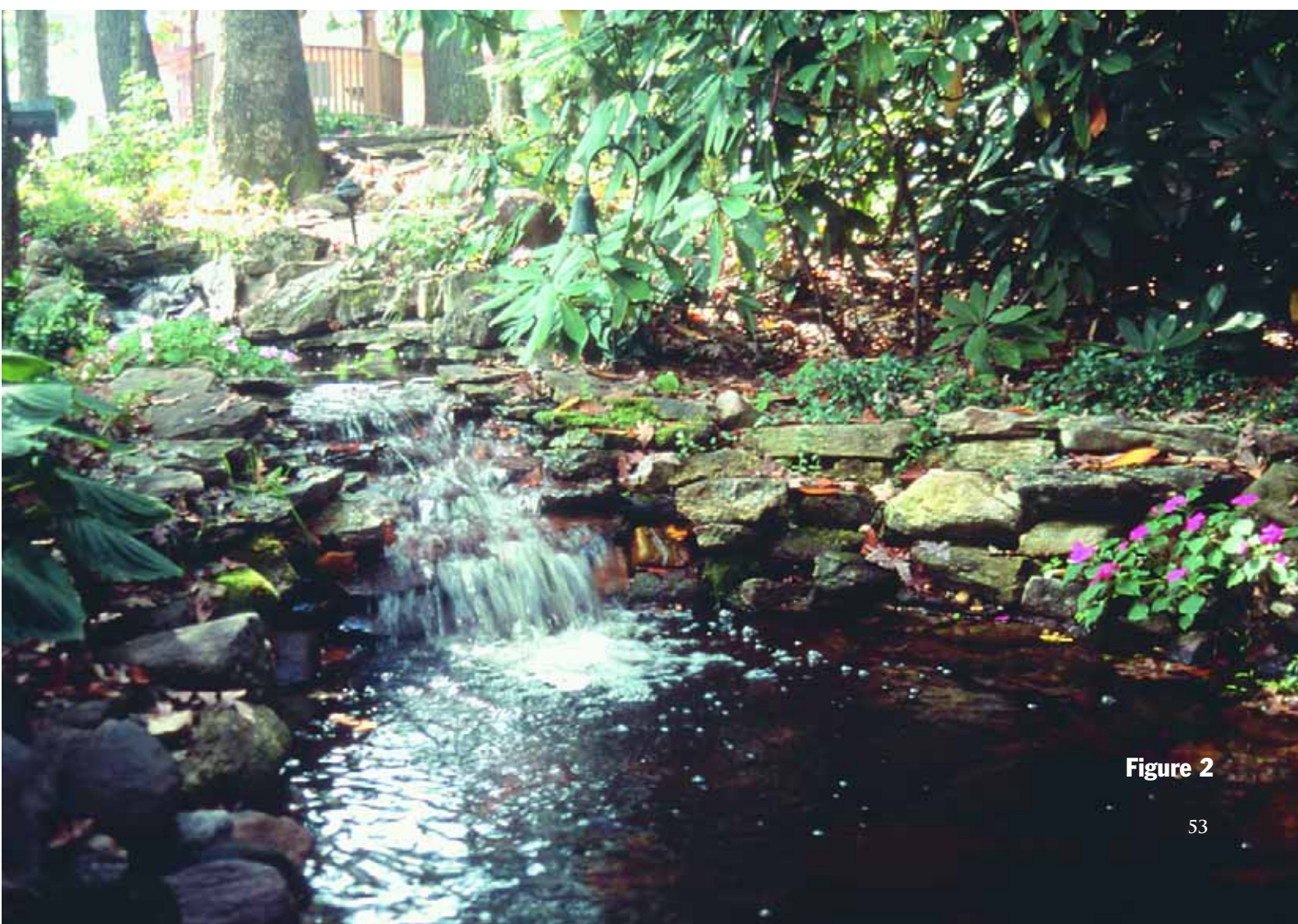


Figure 2

boxes serve their primary function well and can also be made to work aesthetically (Figure 3).

Sometimes I'll conceal a pre-fabricated biofilter by breaking up the initial flow pattern using complex cascades directly in front of its weir (Figure 4). I also "naturalize" the area surrounding the point of origin by introducing a variety of plant, rock and wood material and making sure to provide natural visual backdrops above and behind the water source (Figure 5).

Up from a Bog

An even better option from an aesthetic standpoint involves building a custom biofilter in the form of a natural-looking bog – or a "bog garden" as we call it at my company. When done correctly, this design creates an uncannily subtle entry point – the impression of a spring welling up from the ground.

Bog gardens can be sized to fit the filtering and aesthetic needs for any feature, and they are not difficult to build or fit within a design. Better yet, they give you the opportunity to include a variety of marsh-type plants that will thrive in a boggy environment – a perfect blend of form (by hiding your headwaters) and function (by acting as a vacuum cleaner in removing nutrients from the water).

In other words, custom bog gardens offer huge returns in terms of aesthetics and the all-important natural illusion – and the fact that they're easy to set up makes it easy to include them. All that's required is setting up a flat-bottomed pond at the head of the watercourse about five to eight inches in depth (Figure 6).

Just set up a bulkhead fitting to bring the water from the pump in through the side of the liner at the bottom of the bog garden, then put together a manifold system with PVC pipe to distribute the water flow equally across the bottom of the pond (Figure 7).

We usually drill 3/4-inch holes in the manifold system so that any debris sucked through the pump will also pass through and not clog the system. We also cover the manifold system with two or three inches of rough-textured gravel to establish a stronghold for nitrifying bacteria.

In addition, we often use dirt to create


Figure 3


Figure 6


Figure 4


Figure 5


Figure 7

Custom bog gardens offer huge returns in terms of aesthetics and the all-important natural illusion.

the walls of the bog garden instead of rock – another naturalistic touch. To do this, we create a depression in the gravel around the perimeter of the bog garden and line it with underlayment fabric. This holds the dirt bank together and keeps it from settling to the bottom of the bog (Figure 8). Next, we add dirt to form a gradual slope out of the bog garden and into the surrounding landscape – bearing in mind, of course, that we need to keep the overall pond liner's edge above water level.

With or without fish, a bog garden is a great way to start a waterfeature and keep the water healthy and clean at the same time – not to mention, the planting possibilities are endless. Water wells up from the bottom of the bog and spills over a lowered edge and onto cascades that diffuse the flow and guide it to the lower portions of the installation (Figure 9).

Weeping Walls

If introducing the water through a bog garden is not an option because of space or slope factors and there's no practical way to take the entry point of the water out of view of the rest of the feature, a weeping wall is always an option. The concept is to take the originating volume of water and distribute it over a horizontal area where it flows slowly over an expanse of carefully placed rocks.

The longer the horizontal run, the more the volume of water is split. Thus, the water flow can be tailored to create an originating effect that complements the rest of the watershape without overwhelming it.

To create a weeping-wall effect, take the water-entry pipe and create a horizontal manifold system, again taking care to level the system so it distributes the water evenly (Figure 10). Stack a rock wall in front of the manifold system, foaming any


Figure 8


Figure 9


Figure 10

voids where you don't want the water to flow and thereby forcing it over the front of the rock wall (Figure 11). Remember, the longer the manifold run, the more of a trickle effect you'll create.

The weeping wall is yet another way of creating a grand illusion that water is finding its way from underground, through native rocks and soils and into your system (Figure 12). Personally, I like this design because of the wide variety of cascades it lets me establish and the capability it has to capture observers' attention with delicate, intricate flows.

Absolutely, there are more ways than these to introduce water into watershapes. No matter what those other options are, the basic principles should always be the same: *Try to break up or hide the water's source.* However you decide to tackle the overall design challenge, paying proper attention to the headwaters is critical – a detail that, sooner or later, everyone will take time to notice.


Figure 11


Figure 12

Product Information Card

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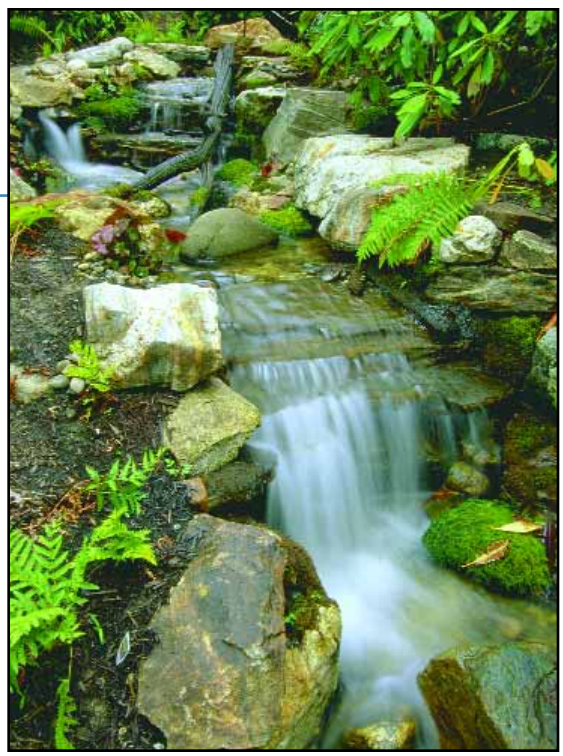
GENESIS 3 A DESIGN GROUP

How Good Do You Want To Be?

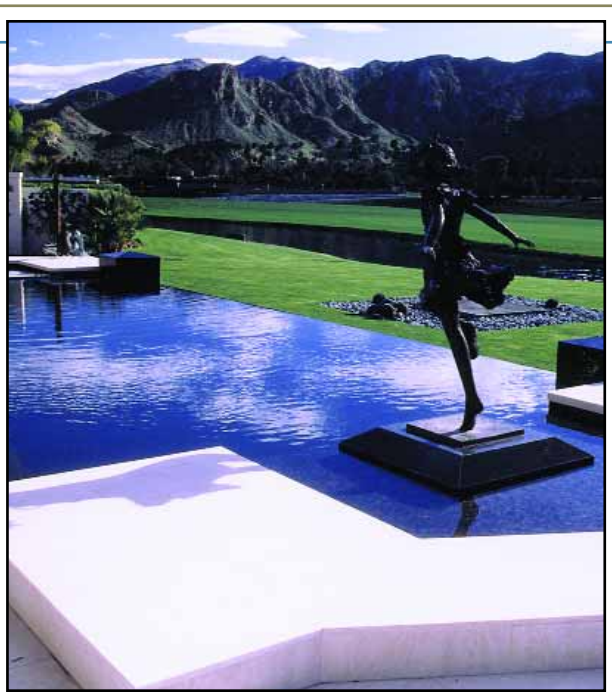
Genesis 3 Schedule, Fall 2002

This fall, David Tisherman, Skip Phillips and Brian Van Bower are hosting two very special Genesis 3 events: The group's first-ever Pond School and the latest in the series of increasingly popular Level I Schools.



October 3-6, 2002
Miami, Florida
Genesis Pond School

An in-depth exploration of the art and science of pond design, this program begins with an inspirational look at history by renowned designer Anthony Archer-Wills before moving on to discussions of practical issues of ecosystem management, biological filtration, concrete vs. vinyl lining and more. Open to all applicants, the course also features presentations on plants, water quality and the care and feeding of fish.



November 6-10, 2002
Morro Bay, California
Genesis Level I School

The flagship school in the Genesis 3 program, this school focuses on design, engineering and construction of watershapes, drawing techniques and the Genesis 3 philosophy. Open to all applicants, this is the access point to advanced Genesis Family programs and demonstrates what it takes to operate at the highest level of expertise – including up-close and personal familiarity with the lifestyles of high-end clients.

For more information, contact the Genesis 3 office, toll-free, at (877) 513-5800 — or visit our website: www.genesis3.com

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DECKING AND COPING CATALOG

Circle 100 on Reader Service Card

STEGMEIER CORP. has published its 2002 Catalog of construction forms for use in setting up coping and deck systems for gunite and vinyl-lined pools. The 66-page booklet covers forms for use in creating details such as cantilevers and fiberoptic tracks as well as systems for deck drains, expansion and control joints and more. A special gatefold at the end of the catalog lays out all of the profiles. **Stegmeier Corp.**, Arlington, TX.

RESIDENTIAL/LIGHT-COMMERCIAL POOL HEATERS

Circle101 on Reader Service Card

LOCHINVAR offers five models in the EnergyRite^2 line of pool/spa heaters. Designed for residential or light-commercial installations, the heaters range between 150,000 and 399,999 Btu/hr with 88% thermal efficiency ratings and multiple venting options. Each features a sealed combustion chamber for precise mixing of air and fuel and reduced potential for flame rollout or pest infestation. **Lochinvar**, Lebanon, TN.

WATER-LEVELING DEVICE

Circle 102 on Reader Service Card

POOLMISER has introduced The Smartmiser, a radio-controlled water-leveling device that senses when a watershape's water is low and sends a radio signal to a controller that automatically replenishes the vessel to the right level. Easy to install, the wireless unit fits in a skimmer and may be retrofitted into any system. It also includes an automatic shut-off switch to prevent flooding. **Poolmiser**, Petaluma, CA.

CHLORINE-GENERATING SYSTEMS

Circle 103 on Reader Service Card

ECO-MATIC offers an alternative to the use of packaged chlorine through an electrolytic process that converts common salt into sanitizing chlorine. The system controller is connected to the same power source as the pool pump and regulates the electrolytic cell to keep the water safe, crystal clear and free of any bacteria, viruses or algae – without any residues or unwanted by-products. **Eco-Matic**, Newport Beach, CA.

Water Treadmills

Circle 104 on Reader Service Card

SPECK PUMPS offers the Badu-Jet and Badu-Stream treadmill systems for pools and spas. Capable of creating currents in excess of 5,000 gpm, the jets are adjusted with controls mounted on the face of the jet housings to provide resistance for a therapeutic walk, jog or swim – long-distance workouts with no turning around. Also, a hose can be attached to a jet nozzle to create a massage effect. **Speck Pumps**, Jacksonville, FL.

Tubular Slides

Circle105 on Reader Service Card

MORNING STAR MFG. makes slides for installation in projects from backyard swimming pools to huge waterparks. The company offers consulting services that include planning, feasibility studies, 3-D custom design – the full range from concept to completion. Professional installation crews work on slides, interactive play systems, fountains and equipment enclosures and do all steel work in-house. **Morning Star Mfg.**, Crump, TN.

Plate Compactors

Circle 106 on Reader Service Card

VIBCO/HEINRICH offers reversible plate compactors for compacting the soil in ditches, foundations and other tight spots. The reversing unit lets the operator shift instantly from full forward to full reverse. The shock-mounted handle transfers less vibration to the operator, and the available 12- and 18-inch models feature self-cleaning base plates with rounded sides to avoid digdown. **Vibco/Heinrich**, Wyoming, RI.

Deck Drains

Circle 107 on Reader Service Card

QUAKER PLASTIC offers Deck Drain-A-Way System II. Made from tough, non-corrosive PVC, the durable components can be set in open areas or against walls and maintain a like-new appearance for years. The system adapts to all standard 1-1/2-inch fittings. No deep trenches are required for the 3-1/2-inch-high drains, and their slots create a neat, trim and unobtrusive appearance. **Quaker Plastic**, Mountville, PA.

RUSTIC-LOOK RETAINING WALLS

Circle 108 on Reader Service Card

ROCKWOOD RETAINING WALLS offers Cottage Stone, a system of lightweight, interlocking blocks that establish automatic setbacks and perfect alignments. Made of high-strength, low-absorption concrete, the rustic-look blocks come in a variety of earth-tone colors and are designed for use in terraced gardens, tree rings or retaining walls as high as 2-1/2 feet. **Rockwood Retaining Walls**, Rochester, MN.

PEBBLED CLEANING-HEAD CAPS

Circle 109 on Reader Service Card

CARETAKER SYSTEMS offers cleaning-head caps designed to make the pop-up heads disappear into the background of pebbled watershape surfaces. A printed, full-color image of the pebble surface is attached to the cap; the color is part of the plastic itself to ensure stability and durability. The caps can be retrofitted to existing Caretaker-equipped pools and come in a wide range of colors. **Caretaker Systems**, Scottsdale, AZ.

DECK-STAMPING SYSTEM

Circle 110 on Reader Service Card

MORTEX MFG. CO. has introduced Systex Stamp, a product that enables contractors to add stamped patterns and new colors to existing concrete decks and walkways. Featuring virtually limitless color and pattern possibilities, the three-step system includes a bonding agent, the stamp material and a clear sealer coat and adheres to clean, sound concrete substrates for a fresh, custom look. **Mortex Mfg. Co.**, Tucson, AZ.

CERAMIC TILE

Circle 111 on Reader Service Card

VIDREPUR OF AMERICA offers ceramic tile designed to withstand the tough conditions to which tile is exposed in watershapes, from continuous contact with water, freeze/thaw cycles and physical or chemical challenges to UV exposure and frequent cleaning with caustic products. Available patterns include everything from multi-colored mosaics and chessboards to custom images and more. **Vidrepur of America**, Miami, FL.

Pond Equipment and Services

Circle 112 on Reader Service Card

ADVANCED AQUACULTURE SYSTEMS specializes in the design of pond and waterfeature systems. Since 1984, the company has developed many propriety products and designs, including maintenance-free Aquacubes and Perma-Bead media as well as hundreds of other dependable components. The company also offers design and technical-support services for all projects. **Advanced Aquaculture Systems**, Brandon, FL.

Telescoping Fountains

Circle 113 on Reader Service Card

FOUNTAINS FOR POOLS manufactures Aquascope, a telescoping fountain that comes in four fountain patterns and transforms pools and spas into fountains during non-swimming hours. Easily installed at depths from 8 to 108 inches, the fountains retract flush into the pool or spa bottom and do not protrude when not in use. The fountain is powered by the pool's pump, so no additional pump is needed. **Fountains for Pools,** Tarzana, CA.

Of Interest

Digital Lighting Systems

Circle 114 on Reader Service Card

COLOR KINETICS has published a brochure on its ColorScape lighting systems for inground pools. Using the company's Chromacore technology, the lights use a microprocessor to mix red, green and blue LEDs to produce a wide array of colors and color effects. The brochure highlights ease of installation, long life, low maintenance and low power consumption as well as brilliant color. **Color Kinetics**, Boston, MA.

Modular Diatomaceous-Earth Filter

Circle 115 on Reader Service Card

STA-RITE has introduced the System 3 Mod DE Filter. The system marries the company's balanced-flow technology with well-established diatomaceous-earth filter technology to deliver superior water clarity. The new DE modules, available in 60- and 72-square-foot configurations, fit within the popular System 3 tank. In addition, the filter is bachwashable, so it can be used with or without valves. **Sta-Rite**, Delavan, WI.

Pool-Enclosure Dehumidifiers

Circle 116 on Reader Service Card

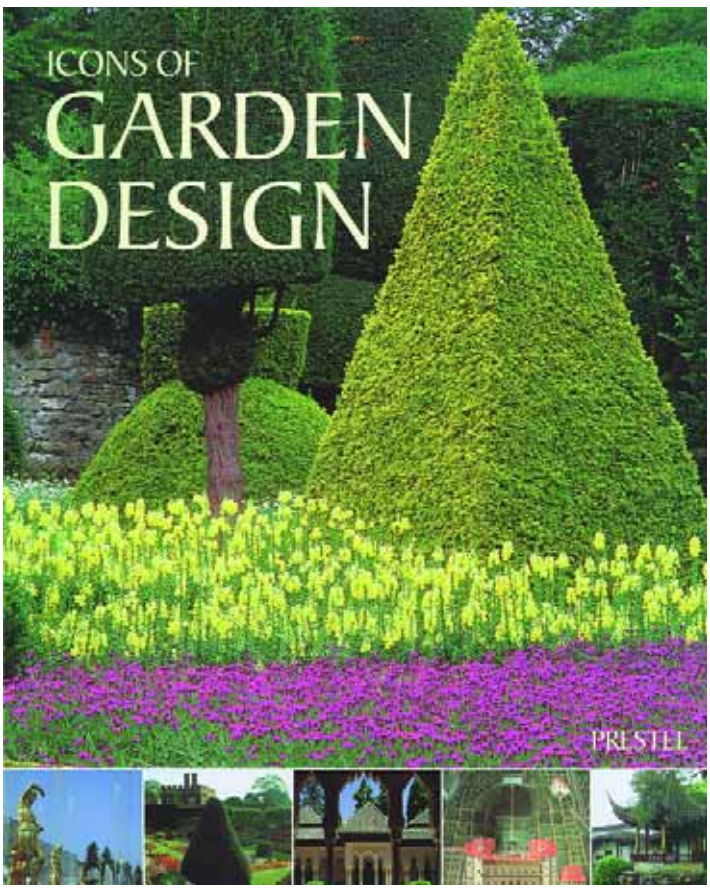
EBAC INDUSTRIAL PRODUCTS offers dehumidifier units that dry the air in interior spaces made damp by the presence of a swimming pool, spa, swim spa or other indoor water-feature. Units remove condensation from windows, walls and ceilings and draw off stuffy air for replacement with dry air. Quiet and self-contained units mount easily and feature simple controls. **Ebac Industrial Products**, Newport News, VA.

Pool Heat Pump

Circle 117 on Reader Service Card

PENTAIR POOL PRODUCTS has introduced MiniMax Plus HP, a heat pump that uses R410-A refrigerant in transferring ambient heat to pool water. The environmentally friendly system uses up to 80% less energy compared to conventional heaters and features dual thermostats for pool/spa combinations as well as a self-diagnosing control unit for dependable operation. **Pentair Pool Products**, Sanford, NC.

BY MIKE FARLEY



A Gallery of Icons

If you're looking for a broad overview of the world's most significant gardens, their styles and the designers who created them, *Icons of Garden Design* may well be just the book for you. The 174-page text, edited by Caroline Holmes and published by Prespel Publishing in 2001, consists of dozens of well-illustrated articles from a variety of writers who cover an amazingly broad range of famous designs and designers.

The book's coverage reaches back to 300 B.C. and comes to a close in the present. Along the way, you visit the grounds of Versailles in France, Chatsworth in England, the Peterhof in Russia and an array of gardens less well known to most of us educated in the Western world, including fantastic spaces in Japan, China, Turkey and Central Asia.

The range covered here is impressive, to say the least. There are descriptions of extremely formal designs, including the Alhambra in Spain, as well as examinations of the works of stylishly informal designers such as Gertrude Jekyll, the renowned English designer whose name has become synonymous with cottage gardens.

The oldest place under discussion is Sigiryia, an elaborate set of pavilions, pools and gardens built in Sri Lanka nearly 2,300 years ago, and the text examines some of the key achievements in the long history of Japanese gardening, including the Byodo-in, one of the few remaining examples of the 11th-century Heian style that featured space-hungry lakes and islands. There's also an account of the creation and history of the hypnotically beautiful Taj Mahal.

Some spaces are observed through time. We see, for example, the evolution of the famous Stowe garden in England, where legendary designers such as William Kent and Capability Brown worked in different styles at different times through the years. There are also interesting and enlightening accounts of the lengthy development of the grounds of Thomas Jefferson's Monticello – and, at the other end of the spectrum, an examination of the harried birth of Frank Lloyd Wright's Fallingwater.

As mentioned above, this little volume carries us up to the present and to *avant garde* designs by Mexico's Luis Barragan and Scotland's Ian Finley, both of whom have been extremely influential on modern design – but in distinctly different ways. The text also visits U.S. gardens by masters such as Daniel Kelley, who designed the famous Miller Garden in Columbus, Ind., and is considered the father of modernism in American landscape architecture. There are descriptions of the residential creations of Thomas Church and many others as well.

Although the book covers the broadest conceivable range of designs, the text does an admirable job of tracing the evolution of styles and of pointing out key influences and connections among many of our greatest architects and builders. But it's not just a history lesson: The book is filled with a huge number of design ideas ready for translation to new projects. And throughout, there are terrific examples of the use of water, from lakes and ponds to fountains and swimming pools.

Yes, it's a fast-paced tour, and for greater detail you'll need to look elsewhere. In that respect, the book helpfully includes an extensive list of references you can dig into for more information. Personally, I found a long list of books I'll be picking up in the near future – and I know you'll do the same. 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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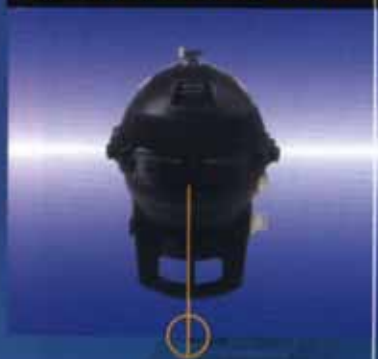

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