

Inside: Brian Van Bower on Teamwork

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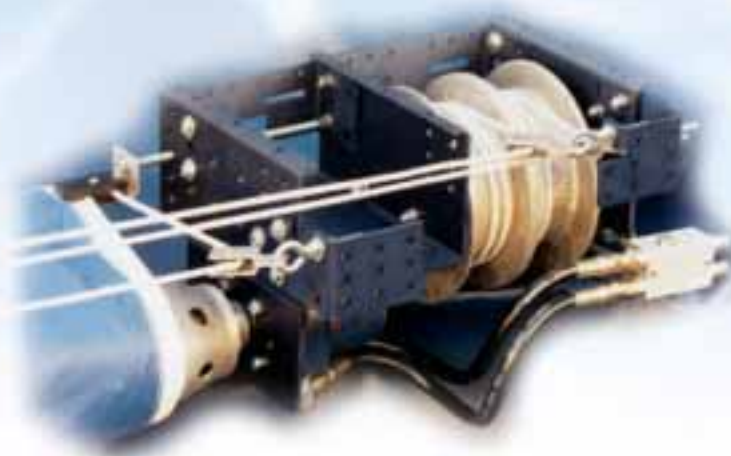
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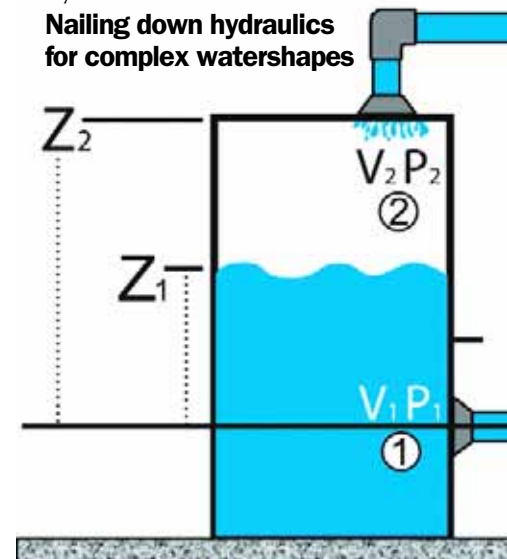




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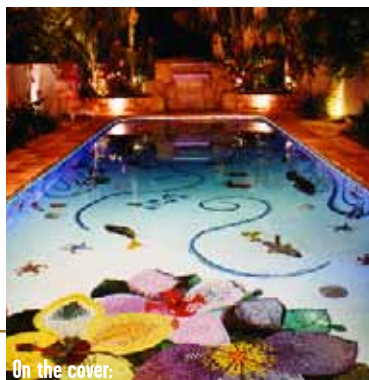
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On the cover:

Photo by Kathleen Persoff, Studio City, Calif., courtesy New Leaf Landscape, Agoura Hills, Calif.

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Personalities Plus

One of the most fascinating aspects of watershaping is the broad array of personalities that define the industry. From my perspective, getting to know those who contribute to these pages is a process of discovery that makes preparing every issue a private joy that is always publicly reflected in the magazine.

For those of you who pay attention to the cast of characters whose work and thoughts are represented here, you're probably most familiar with Brian Van Bower, Stephanie Rose, David Tisherman and Mike Farley – columnists who, issue after issue, share their insights and philosophies with all comers.

But through the years, there have been scores of other characters who have participated in this forum, and we take pride in the fact that each and every article in every single issue conveys information about the watershapers whose work we feature along with glimpses into the hearts and minds of their clients as well. Perceiving this "personality factor" is critical to understanding watershaping as an art form because, like most creative pursuits, the personal creative sparks between artist and client tend to result in the most distinctive projects.

We can see this in the most famous of watershapes: Consider, for example, how the pools at Hearst Castle reflected the personalities of both William Randolph Hearst and architect Julia Morgan, or the way the Playboy Mansion's pool directly expresses both Hugh Hefner's lifestyle and the design sensibilities of Ron and Suzanne Dirsmit. As beautiful as those works are given their own visual merits, the thing that makes them so fascinating is the way they reflect the personalities of those involved in creating them.

That same principle applies to works that are not so well known, even though those projects can provide even stronger reflections of personality. Indeed, watershaping is one of those endeavors that require a certain symbiosis of personalities between watershaper and client – a note we've sounded countless times through the years.

This issue features a project that stands as one of the most vivid and unusual expressions of personality and creative collaboration we've ever published. On page 56, first-time *WaterShapes* contributor Colleen Holmes describes a project she recently completed for a client who was obsessed with color, variety and whimsical humor – so much so that the whole affair defies categorization in terms of style or any familiar design sensibility.

It's a project that could only happen when artist and client develop a creative rapport and a project-specific design vocabulary. In describing this collaboration, Holmes walks us through a remarkable tour of the ways a client's personality can be expressed, magnified and celebrated using water, stone, light, textiles and garden ornamentation. It's fearless stuff – and a bit giddy as well.

Although this basic principle of watershaper/client collaboration is expressed in subtler forms in the vast majority of articles we publish, this feature provides particularly keen insight into that process. It shows watershaping as being about something more than the sum of its parts and explores the point at which it becomes an art form that can tell us a lot about ourselves.



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Juan Roca is a watershape designer and installer based in Guanacaste, Costa Rica, and founder and principal of Aquart, the country's only custom watershaping firm. Born in Barcelona, Spain, he holds a degree in industrial engineering and began his career in swimming pool construction in 1975 in San Jose, Costa Rica's capital. Roca's search for watershape-design education led him a few years back to the Genesis 3 Design Group, which he credits with transforming his approach to design and construction and led him to reconstitute his company with its current name in 2003 with a new focus on high-

end custom work. He can be reached through his web site, www.aquart.net.

Karl Nettmann, a 12-year veteran of the film industry, a licensed pyrotechnician and a manufacturer of high explosives, is an artist and sculptor who has worked on such films as *Scream 2*, *Men in Black*, *The Truman Show* and, most recently, *Underworld 2: Evolution*. His focus has recently shifted to fire-oriented metal artwork for landscape and interior settings, an interest that began as a hobby and has since expanded into a business. Using his expertise in special effects, Nettmann incorporates the ele-

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ments of fire and water into his designs, manipulating them into balanced and beautiful compositions. His works are now on display in homes and businesses around the country and at www.waterfirelight.com.

Steve Gutai is product manager for pumps, filters and valves with Jandy/Laars Products, a division of WaterPik Technologies of Petaluma, Calif. Gutai is a veteran of the swimming pool industry, having spent more than 13 years as an independent service and repair technician and subcontractor in the Los Angeles area. He spent three more years as a technical service manager and outside sales representative for Waterway Plastics in Oxnard, Calif. Gutai joined Laars & Jandy in 2000 and now works directly with contractors and engineers in designing circulation systems for pools, spas and other watershapes. He teaches hydraulics at trade shows throughout the United States and is the featured hydraulics instructor for Genesis 3's Level 1 schools.

Colleen Holmes is president of New Leaf Landscape, a full-service landscape design/construction firm based in Agoura Hills, Calif. A landscape designer with more than 30 years' experience, she began her career as a child at the side of her father, Charles Prowse, who instilled in her a love of the art of landscape design. She studied landscape architecture at the College of the Desert in Palm Desert, Calif., where she was profoundly influenced by sculptor/landscape artist Michael Watling, and later attended UCLA's school of landscape architecture. Her early work focused on designs for country clubs and gat-

ed communities in the Coachella Valley. Since then, Holmes has run her own pool and landscape maintenance firms and founded her first landscape design/construction com-

pany in 1980. She established her current firm in 1987 and now focuses exclusively on high-end residential projects including a number of celebrities' homes.



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By Brian Van Bower

Concerted Efforts



When I think about all the people I know from the mainstream pool and spa industry, one of the things that characterizes many of them is a strong, independent spirit. That's a positive, I think, but there's a possible downside in the fact that many of them are also convinced that theirs is the best (or only) way – and they certainly don't cotton to the idea of working closely with people from outside their own organizations.

I can appreciate that sort of independent mindset in many ways, but from where I sit, it's clear to me that this concept of the lone-wolf pool builder is losing ground fast. As I've stated in these pages before, the nature of modern watershaping is making ours a more collaborative business, and I for one believe that those of us who embrace the idea of teamwork are positioning ourselves for greater future success.

Working as part of a team, of course, is often easier said than done: It requires flexibility and in many cases a deliberate suppression of ego. It also means knowing when to stand your ground and when to bend. And the fact is that no two teams are ever alike and no two projects ever quite the same, which means that each job involves a process in which we must assimilate ourselves into a group at the same time we assert our expertise where our particular skill sets can move things along in positive directions.

By working in a team environment, we have the opportunity to demonstrate our value by providing expertise that others on the team don't possess.

To me, this is no more *difficult* than going it alone (in fact, it can be easier). Mostly, it's just *different*.

project profiles

In considering the outcomes I've seen flowing from the team concept, I can honestly say that the work greatly benefits from the process in just about every case. As I discussed in the January 2006 issue, the role of the watershape design consultant is fast evolving, and it's my observation that the results of layered, multi-faceted approaches are indeed greater than the sums of the individual talents involved.

In my work these days, I work with combinations of architects, landscape architects, general contractors, landscape contractors, interior designers and, most important, the clients themselves. And I find across the board that I fit in with and am accepted by those other professionals today where even a few short years ago I had the sense that getting my voice heard was an uphill battle.

Back then, I faced challenges on two fronts: First, I had to answer for the general lack of credibility the pool and spa industry had when it came to working on such teams; second, I had to establish my own credibility and credentials as a designer in a field with no formal educational requirements or tools that would help me establish my chops.

At this point and with lots of hard work, I've established myself and am welcomed as part of these teams. And it's not just me: I know other watershaping professionals who've plowed similar paths and won the respect of those with whom they're now collaborating.

My point is, by working in a team environment, we have the opportunity to demonstrate our value by providing expertise that others on



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the team don't possess.

Almost without exception, the people I've worked with on teams are more than willing to acknowledge gaps in their knowledge about what I do as a water-shaper. More gratifying still is that I now see every single project as an opportunity to expand my knowledge of what other team members do and how they look

at their roles in these projects. And I know well that all of that potential for professional (and personal) growth is the product of the open-mindedness that is required by the team concept.

Thus it happens that my work as a team member has led me to the firm conclusion that results are superior when we augment our own knowledge

with the skills, insights and ambitions of other people.

cases in point

All of that sounds good as an intellectual stance, but in the real world, I have to acknowledge that the processes of team formation and execution can be complex and tricky.

I'm currently involved in two large commercial projects that exemplify the overall dynamics: In both cases, the projects would simply not have been the same had the work been done by a single swimming pool designer/contractor – or by an architect or a landscape architect alone.

As I've mentioned before, I don't often pursue commercial projects because of the creative limitations imposed by inspectors and regulations. But some are too interesting to pass up – as were these two projects. What made them so attractive was my sense that there were project teams that had the discipline and skills to achieve great results.

Both of these projects involve high-end, oceanfront resorts with outdated pools, one in Florida, the other in Jamaica. In each case, the owners wanted to bring their facilities up to the state of the art. (At this writing, the Florida project is in the design phase, while the Jamaican project just went into operation.)

The Florida project is at the Ocean Reef Club in Key Largo, on the Atlantic side. The aim in this project is to rework the pools and areas around them, and the owners brought my firm in to work with ADP Group, a top-flight architecture firm from Sarasota, Fla., known for its precise project management.

The Jamaica project took place at the Round Hill Hotel & Villas at a site near Montego Bay. Fashion mogul Ralph Lauren is one of the owners, and his influence is clear throughout the property. In this case, the renovation of the pool area occurred in conjunction with renovation of some of the villas that overlook those pools.

Here, we were teamed with the Charlottesville, Va.-based landscape architecture firm of Nelson, Byrd & Woltz – another remarkably professional group that specializes in ultra-high-end work.

Continued on page 14

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In Jamaica, I worked with Thomas Woltz and Mary Wolf, who were already on board by the time I was brought in to work on the swimming pools.

In both cases, these firms were previously unknown to me, which meant that we had to go through initial phases of learning to work together. In each situation, they brought differing sets of de-

sign priorities that dramatically influenced the work.

out jamaica way

When I was brought in on the Jamaica project, I found myself in the not-unfamiliar position of having to express my vision for the job without giving away all of my ideas. That's a fine line to walk un-

der most circumstances, but in this instance we worked through the initial design stage fairly easily, largely because it was obvious from the very start that Woltz and Wolf had ideas for the project that were similar to my own.

In fact, we were so firmly on the same page that it was almost eerie at first. Before I arrived, they had already come up with a conceptual plan and a basic footprint for the pool and left it to me to flesh out the details of a large vanishing-edge vessel that would accentuate the ocean view.

The twist in this case was that we wanted to make use of the space below the edge and between the pool and the ocean to establish a gathering place with a bar, water walls and hydrotherapy jets I suggested to expand their basic concept.

Because they were working with the entire landscape design including the planted areas and pathways, we were readily able to integrate details of the pool area with the rest of the space. This involved us in detailed discussions of how visitors would access the area and the overall flow of the space, and our ability to learn from the experience and get inside their thought processes was aided by the fact that Woltz and Wolf were extremely easy to work with: Ideas kept flowing from all sides, and there was a great deal of creative give and take.

By virtue of the fact that this project was built outside the United States, we weren't hampered by the sorts of health department/building code restrictions that so often limit creativity back home. The upshot was that we were able to roll with ideas—including therapy jets in the catch basin, for example, as well as several shallow areas and a number of creative step and bench configurations—all without fear of the design being vetoed later on.

By contrast, the Key Largo project has turned into a sort of cat-and-mouse game with local health and building departments, both of which have very strong roles to play in determining what we'll be able to do with the design.

commercial keys

My involvement in the Ocean Reef project began at a very early stage. In

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fact, the architects had yet to do any conceptual work at all, so we were able to take a role in determining the overall layout. Ultimately, we suggested two separate swimming pools, one a freeform affair intended more for adult use with swimming lanes, a vanishing edge and tropical styling, the other a lazy-river pool with an island in the

middle – quite conducive to family fun.

We worked with a variety of people from ADP Group as our participation moved forward, and the design endured many tweaks and iterations before we landed on a final set of plans that are now under review for permits. Although the process was extremely positive and constructive, this team required more con-

vincing than did the landscape architects for the Jamaica project, and it was a relationship that definitely required more patience and persistence on our part.

Local codes were a real challenge: There could, for example, be no shallow lounging areas – but a beach entry was acceptable so long as we observed some strict slope requirements. We were also limited in the percentage of the pools' perimeters that could be obstructed by planters, but on the sides of the beach entrance, we had to insert barriers on the sides so that no one could step down into the shallow area. (Go figure.)

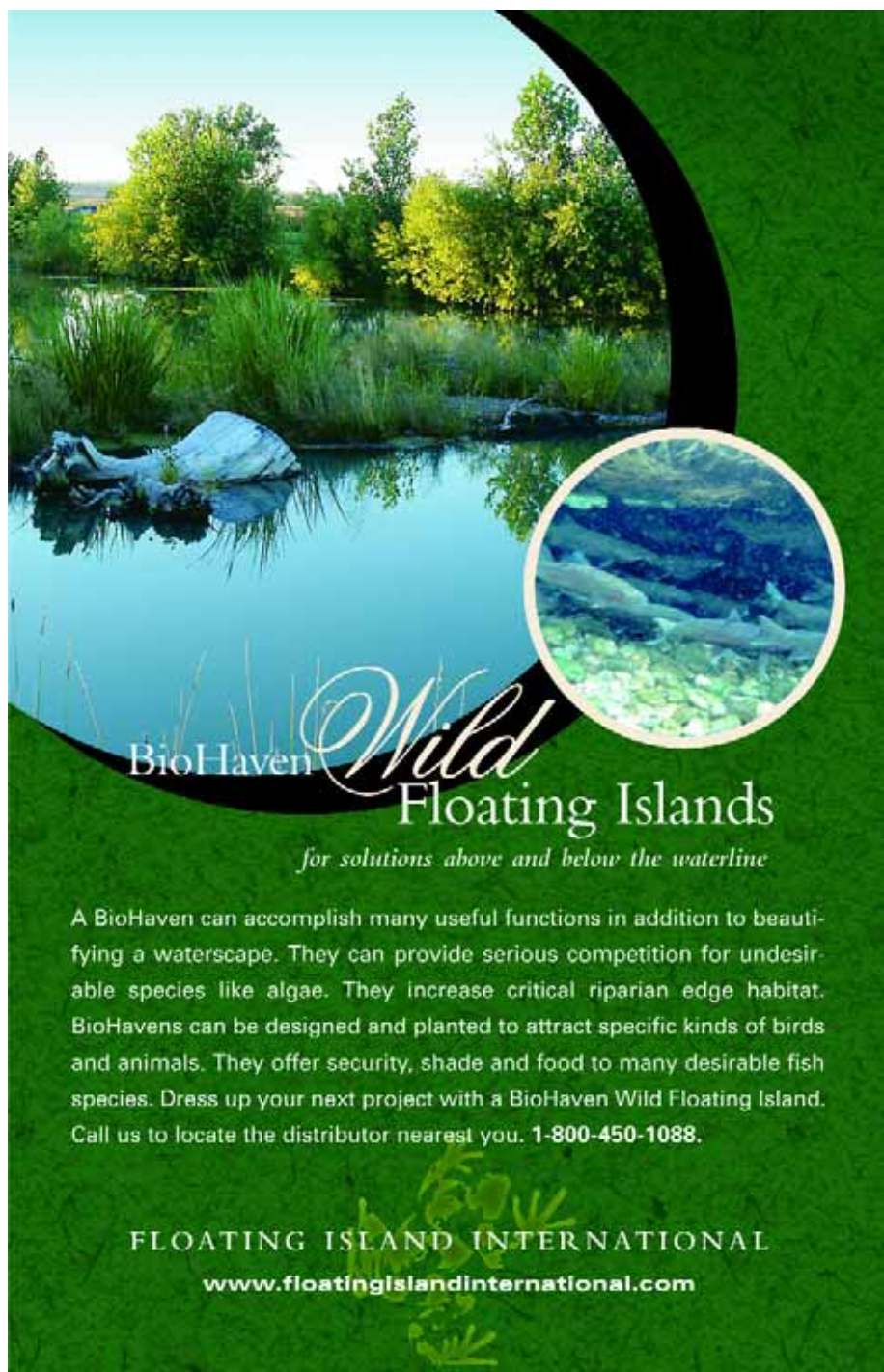
The lazy-river pool offered its share of roadblocks: We ran into trouble, for instance, because the river course is to be only eight feet wide, which made the inspectors worry about people jumping in and hitting their heads on the opposite wall of the pool. As a result, we had to limit the number of places where people could enter or leave the pool – as I saw it, a nonsensical process from end to end.

What all of these hurdles and negotiations mean is that we have to coordinate constantly with the architects to meet legal requirements while staying within bounds of their vision of the design. I'd made it known to the clients and the architects up front that we weren't going to take the project unless they were willing to push the envelope despite what the authorities might say. Wanting something special for their property, the clients and the architects were willing to go along.

At this juncture, we're still working through a number of issues, not the least of which is that existing rules don't make provisions for lazy rivers – even to the absurd extent that we have to call it a "counter-flow swim area" for them to deal with it at all. Then there's the bridge that will enable visitors to access the pool's central island without getting wet: The codes don't allow for bridges, so it may well end up that the only way to get to the island will be by wading over to it.

large in charge

In both of these projects, we have had the advantage of working with high-end commercial clients and equally sophisticated design professionals. Several times



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during both processes, it has struck me that ego could have become a real issue – but that never turned out to be the case.

Coming from the pool industry, I've been accustomed to being the top dog on projects – and I still am on many residential ones. But in the Key Largo and Jamaica projects I've discussed here, nothing would have gone smoothly had I brought my pool-industry baggage to the door. With egos set aside all around, we've been able to work with and around each other as a team and get things done.

To be sure, I've been part of teams in which one or more members haven't done a particularly good job of keeping egos in check. When that happens, it's a real challenge to not respond in kind, especially when the egos start getting in the way of optimum results. I've found that the key to traversing this tricky terrain is keeping the needs of the project firmly in mind – and keeping discussions as specific to the work and the details as possible.

In my case, successfully melding my ideas with the visions and ideas of other smart people has almost uniformly yielded positive results, not the least of which is that one project almost invariably leads to others. In fact, almost every team-oriented project I've worked on has led directly to other projects down the line. It's simple math: Instead of having just a homeowner or property manager appreciate my work and sing my praises, I have sets of two or three or four players, any one of whom might give me a call next week, next month or next year.

Yes, working as part of a team takes some adjusting, and it's not always easy. For me, however, the rewards in terms of superior results, expanding knowledge and networking opportunities are making it well worth the effort. **VS**

Brian Van Bower runs Aquatic Consultants, a design firm based in Miami, Fla., and is a co-founder of the Genesis 3 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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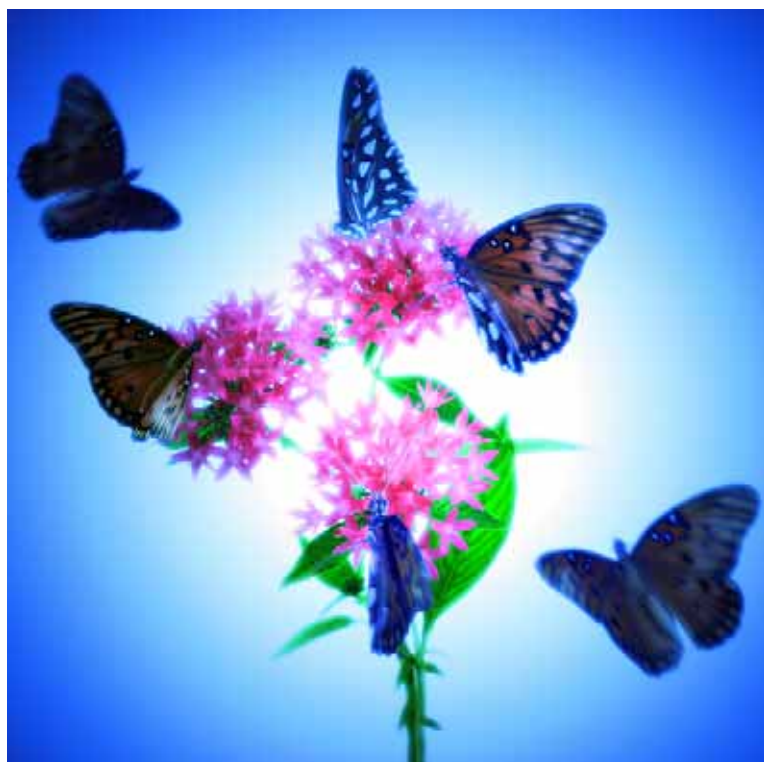
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By Stephanie Rose

The Butterfly Garden



With everyone's thoughts turning to spring, it's an opportune time to think about new ways to enhance our garden designs.

In addition to considering basic components that lay the groundwork for designs, I'd like to suggest looking for more specific ways to define and personalize our clients' spaces. You might explore gardens made for entertaining, for example, or spaces free of allergy-aggravating plants.

One prospect I've been considering lately (and will discuss here in detail) is ways of attracting beneficial insects to my gardens – specifically butterflies.

I always enjoy watching butterflies float through my backyard, gently land on their favorite flowers and then spread their wings to reveal stunning displays of nature's artwork. I remember chasing butterflies through our yard when I was a kid, trying to catch them in a butterfly net. That may have been politically correct at the time, but today, I've abandoned that barbarity in favor of simply enjoying the color and movement they add to any setting.

Many of my current clients recall the same sort of past experiences (and

Any kind of movement in a garden adds interest, so incorporating plants that attract butterflies is a subtle way of encouraging that impression amid all the static lines created by borders and pathways.

current joy) and express a desire for me to integrate plants that attract butterflies into their designs. You might think that just about any flowering plant will do, but the fact is that there are plants specifically reputed to draw these beneficial creatures into a garden.

setting a stage

From a design perspective, any kind of movement in a garden adds interest, so incorporating plants that attract butterflies is a subtle way of encouraging that impression amid all the static lines created by borders and pathways. As long as the visitors do no harm, any animal or insect that finds its way into an outdoor setting will add a dynamism that will draw visitors into the space and keep them there.

Butterflies in particular add a real spark to garden settings. They come in various shapes, sizes and colors. My area enjoys lots of orange- and yellow-toned species – an invasion that even those who despise the thought of yellow or orange in their gardens will come to love. (I challenge anyone to find a client who wants to repel butterflies from a garden just because they are orange or yellow!)

The experts on the subject start with the obvious observation that butterflies prefer colorful settings, but they go on to say that butterflies also seem to prefer natural gardens to those that are manicured or overly maintained. This makes sense: Plants in the wild aren't regularly clipped or sheared, and my own experience shows that gardens with plants in random, overgrown, naturally integrated forms are more likely to be visited and inhabited by butterflies.

Just like all of us, butterflies need food and shelter. We can easily meet one need by providing them with nourishment in the form of their favorite flowering plants, and we can create sheltering areas or include butterfly houses and food

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For watershapers, it's significant to note that butterflies are drawn to water as well as to plants. They prefer natural environments, so they are more likely to be attracted to ponds, streams or other natural watershapes than to pools or spas.

for caterpillars that will support an ongoing natural cycle.

It's also true that butterflies prefer sunny spaces, mainly because sunlight helps them maintain a body temperature that lets them stay active. Moreover, flowering plants that grow in the sun also tend to produce more nectar for their dining pleasure.

The experts say they are attracted to masses of same-colored flowers, so a big clump of Echinacea, for example, is more likely to attract a butterfly than is a single specimen plant in the same setting. Planning a garden that flowers throughout the year is another way of addressing their ongoing interest and need for nourishment.

One other important factor to consider is that adding chemicals and certain fertilizers to a garden might discourage any influx of butterflies. If the additions make the food less tasteful, the butterflies will reject the nectar and the caterpillars will seek other leaves. (It's kind of like going to a bad restaurant: If you aren't happy with the food, you'll move on to a better establishment next time.) And of course, the butterflies or caterpillars may even be killed if the chemicals or fertilizers are toxic.

choosing wisely

For watershapers, it's significant to note that butterflies are drawn to water as well as to plants. As mentioned before, they prefer natural environments, so they are

more likely to be attracted to ponds, streams or other natural watershapes than to pools or spas. But even something as simple as a birdbath can be incorporated into any design as a way to support plants and flowers in creating an attractive environment.

Butterflies are also drawn to nooks and crannies as shelter and for protection during the winter months. Old or dead trees, rock walls, aging wood or other structures that offer small, protected spaces should be embraced as a necessity in this type of garden. Although these features may attract other insects your clients may not consider so fondly, there may need to be some trade-offs.

Of course, butterfly populations vary from place to place, which makes it difficult for me to suggest plants that will work in any setting or for any specific butterfly. There's also the point the experts make that butterfly size and anatomy are big factors in determining the plants to which they're attracted. Be that as it may, I offer this brief list of plants that have worked for me as a means of triggering your own thought processes. There's much from which to choose!

► **Syringa vulgaris (Lilac).** The flowers and fragrance attract butterflies in the spring.



▲ **Digitalis (Foxglove).** Depending upon your location, these can bloom throughout much of the year to offer butterflies a reliable food source.

► **Viburnum.** Mostly grown for its foliage, many varieties of Viburnum offer attractively clustered flowers, particu-

larly during spring.

► **Ceanothus griseus (Carmel Creeper)**. A great slope cover, this plant's fragrant flowers have a long blooming season that lasts through spring in warmer climates.



▲ **Buddleia davidii (Butterfly Bush)**. As the name suggests, this is a favorite of butterflies and has always been a sure-fire selection for me. It comes in many colors, including white, pink, lavender and purple and additional benefits of this plant are its fragrance and its utility in cut-flower arrangements.

► **Cistus (Rockrose)**. These drought-tolerant plants have striking flowers that hang on through the long, hot summer months.



▲ **Lavender**. These plants, with their flowers and fragrance, will attract not only butterflies, but also curious humans.

► **Asclepias tuberosa (Butterfly Weed or Milkweed)**. Often thought of as a pest in the garden because of its milky sap, this plant is nonetheless a prime source of food for Monarch butterflies and is known to attract many other butterfly varieties. Planted in masses, its golden flowers are

sure to attract a variety of winged creatures.

► **Campanula (Bellflower)**. A strong spring bloomer, this plant comes in many varieties and forms.

► **Centranthus ruber**. This epitomizes plants suited to butterfly attraction: Its completely natural form and significant

blooms offer an ongoing food source for any type of butterfly.

► **Alcea Rosea (Hollyhock)**. The tall spires of hollyhocks provide spaces for butterflies to rest in the sun, high above lower border plants.

► **Verbena**. Available in many sizes

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natural companions

and varieties, these small but multi-flow-
ering plants should be scattered through-
out any butterfly garden in one form or
another.

► **Achillea (Yarrow).** Yarrow's flat
flower clusters not only provide food for
butterflies, but in sunny spots double as
places to perch and bask in the sun.

► **Lantana.** As is true with Centran-
thus, this plant's multi-clustered flowers
are the typical form suggested by experts
for attracting butterflies.

► **Lonicera (Honeysuckle).** This
flowering vine is well known for at-
tracting hummingbirds as well as but-
terflies. Its fragrance and exposure ver-

satility makes it a great selection in lots
of settings.



▲ **Heliotropium arborescens (Helio-
trope).** I particularly like the dark pur-
ple variety of this flowering plant: It helps
add depth and dimension to otherwise
brightly colored palettes and has a great
fragrance as an added bonus.

a final note

When my daughter was five, we sent
away for a butterfly house that came com-
plete with larvae, a cellophane-sided box
to serve as a shelter and food for them
to grow on in preparation for their trans-
formation into butterflies.

We watched the caterpillars spin cocoons
and weeks later emerge as beautiful but-
terflies. Better still, we timed their growth
and release to coincide with my daughter's
birthday party in July, so everyone in at-
tendance could enjoy watching them fly
out of their artificial habitat and disperse
themselves throughout our garden.

This is the sort of experience that makes
butterflies a favorite – and I'm certain your
clients will agree! **MS**

Stephanie Rose runs Stephanie Rose
Landscape Design in Encino, Calif. A specialist
in residential garden design, her projects of-
ten include collaboration with custom pool
builders. Stephanie is also an instructor on
landscape design for the Genesis 3 Design
Group. If you have a specific question about
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By David Tisherman

Standard Bearers



I want to clear up a misconception: Although the programs my colleagues and I stage through Genesis 3 are easily associated with the “high end” and the work of several people associated with our programs may be said to exist at the cutting edge of watershape design, it is simply untrue that we are promoting construction standards that somehow go above and beyond what the rank-and-file industry should be practicing.

When we talk about watershape “design” and “construction,” it’s important to understand that although those two things go hand in hand, they are completely separate considerations. *Design* is what makes pools and spas either ordinary or extraordinary and is about materials selection, shape, color, elevations, lighting, water effects and location in a setting – basically a whole range of aesthetic possibilities, bells and whistles.

For its part, *construction* is a completely different animal. Whether you’re building a basic, unadorned rectangle or an all-glass-tile pool with a vanishing edge hanging off the side of a mountain, the standards for construction should *always* be the same, without exception. In fact, when it comes to construction, I believe the terms “high end,” “cookie-cutter” or

All clients deserve to have their watershape investments protected and their patronage respected by our industry in the form of reliable structures and systems.

“midrange” are completely irrelevant.

Our industry isn’t about promoting *high-end* construction practices to be followed by a few; instead, it’s about pursuing and advocating *sound* construction practices that should be applied by *everyone*.

just awful


If there’s one thing about the watershaping world that continuously drives me crazy, it’s the existence and persistence of a sub-professional mindset that says creative designs and affluent clients deserve one set of standards, while projects with more affordable designs can acceptably be built to another, less stringent set of standards.

To me, middle-class clients who’ve commissioned modest projects deserve watershapes built to standards every bit as reliable and effective as affluent clients who are looking to impress their wealthy neighbors.

Frankly, viewing things any differently amounts to a form of class-based discrimination. To those who cut corners on basic construction just because the project price tag isn’t in six figures and you feel a need to scrape out a bit more profit, I suggest either changing your approach – or getting out of this business and going off to ruin someone else’s industry!

I feel so strongly about this because I’ve encountered absolutely jaw-dropping construction misadventures over and over again. I’m not talking about a state of affairs of years gone by, not by a long shot. No, I’m talking about projects that are being built right now, and they’re a bloody disgrace.

In these pages, I’ve often compared watershapes to automobiles. We all know the marketplace is filled with affordable cars as well as those that cost more than some people’s homes. Imagine a world in which Hondas, Toyotas, Chryslers,

A woman with dark hair and red lipstick is lying on her back in a swimming pool, her head resting on the pebble-textured pool surface. She has a serene expression with her eyes closed. The pool's surface is composed of dark, smooth, rounded pebbles. The background is a soft-focus view of the pool's interior, showing more of the pebble finish and some water ripples.

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Fords and Volkswagens were built to a lower safety standard just because they cost less than \$100,000. If the automobile industry applied the same approach that we see in watershaping, road fatalities would shoot off the charts.

Yes, Ferraris, Porches, Jaguars and BMWs are prettier and have fine leather interiors, advanced electronics, expensive paint jobs, fancy wheels and dozens of other details that are superior to more-affordable cars, but they are not superior when it comes to having functioning brakes and headlights or reliable engines, seat belts and air bags.

Every driver on the road deserves to operate a vehicle that is safe and reliable. Period. I can imagine some of you thinking that watershapes are luxury items and do not warrant being seen in the same light as automobiles. To that I say, "Bunk!"

First of all, watershapes represent significant investments to those who sign the checks, and these clients deserve to have their investments protected and their patronage respected by our industry in the form of reliable structures and systems. Second, there are safety concerns with watershapes, and in some very important respects, inadequate construction does in fact result in physical hazards.

punch lists

To make this point more clear, let's get specific. (And forgive me for specifically sticking with pools and spas here, as it is the focus of my experience and expertise.)

Let's begin with concrete itself, the most fundamental of the materials we use. I've been stunned time and again when I've been




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involved in cases where core samples of existing failed structures indicate that concrete has been applied to 1,500 psi or less. These shells, of course, should be built with concrete at a minimum of 2,500 psi.

There's no mystery to why someone would go with less. It doesn't take a detective to know that these weak structures are out there because some contractors deliberately fail to put enough cement in the gunite or shotcrete mix in order to save money and boost the bottom line. They hope, of course, to elude detection. After all, the concrete structure is invisible once the work is finished, and if it doesn't fail, who will be the wiser?

I get angry just thinking about that rationalization. It is unethical, crooked even, and it should never happen – but it does, unfortunately, and probably on a daily basis among some builders.

And what about structural engineering? One of the Top Three Stupidest Things anyone has ever said to me came up just last year when a subcontractor remarked, "Why do you want to bring in a structural engineer? All they do is ruin projects."

Let me be very clear: No builder in this business determines the structural design or the ultimate cost of a shell or its supporting substructure. The soil conditions do! This is why it is dangerous to build any concrete structure without the input of a geologist, soils engineer and structural engineer. Even so, I know at this very moment that a huge number of projects are being built without this crucial information and engineering support.

And how about structural steel? I'm amazed at those who, lacking a structur-

al design, will more or less "eyeball" a steel structure, maybe using #3 rebar on 18-inch centers with no idea whether or not that is what the situation requires. Then there are those who don't use dobies to provide necessary clearances between the steel and the soil. This one blows my mind! If the steel isn't encased in the concrete, the structure is not properly rein-

forced. Yet we see it all the time: Rebar lying right against the soil as the concrete crew begins shooting.

To think that some people wonder why pools crack – simply mind-boggling!

the beat goes on

In some cases, there are builders who actually tell their clients what they're up



This project is bad on many levels. First there's the soil, which is not native, was never compacted and was strewn with junk (roots and other debris) at the time the concrete was applied. Also, the framing was slipshod, lightweight and bound to move during concrete application. Then there's the use of flex pipe, which has not been recommended for watershape applications for years, particularly not in regions (such as the one in which this pool was 'built') where freeze/thaw conditions prevail.

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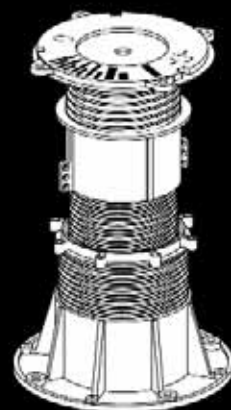


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to on some fronts and try to pass it off as a good thing. One of the great examples of this is found in the area of plumbing and circulation systems.

For years now, we at Genesis 3 have been pushing the notion that if we're going to be in the business of moving water through pipes, it's mandatory (not to mention common sense) to apply fundamental hy-

draulic science to the process. That only seems reasonable, but we live in a time when there are many people out there who still use small pipes and oversized pumps.

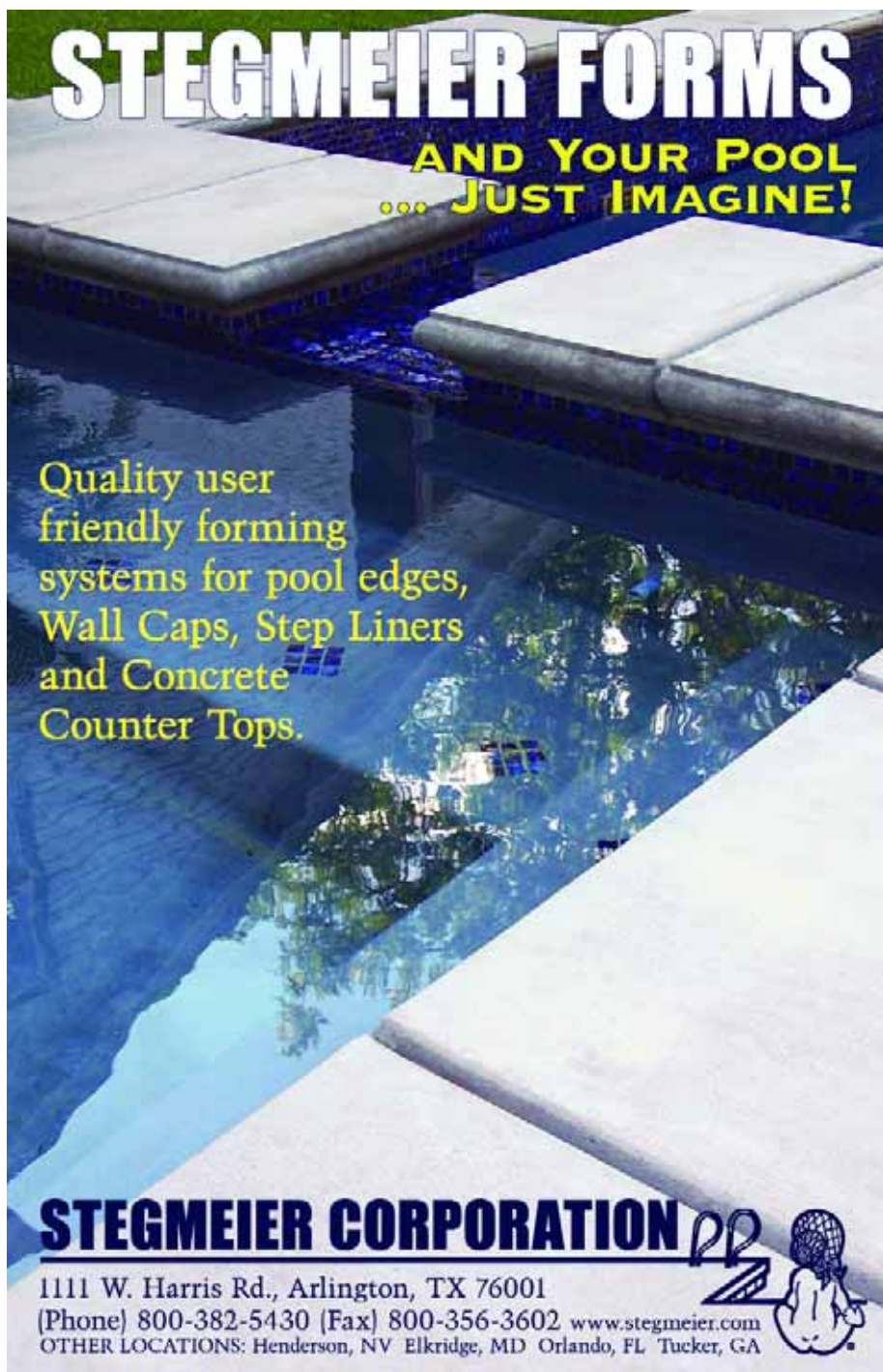
I suppose the twisted logic goes something like this: We can save money on the plumbing by going with a smaller size, but we're going to give the customer more bang for the buck by upsizing the horsepower

on the pump (at a somewhat greater cost, of course). After all, if one horsepower is good, then two must be better.

There may have been a time years ago when people in this industry truly didn't know any better, but these days there are absolutely no excuses on that front. Sound hydraulic information is available from every single manufacturer of pumps, motors and filters; Genesis 3 offers detailed coverage of these topics in its Level 1 and Construction schools; good information has been published repeatedly in all the trade media; and seminars on hydraulics are presented at just about all trade shows, good and not so good.

We as an industry *know* that larger plumbing and smaller pumps make for more efficient circulation and thus more energy efficiency and longer service lives for the components. Still, under the guise of "doing the client a favor," there are those who stick to a false and antiquated way of designing circulation systems. Is it really that hard to follow manufacturer recommendations for pump, filter and plumbing sizing?

Then there's the subject of main drains and safety. Out there in the real world are lots of pools with oversized pumps on undersized plumbing attached to single main drains. Flat out, you're endangering your clients if you still build (or remodel) that way when you should, in fact, be splitting your main drains, upsizing your plumbing and shrinking your pumps on both new construction and renovations. It's simple: Do the job right and measurable risk virtually disappears; do it wrong and



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you're courting disaster not just for your clients, but for yourself as well.

The same sort of thing applies to electrical systems. It's staggering to me that there are watershapers out there who put people, water, metal and systems run by electricity together in the same environment without properly bonding and grounding metal components and structures in and around the water. This isn't even something that saves money: It's just plain laziness and carelessness (not to mention a code violation), and if it's you, I can't help asking: Are you *trying* to kill someone?

on points

I could go on with this cathartic exercise, but I'll stop here with my discussion of sound and unsound construction before I even get to pet peeves having to do with tile setting (can you believe there are jobs out there where no tile float was ever applied to the raw concrete surface?) or setting up deck drains (forget about visually concealing drains — how about just making them work?) or plans lacking in any detail. There are also points to be made about using rebound to build steps (one of my constant agonies) and decks built without proper expansion joints.

My point is, you can look at just about any aspect or detail of watershape construction and find scores of examples of how people in our industry, working right now in backyards all across the country, are completely ignoring what mostly boils down to commonsense construction practice.

Let me stress the fact that this isn't



The lityny of horrors with this project continues with the fact that no steel was placed for the steps or benches — an open invitation to shrinkage cracks — and what steel there is has been arranged haphazardly and below minimum standards. This makes it hard to credit the builder for the split drain, and while I can see a bonding clamp, who knows whether it will actually be used? No client deserves such shabby service from a contractor — no ifs, ands or buts.

about the "high end" or the "cutting edge" or custom-versus-volume production. Genesis 3 or no Genesis 3, what I'm talking about here is a fundamental obligation everyone in this trade has to provide clients with a baseline of quality construction based on reliable technical information. It's a moral issue, an ethical issue and simply the right thing to do.

I'm not saying you have to bring free-way-type, A+ engineering and construction to basic pool projects. What I am saying is that we as an industry need to face up to our responsibilities, raise the bar and be aware at all times that cutting costs with basic construction is a foolish way to scratch a little extra profit out of a project.

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watershapes deserve Ds and Fs when it comes to construction quality, it's time for all of us to hit the books, learn good construction practices and pick our grades up at least to Cs. In an environment where Bs and As are reserved for projects that exceed construction norms and deploy great materials, exacting tolerances and fine finish work, if we can't at least strive for Cs as an industry, we're not providing products, we're offering a disservice. **MS**

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



By way of contrast to the other project depicted in this column, the construction approach seen here — framing, steel, plumbing, the works — is essentially bullet-proof and will lead to a positive outcome for the client. Yes, doing things the right way takes knowledge, supervision, determination and a proper budget, but it's something every client has a right to expect.

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Floating on Sunshine

By Juan Roca

‘I want the house to look as though it is floating on water.’

That was what architect Victor Canas told me when I was called out to visit this site on the northwestern coast of Costa Rica. It was a brilliant idea, certainly one that befitted the spectacular mountaintop setting and its breathtaking 360-degree views of rugged coastline, forest greenery and assorted perspectives to horizons in all directions.

I had the advantage in this case of already having built a much more ordinary swimming pool for the homeowner some 20 years ago – and the further edge of being the only watershaper in the country in the business of designing and building such ambitious projects. When the architect showed me an overhead view of the home’s footprint and the space for the pool, I was inspired: I knew right away that this was going to be something special.

For his part, the client simply said that he wanted something wonderful and was willing to trust my judgment. I knew he was serious, given the soaring architecture of the home and its spare-no-expense approach to every detail. More than a year in the making, this pool is the most ambitious and beautiful I’ve tackled to date.

Photos by Jordi Miralles, Barcelona, Spain.





Set high on the bluffs overlooking Costa Rica's Pacific shoreline, this dramatic composition in water, tile and water-in-transit effects stands as his best work to date, asserts watershaper Juan Roca. When it first appeared on the magazine's cover late last year, it was still under construction. Now it is complete, he says, which leads him to share new images of his masterpiece in modern design and high-caliber watershaping.

The setting is ideal for a vanishing-edge application, with water-on-water and water-on-greenery views in every direction across the water-shape's broad reflective surface. And the fact that the water is shallow over much of that surface brings the glass tile into play in ways that lend a wonderful texture to the overall setting.



The High Life

As I explained in the December 2005 issue of *WaterShapes* ("Pure Vision," page 48), Costa Rica has experienced an upsurge in affluence in recent years. Within that sweeping trend, however, this particular home project sets a new standard for grandeur and opulence amid the Central American landscape.

As is true of many of the high-end projects I'm doing these days – especially those with similarly glorious ocean views – the vanishing edge is a prominent feature here. In this case, the approach has been taken

to something of an extreme: On the view side, the pool has a sweeping, 100-foot-long edge that stretches from one end of the house to the other.

The majority of the wet area is actually just six inches deep – a reflecting pool covered in more than 3,300 square feet of a rich, dark-colored tile mosaic in the Moroccan Desert pattern from Ocean-side Glasstile (Carlsbad, Calif.). A small, deep section is tucked up alongside a portion of the home's angled glass walls – an unusual configuration with a depth that is nearly indistinguishable from

most viewing angles.

The entire broad surface reflects both home and sky, providing an extraordinary intermingling of reflected light, gently rippling water and mirrored views of the home's architecture from a variety of exterior and interior spaces. I'm proud of the fact that I brought several ideas of my own to the design process, including the key decision of setting the elevation of the water at the same point as the interior floors of the home.

The water is separated from the home's glass panels by a narrow slot-overflow



feature that runs the entire length of the pool. This almost-invisible border was inspired by similar treatments I've seen in the work of the late, great architect John Lautner and his equally amazing protégé, Helena Arahuate.

This knife-edge effect, coupled with the sameness of levels between the interior and exterior spaces, allows for easy visual connections between the spaces and creates a fantastic intimacy between the living spaces and the shifting reflections outdoors. Now that it's finished, the effect is sublime and seems effortless,

but it required substantial support in hydraulic design and construction planning from Skip Phillips, co-founder of Genesis 3 and owner of Questar Pools & Spas of Escondido, Calif.

To ease passage to and from the "floating" home and provide clear access to great viewpoints, we installed wooden bridges and cantilevered decks over the water's surface at several points. All of these features are set off by glass panels and stainless steel mountings that integrate them as dynamic extensions of the home's interior.

Precise Simplicity

With hundreds of linear feet of water-in-transit edges – every inch crucial to the overall visual effect – our crews worked extraordinarily hard to establish all weirs with near-zero tolerances. It paid off: When we started the circulation system up for the first time, we made only a few minor adjustments to achieve uniformly wetted edges at extremely low flow rates.

To move the water over the vanishing edge and into the overflow slots, we installed three two-horsepower WhisperFlo pumps from Pentair Water Pool & Spa



The long views across the water are always spectacular no matter the vantage point or the time of day, especially when taken in from a point at which you can clearly see that the water level is the same as that of the floors inside the home. But if you get up close with a more vertical perspective and the right light, you can also see the access point to the pool-depth section of the watershape alongside the home.

(Sanford, N.C.). The water is filtered by three Pentair cartridge filters and is sanitized by a saltwater sanitizing system from AutoPilot (Fort Lauderdale, Fla.) combined with an ozone-generating system from DEL Ozone (San Luis Obispo, Calif.). At night, three PG 2000 fiber-optic illuminators from Pentair enhance the ambience.

The striking simplicity of the pool works with the geometric minimalism of the home's architecture to amplify the near-intoxicating natural beauty of the surroundings. I've spent enough time

on site to know that it can be difficult to keep your mind on what you're doing because the views are so compelling. The verdant coastline stretches literally as far the eye can see, all the way to Nicaragua in the northwest.

So spectacular were the results that I came to view photographing our work as part of the project itself, not as an afterthought. I took scores of pictures as the work unfolded, and things were far enough along last fall that I was able to include a representative shot in my December article. But the images you see





The sense that the home is afloat is enhanced by wooden structures that reach out over the water in the form of a bridge that does actually span the water and by a section of deck that punctuates the vanishing edge to provide a uniquely inspiring viewpoint over watershape, forest, coastline and ocean.





here aren't mine: They were taken by a professional – a remarkable artist who did a particularly wonderful job of capturing the subtle dance of light on the water that takes place as the sky changes during the day.

As you'll see in these images, as special as the pool may be, our success here is all about the way the water reflects the setting. In that sense, this project was never about the pool, but about what it could lend to its exquisite surroundings by serving as a mirror to that environment.

The way I see it, the pool is a giant looking-glass from which the home will rise forever, floating on an ever-changing canvas of light, color and bewitching beauty.






As day fades into evening, the setting undergoes a remarkable transition that truly brings out the best of the watershape's reflective qualities. This is when the flow across the interior and exterior surfaces and the knife-edge slots make their boldest contribution – but at the same time serve as little more than sidelights to the up-close reflections and the spectacular distant views.





Flames On

By Karl Nettmann



Pyrotechnic-effects expert Karl Nettmann has been involved with creating dramatic flame effects for more than a dozen years – first for television and film productions and now in landscapes and other ‘real world’ spaces. Here, he discusses the range of effects that can be achieved using fire, the technology behind common systems and basic safety considerations that must be accommodated no matter the simplicity or complexity of an effect.

As part of my work on movies and television shows through the past dozen years, I've developed a range of special effects that focus specifically on fire. For the science fiction hit *Men In Black*, for example, I was charged with devising the flame-spewing weapons wielded by Tommy Lee Jones and Will Smith in a spectacular scene in which they shoot down a flying saucer.

That system involved a range of safety issues along with devising a specially formulated fuel (alcohol mixed with various metals) to create blue flames as well as a combination of inert gases and electronic control systems that were used to extinguish the fire and protect the actors. As is the way with so much in Hollywood, an onscreen sequence that lasts just a couple of seconds took my team *months* to design and build.

Of all the myriad effects I've built through the years, those that use fire are the most dramatic, complex and interesting. They're also the most rigorously tested, because in the world of movies and live actors, there is *zero* tolerance for error when it comes to the use of these effects.

Starting about four years ago, I began turning my attention away from the entertainment industry and gradually came to focus on working with fire in landscapes and as a sculptural/artistic medium. Much as water-shapers wield and control water to create experiences for their clients, I've endeavored to do the same in working with fire. I still work occasionally on film or television projects, but the use of fire in places where people are directly and more casually exposed to it is my passion these days.

Elemental Science

Through the years, I've come to develop a profound appreciation and respect for fire, for the technology used to contain and control it and for its ability to create powerful aesthetic experiences for those who safely come near or view it. Whether in a room or a landscape or on a television or movie screen, it simply overpowers any other visual element in its environment.

One of the challenging things about fire effects in the movies is that audiences have become desensitized to the presence of fire in the form of explosions, weapons, disasters and other infernos, which leaves effects specialists with the constant challenge of developing more and more outrageous effects.

In the real world of landscapes and/or interior spaces, however, fire is dramatic and compelling no matter how small or large a form it may take. Everything from candles and torches to fireplaces or fire rings become

**Controlling fire
is one of the
hallmarks of
humanity, right
up there with
our capacity to
control water,
domesticate
animals and
use language.**



Photos courtesy Automated Fire & Water Effects, Las Vegas, Nev.



immediate focal points and transform the ambience as well as the way we view everything that's bathed in the light of their flames. Where fire in the movies is all about spectacle, in real-world environments it tends to be subtler. Nonetheless, I'd argue that it retains every bit of its awesome, elemental power.

That sense of potency probably has a lot to do with the fact that controlling fire is one of the hallmarks of humanity, right up there with our capacity to control water, domesticate animals and use language. Fire warms us, cooks our food, makes many forms of transportation and industry possible and, for thousands of years (until television displaced it), was the centerpiece of our homes.

While it is profoundly productive, fire obviously is also amazingly destructive. It's a key component in religious ceremonies and private and public celebrations, but it's also associated with war and the ravaging of forests and grasslands. It warms, but it burns as well.

These productive/destructive dualities are why, from an aesthetic/design standpoint, fire evokes such profound emotions in those who view it and come near it. When it's surrounded by darkened spaces and lower light saturation, the eye literally blocks out the rest of the scene and perceives only flame. When it is under control, there is something inherently exciting about sitting near a fire – an ancient emblem of humankind's mastery of nature.

We are strongly drawn to the natural, wild beauty

From modest firepits and torches to grand applications of a monumental sort, fire is fast becoming a more common design feature for outdoor spaces both public and private. And no matter the scale, these fire features immediately become a dynamic focal point.



of fire, but we're also keenly aware of the artificial structures and systems that make it safe to approach – structures and systems that enable us to view it without fear and get close enough to enjoy the warmth. I've seen spaces where a designer has frustrated that instinctive attraction, the result often being that, as with waterfeatures, observers will take it upon themselves to defeat barriers and will traipse across planted areas or other obstacles to come closer.

The upshot of this human compulsion to be around fire is that landscape and watershape designers must be fully aware of the power that fire encompasses while putting it into safe and appropriate environments. Above all else, fire must be used with great and deliberate care.

Incendiary Perspectives

In my work, I am endlessly intrigued by uses of fire with water – a particularly powerful linkage given the fact that water can destroy fire. (The same sort of contradiction works in the opposite way with fire and stone or metal in that fire can't destroy either one, but I find fire and water to be the most compelling of all possible combinations.)

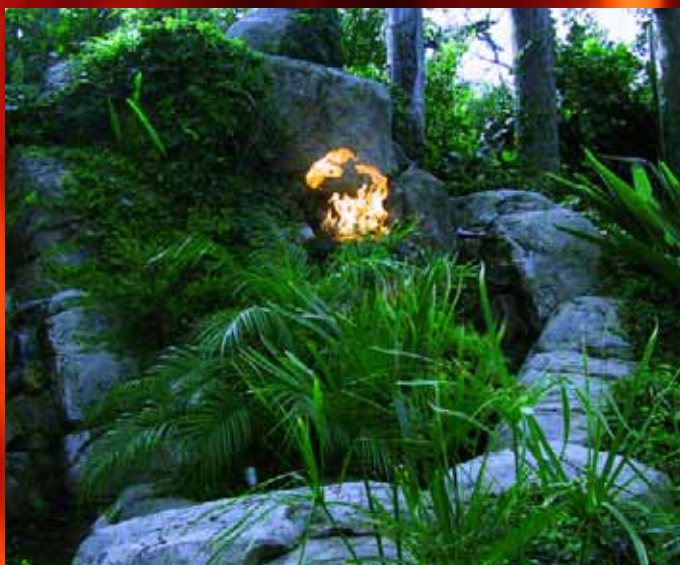
In the vast majority of situations, fire and water work together by virtue of proximity: A fire pit or fireplace by a pool, pond or fountain, for instance, creates an exciting dance of light on the water's surface, with the reflective value of water working hand in hand with fire to create extraordinarily dramatic effects.

Applications that feature fire and water together are always among my favorites, perhaps because water has the potential to destroy fire. Whether the surface is turbulent or still, watching flames dance on the water is mesmerizing in any setting.



Photos courtesy Automated Fire & Water Effects





Falling sheets, rivulets or streams of water that reflect and distort the light of a fire all create constantly changing displays that will always draw the eye, but a reflected view of fire across a quiet pond or swimming pool can be equally evocative and often serves as the most mesmerizing element in a given landscape.

In some cases, we see systems that seemingly bring fire and water into direct contact – flames rising from a quiescent plane of water, or perhaps rising out of the top of a waterfall to create a volcano effect. All of these systems require a great deal of control of both elements during design and installation if they are to function as intended for a long, serviceable haul.

As is true with water effects, the type of impression you want to make must be fully considered and accommodated from the design phase forward. In some respects, it's also similar to landscape or watershape lighting in that fire is best not left as an afterthought.

This means that the designer needs to understand and encompass a matrix of possibilities. A small, subtle candle effect with flame heights of an inch or two, for example, can be just the look you want. But then you have to decide whether to achieve it with candles, oil-fueled torches or permanently installed feed systems that produce small flames with natural gas.

For larger effects – a medium-sized fire, say, with 12-to-15-inch flames – you have to decide whether the flame is 15 inches tall with a narrow source or 15 inches wide with a more diffuse source. If you opt

This sequence of photographs of a fire effect on a waterfall demonstrates why people are so fascinated by fire: As the flames dance, they change constantly. No matter how long a time you spend watching them, they never fall into a pattern or become predictable and boring.



for the latter, you'll be working with a basic omni-directional flame source of the sort commonly found in outdoor fire pits – an easy choice. But then you need to decide whether to contain it in a conventional way or to go for the unexpected and house it within a pottery vessel or metal sculpture and whether to place it near the pool or off in a planter – or even on a separate deck or overhanging balcony.

Then there are extreme effects with flames in the 18-to-36-inch range: These are usually produced with large burners designed to produce dynamic “fireball” effects, and while they are less commonly used in residential settings because their radiant heat can scorch things several feet away, they can be very dramatic if proper observer distances are maintained and the surrounding structures, pathways and seating areas are designed to ensure a heightened level of safety.

In different applications, fire can be used to mark boundaries and pathways, as with tiki torches. These versatile oil-

Gas Pressure

As mentioned in the accompanying text, natural gas is preferred over propane as a choice for fueling decorative fire effects. Beyond the fact that natural gas is lighter than air and therefore not given to accumulating in low spaces (as is propane), it is also supplied at a constant pressure.

Homes on the outskirts of areas with developed utility infrastructures often rely on propane for cooking and heating and feature large propane-storage tanks that must periodically be refilled. As the propane supply in these tanks diminishes, the tanks lose pressure. (This is because the liquid propane evaporates to a gas, a process that makes the liquid very cold and effectively lowers the tank's internal pressure.)

For temporary fire displays, I have seen hot-water “bath” systems used to battle this pressure-lowering effect. With permanent propane-based installations, there are also vaporizers that use flames to boil the propane and turn it from a liquid into a gas. (The famous volcano system at the Mirage Hotel in Las Vegas uses this type of system, as do various displays at amusement and theme parks.) These sophisticated systems are quite costly, which is a key reason they are seldom seen in residential fire effects.

One of the reasons designers reach for propane in such high-profile settings is that it produces a much richer orange flame than does natural gas. For the vast majority of residential applications, however, natural gas is clearly the sensible option: It's supplied directly to the site at a constant pressure, you don't ever have to refill a tank and, being lighter than air, it dissipates more quickly when released into the open air.

Another advantage of natural gas is that it stinks. While both propane and natural gas are inherently colorless and odorless, utilities add a rotten-egg smell to natural gas courtesy of ethyl mercaptan. This makes gas leaks easy to detect.

–K.N.



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fueled devices can also serve a dual purpose as insect repellents when additives are placed in the oil. In visual terms, however, they can be used to create fascinating effects as they flicker atop walls or behind plantings, trellises, glass panels, sculptures or metal screens. They can be used to frame distant views, highlight the corners or contours of a body of water, define an entrance to a space or give shape to an architectural or sculptural feature.

Shaping Flames

The ranges of possible effects and the systems used to generate them are both extraordinarily broad. For a great many applications, manufacturers of fire systems provide reliable, off-the-shelf systems that come complete with burners, fuel-source lines, manifolds, ignition systems, electronic controls, gauges and shut-off valves. In a vast majority of situations, making use of these pre-engineered systems and following manufacturer directions and local codes to the letter will do the trick.

For these purposes, companies such as Automated Fire & Water Effects (Las Vegas), Grand Effects (Mission Viejo, Calif.) and others provide standard systems for fire pits, cauldrons, torches and more. They can also work with you to develop fully automated systems that achieve a wide range of custom effects.

As is true with water, flame can be shaped in a number of ways. It can be directed into distinct, aggressive vertical shapes with high-pressure fuel systems, or it can display billowy, soft textures at low pressures. It can vary in color from very red and orange (with low-oxygen mixtures) to very blue or even invisible with high-oxygen mixtures. (The more oxygen, the hotter the flame – and the less carbon will build up on surrounding surfaces.) A hot flame can even be used to heat an iron or steel sculpture to make it glow red/orange – a stunning visual effect.

What I've seen in recent years is the emergence of a growing number of sculptors who use fire in their compositions. They'll

make burner systems into details that are of equal aesthetic importance to the flame itself instead of treating them as utilitarian devices intended to do no more than emit flame. In some pieces, fire is used to react with metals including certain alloys of copper, aluminum, steel or titanium to produce different colors: A flame against a hot sheet of copper, for example, will give off a green tinge, while against steel it will generate a vivid orange/yellow color.

Flames can also be designed to emerge through perforated copper or stainless steel tubing bent into various shapes, a technique often used to create walls of flame that are thin in depth from front to back, but potentially extremely wide and tall – or contoured in some specific way. In smaller applications, this technique can be used to create figures within fireplaces or fire rings that can represent a drawing or pattern of some kind, such as a company logo.

Flame can be channeled and manipulated to take on a directed (even literal) shape, such as a fish tail or a single, thin,

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Photos top left, top right and middle right courtesy Automated Fire & Water Effects



Modern technology and imaginative artists are taking flame effects to all new levels of visual appeal, using fire as a sculptural material in the same way watershapers have elevated the special effects they achieve with water. Recently, I've taken things a step farther by combining the two materials with startling intimacy, introducing a flammable material to a water stream to create incendiary arches.



upward-pointing stream. It can also be shot under high pressure to create fireballs or made to swirl like a tornado. In systems I'm currently developing, flame is mixed with water in pressurized nozzles to create arching, fully integrated fire/water mixes.

I've seen flames sprayed against upward-facing surfaces or licking along banked structures. I've also seen it choreographed and sequenced by electronic control systems in animations reminiscent of dancing fountains. In subtler (but incredibly sophisticated) applications, I've seen materials used to create the effects of low-burning embers that gently dance to illuminate surrounding spaces and materials.

It is indeed a field where the skies – and our imaginations – are truly the limit.

Safety Standards

Regardless of technical sophistication, all fire applications have some very basic issues in common, many of them centered on safety. Those issues can be broken into two distinct categories: First, you don't

want anyone to be hurt by coming in overly close contact with your fire effect and, second, you don't want your controlled flame to start another uncontrolled fire.

This means, basically, that you must control the movement of people and the behavior of the fire itself. Many of these characteristics are dictated by local building codes or by the National Fire Protection Association, specifically NFPA 160 ("Standard for the Flame Effects Before an Audience").

On a commonsense basis, you want the space organized so that people must intentionally move across some obvious barrier to come in contact with the flames in order to get burned. Also, you have to consider the proximity of fire to materials that might serve as a fuel source. Trees and other plant materials or wooden structures overhanging fire sources are a *very* bad idea.

Environmental influences on the flame effect should also be taken into account. Rain and the expansion of freezing water, for example, can damage crucial com-

ponents, while falling leaves can accumulate in an inactive flame effect and lead to an unwanted fire once the flames are turned back on.

In addition, structures that contain fire must be able to do so safely. That may seem obvious, but there are some types of stone materials – perhaps most notably river rock – that can explode into shards when exposed to fire. Glass that's used with fire must be specifically designed to accept extreme temperatures (as does Pyrex) for much the same reason.

Wind is a big safety issue with fire as well. This has to do with the fact that a prolonged gust can blow out a flame, in which case the fuel can continue to emerge and become concentrated enough in an area around the burners to become a perfectly flammable blend of fuel and oxygen. If a spark of some type is inadvertently supplied to that fuel, it can create a fireball or column of flame that will burn those nearby or start an uncontrolled fire.



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Almost all control systems for flame effects include flame sensors that will determine when the flame has extinguished and will then automatically close valves to stop gas emission. More sophisticated systems include anemometers or other sensors that automatically lower or completely shut off flames when the wind velocity or other predetermined safety issues arise – such as a person standing too close to the flames.

This brings up a key consideration regarding the fuel used in these systems: The vast majority of decorative flames use propane or natural gas, the latter being by far more common. Natural gas is the slightly safer of the two because it is lighter than air and will dissipate with relative ease.

By contrast, propane is heavier than air and will sink to the lowest level when released from its source. If a propane burner is blown out by wind or some other leak occurs, unintended ignition of the gas can be catastrophic – as in cases where the gas fills up a nearby basement or equipment

vault and explodes violently when hit by a spark of any kind. (See the sidebar on page 45 for more on propane concerns.

On more familiar ground, the output of any fire system is measured in Btus (British Thermal Units), just as with heaters, furnaces or ovens. Proper line sizing relative to the Btu output is absolutely critical for effective and safe operation, with the distance between the “appliance” and the gas meter being a crucial factor, just as with pool heaters.

The creation of fire also generates gas byproducts that must be taken into account, including carbon monoxide and carbon dioxide, both of which can mass into deadly concentrations near a flame effect. The combustion process itself can also deplete the area next to the flame effect of much of its oxygen, which makes it important to ensure adequate ventilation.

In this and a range of other matters, component or system manufacturer recommendations should always be fol-

lowed without exception.

It's Alive

When I consider fire as an artistic medium as well as a technical challenge, I find it quite useful to think of it as a living thing.

That may seem absurd, but think about it: Fire is “born” when oxygen, fuel and spark come together. It consumes “food” in the form of flammable fuels and will “grow” the more fuel and oxygen are added. It can “reproduce” by starting other fires and will “die” when robbed of fuel and/or oxygen. In a design sense, fire must be carefully conceived, fed, nurtured and tamed, as is the case with many species of animals and plants we use to our benefit.

When used properly in a landscape, watershape or interior setting, there are few things that will provide more interest, intrigue, mystery, romance or excitement than fire. For those who wield it creatively and sensibly, fire effects may indeed be the ultimate “turn on.”

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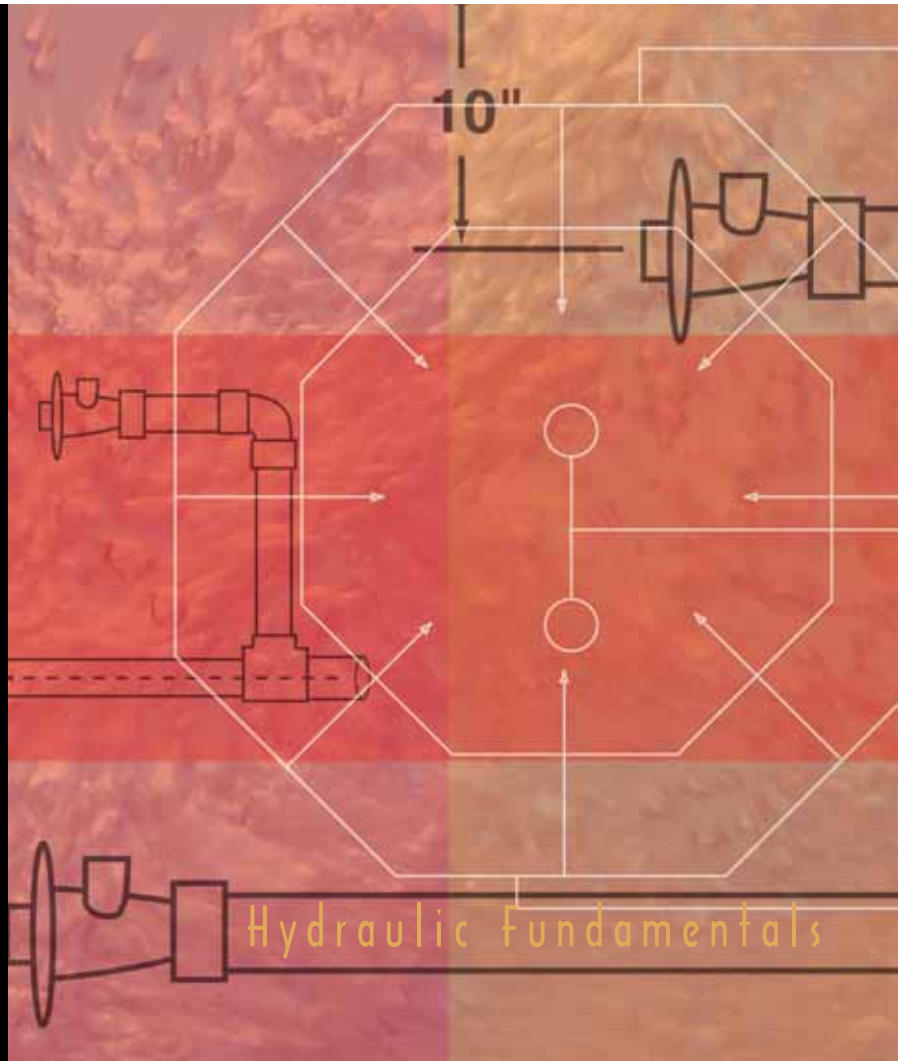
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Balanced Force

By Steve Gutai

The relationships among plumbing size, water flow, pressure and head are fundamental to the science of hydraulic design, notes Steve Gutai, our resident hydraulics expert. Although the mathematics defining those relationships can be complex, he stresses the fact that the basic concepts driving the science are something that anyone charged with designing complex systems should understand and apply with each and every project.



Working successfully with hydraulic systems requires two things: Understanding the definitions of the basic factors involved in hydraulic calculations and seeing how those values relate to and influence each other in the real world.

The last installment in this series of articles focused on the relationship between *flow* and *velocity* with respect to water. The related concept we'll explore this time takes our understanding of that key relationship a step farther by exploring a specific pair of additional relations summarized by two statements: Given a constant flow rate,

- the *smaller* the flow section of a pipe, the *faster* the velocity of the water
- the *larger* the flow section of the pipe, the *slower* the velocity of the water.

If we grasp the full meaning of those two, related concepts, we take the first step toward understanding basic fluid mechanics as it pertains to hydraulic design for custom watershapes. The last article approached this subject by examining the

continuity equation. This time, we'll be taking a close look at the concepts of (and relationship between) *pressure* and *head*.

What we'll consider here is pressure in all of its forms (including vacuum) and the four measurable types of head. This will take us to Bernoulli's equation, a complex mathematic construct that explains these fundamental aspects of hydraulic science.

DIGGING IN

The above is certainly a huge conceptual bite and the specific mathematics can be challenging to absorb. But there's a reward at the end: Putting all of these concepts in order and understanding the relevance of Bernoulli's equation is the key to seeing just why it is that faster water velocity means lower pressure and slower water velocity means higher pressure.

If we approach these important concepts systematically and figure out the relationships, we're in a much better position to understand the systems we're

designing and installing. Let's begin by defining some basic units used to measure pressure and head in all of their forms.

A *cubic foot* of water is a fundamental unit used to define the basic properties of *pressure* and *head* and can be looked at in several different ways. For starters, a cubic foot of water is equal to 7.48 gallons and weighs 62.3 pounds at sea level. This cubic foot can also be segmented into 1,728 cubic inches or viewed as 144 water columns, each of them a foot tall with a one-square inch surface area (Figure 1).

These 144 water columns are used to define *feet of head*, that is, a one-foot-tall water column with a one-square-inch surface area is equal to *one foot of head*. If this one-foot-tall, one-inch-square water column were put on a scale at sea level, it would weigh .433 pounds. This tells us that this one-foot water column or *one foot of head* is equal to .433 *pounds per square inch (psi)*. If we took this same one-foot water column and stretched it

Figure 1: The 144 one-inch-square water columns in a cubic foot of water are used to define feet of head. At sea level, one of these units weighs .433 pounds.

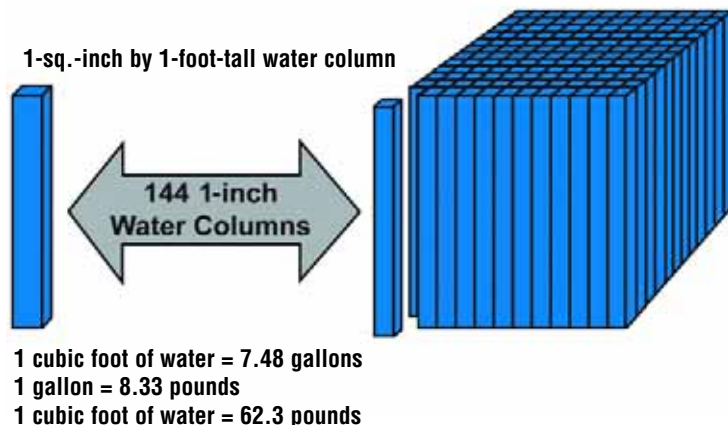
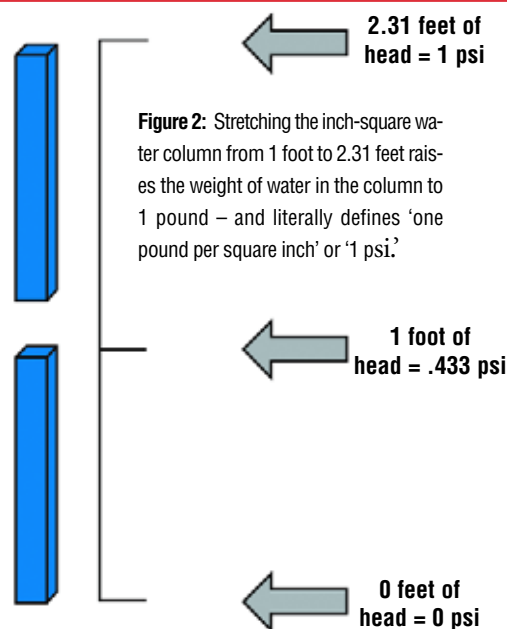


Figure 2: Stretching the inch-square water column from 1 foot to 2.31 feet raises the weight of water in the column to 1 pound – and literally defines ‘one pound per square inch’ or ‘1 psi.’



out to be 2.31 feet tall, it would have a weight of one pound or *one psi* (Figure 2).

This conversion – that is, one foot of head equals .433 psi and one psi equals 2.31 feet of head – is very important: We will use this information to convert back and forth freely from head to pressure (a trick that will be used very heavily in future articles).

For its part, *pressure* can be defined as a force that is perpendicular to the area of a surface. The usual place to read pressure on a swimming pool/spa system is at the filter, where the force projected by the water against the internal walls of the filter tank creates pressure that can be read using a pressure gauge (Figure 3).

This type of pressure is called *gauged pressure*. In the pool/spa industry, we frequently refer to this gauged pressure and that’s about it, but this is not the only type of pressure we need to understand in designing custom swimming pools, spas and waterfeatures.

Figure 4 shows the relationships among four types of pressure. *Atmospheric pressure* is 14.7 psi and is the starting point for *gauged pressure*. When placed below gauged pressure on a chart like this, atmospheric pressure is also called *barometric pressure*. When you put them together, gauged pressure plus atmospheric (or barometric pressure) equals *absolute pressure*.

An absolute pressure equal to zero generates a condition known to scientists as a *perfect vacuum* and can be achieved only beyond Earth’s atmosphere in the vastness of space. A vacuum exists below atmospheric pressure and is normally measured in *inches of Mercury (Hg)* or *negative gauge pressure*.

Figure 3: In a common filter tank, pressure is the perpendicular force of water pushing on the tank’s interior – a pressure that can be read using the tank’s pressure gauge. Pressure gauges read the difference between ‘internal psi absolute’ and ‘external psi atmospheric’ – which in turn equals ‘psi gauged.’

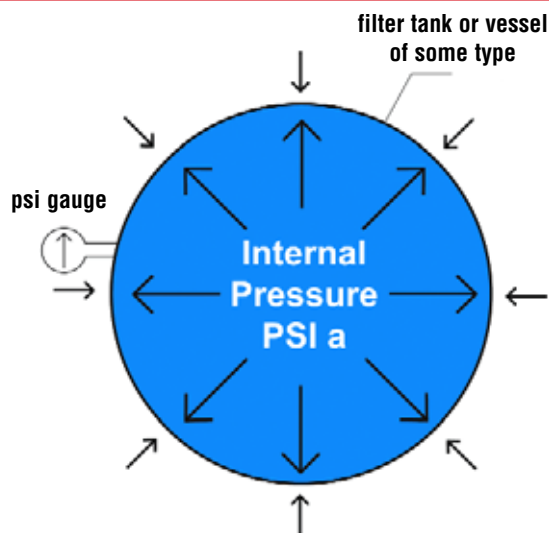
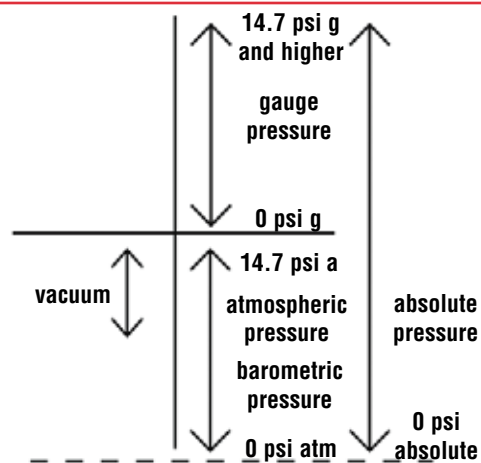


Figure 4: The relationships between the forms of pressure are seen in this chart. Vacuum is considered ‘negative pressure’ (that is, pressure below atmospheric pressure) and is expressed in terms of inches of mercury (Hg) or by water-column feet (that is, feet of head).



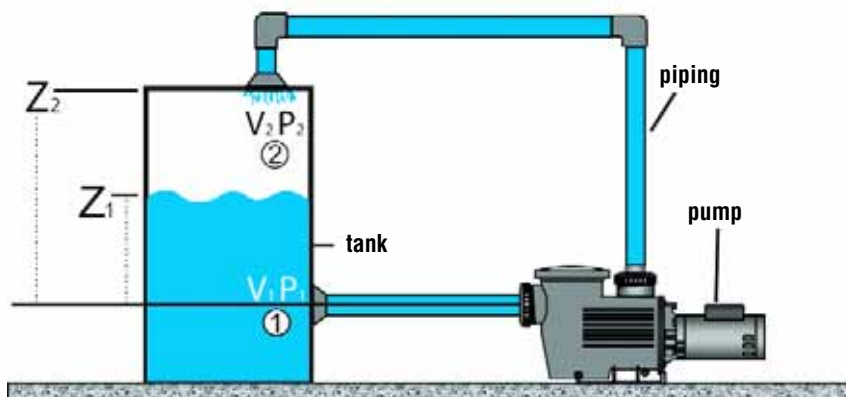
A perfect vacuum checks in at 30 inches of Mercury, 33.9 feet of head or -14.7 psi as gauged pressure (again, see Figure 4). Vacuum can be converted to feet of head by using a multiplier of 1.13 – another useful conversion factor.

HEAD EXAMINED

In designing a hydraulic system, the first step involved in selecting the proper pump is understanding the amount of energy or head required to move water to serve specific applications, whether it's about moving water to a spa-jet manifold, a vanishing-edge weir or any of a number of other pool, spa or waterfeature effects.

To work in this arena, we need to pull apart the terms *head* and *feet of head* and define four common terms from fluid mechanics: velocity head, pressure head, elevation head and head loss. The first three are about energy, while the fourth is used to describe friction loss and the consequential pressure drop that occurs in piping networks.

Figure 5: Differences in elevation create pressure in hydraulic systems. Balancing the flow within these systems is about working with and balancing elevation, velocity and pressure head – and vividly defines the need for proper pipe and pump sizing.



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Lets look at the first three terms and some fundamental hydraulic/mathematic nomenclature.

► **Elevation head.** This is the *potential energy* that occurs in the water as a result of its elevation above some given point, with this difference in elevation being useful in solving basic problems in fluid mechanics. The head or energy is converted to work, for example, if the force of gravity moves the water across a vertical distance to some lower level.

In a system that has a pump, the two elevation points might be the pump's centerline and the water's surface. If the system is gravity-fed, however, the two points could be two vessels at different elevations that are connected by a gravity-feed line of some type. The force created by gravity is what moves water in these systems.

The difference between the two elevations is the key, and the term *delta Z* (or ΔZ) is commonly used to describe $Z_1 - Z_2$, that is, the difference in eleva-

tions (Figure 5). Custom swimming pools often have gravity-feed systems in their hydraulic designs. Vanishing-edge pools, for example, require backflow-prevention devices because of potential siphoning effects that occur as a result of elevation head.

► **Velocity head.** This is the *kinetic energy* that occurs in the water as a result of its velocity. The faster the water travels or the higher its velocity, the greater the kinetic energy or velocity head, which is commonly expressed using the equation $v^2/2g$ (where v is velocity and g is gravity). As we learned in the last article, high velocities occur when the pipe's flow section or size decreases – the foundation for our discussion of the continuity equation.

Applications in which high velocity is important would include spa jets or fountain nozzles – anything in which nozzle or outlet size decreases as the water flows toward the point of discharge. The velocity is at its peak just before the dis-

charge point. This velocity head is expressed in feet per second squared over 2 gravities (with each gravity being 32.2 feet per second).

► **Pressure head.** This is the *pressure energy* that represents the amount of work needed to move the water within a pipe or conduit (again, see Figure 5). Pressure head is required to overcome a pressure or vacuum in a piping network located up or downstream of a pump. Water always moves from a region of high pressure to low pressure if the pipe size or flow section remains constant, a phenomenon commonly stated in pounds per square inch as $p144/62.3$.

As mentioned earlier in this article, psi or pounds per square inch is equal to 144 divided by the specific weight of water, which is 62.3 pounds per cubic foot. A one-foot water column with one square inch of surface area translates to .433 pounds. To convert psi to feet of head, we multiply psi by 2.31.

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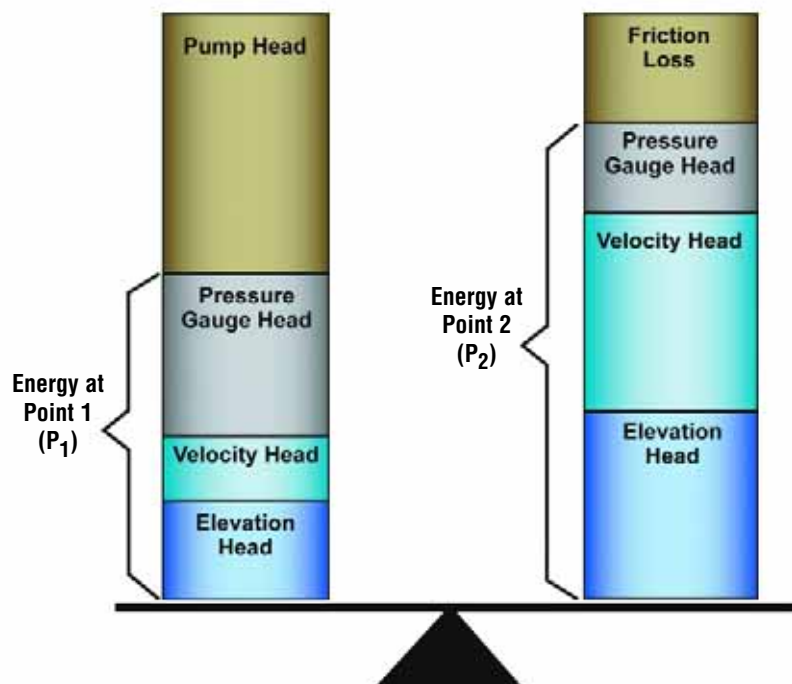
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Figure 6: Hydraulic-system design is all about balance and making certain that the pump you've selected will adequately overcome frictional losses and keep the other pressure factors in alignment



ship helps us in sizing components based on pressure and head in addition to flow – a key to proper specification of systems including spa jets, fountains and in-floor cleanings systems – just a few of the watershape systems that have both pressure and flow requirements.

Wrapping up this set of definitions, we come to *head loss*, which is the friction loss or pressure drop that accumulates in the piping network as a result of pipe lengths, fittings, valves and water's passage through assorted components. (This topic will be discussed in detail in the next article, where we'll cover both the coefficient of friction and the Darcy equation.)

DOING THE MATH

Now we come at last to *Bernoulli's equation*, the mathematical construct used to explain a concept known as *conservation of energy*.

Basic physics tells us that energy can neither be created nor destroyed in a

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closed-loop system. It can only be transformed from one form to another. Bernoulli gave us a way of understanding the shift from one form of head to another – and offers us a key to understanding the constant shifts from velocity head to pressure head we are now ready to observe and accommodate in our piping networks.

In essence, Bernoulli's equation gives us a way of understanding the shift from one form of head to another as a result of conservation of energy. Simply put, the equation states that the total energy at any point is equal to the sum of the elevation head, the velocity head and the pressure head. If the system has no energy added to it and there are no friction losses, then the equation is $Z + 144P/P + v^2/2g = H$.

The reality, however, is that systems have increases in energy because of the use of pumps and friction losses because of piping and fittings. To accommodate those factors, the equation is rewritten as

$Z_1 + 144 P_1/P_1 + v_1^2/2g = Z_2 + 144 P_2/P_2 + v_2^2/2g + h_L$. The changes reflect the difference as the water moves from point one to point two. When the formula shows these two points, the energy balance can be observed (Figure 6).

Don't despair: You'll probably never, ever be called on to plug values into this equation and actually come up with an answer. What you should understand is this: Bernoulli's equation helps explain the shift in energy that occurs in a piping system that has water pumped into it and underscores the fact that there's always a need for balance. That is, if the velocity of the water increases, then there will be a reduction in pressure; if there's an increase in elevation, there will be a reduction in pressure or velocity.

In other words, the sum total of the pressure head, velocity head and elevation head will never change, but the proportions among them will. When we add a pump, its head (or energy) is

equal to the difference in elevation, the difference in pressure head, the difference in velocity head and the frictional losses attributable to the piping, fittings and components.

You may never need to do the math, but what you should know is that the systems you're developing are subject to some heavy-duty rules that govern their performance. If you lack the expertise or experience needed to put everything together on your own, good system performance will only be assured if you know where to go to get answers – and then put the advice to good and purposeful use.

We're still just part of the way into this examination of all you need to know to design effective, efficient hydraulic systems for a custom swimming pool, spa or waterfeature. A real understanding of all the factors influencing what you do extends beyond flow, head and pressure to include pressure drops – the subject of the next article in this series.

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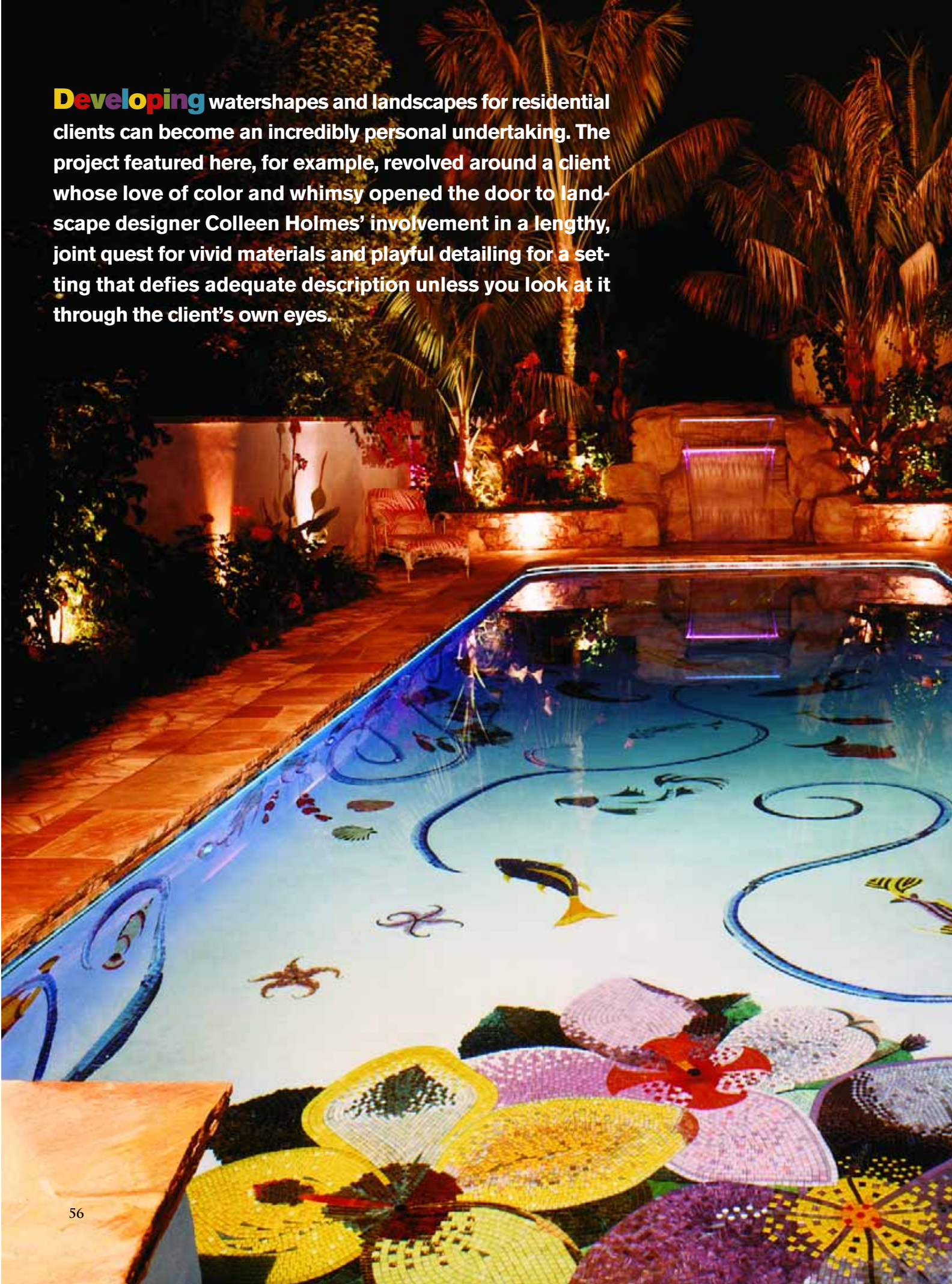
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Developing watershapes and landscapes for residential clients can become an incredibly personal undertaking. The project featured here, for example, revolved around a client whose love of color and whimsy opened the door to landscape designer Colleen Holmes' involvement in a lengthy, joint quest for vivid materials and playful detailing for a setting that defies adequate description unless you look at it through the client's own eyes.





SERIOUS

WHIMSY

By Colleen Holmes

This project was all about fun and finding ways to infuse watershapes and the overall landscape with childlike senses of playfulness and wonder.

At a glance, of course, it's obvious that this *particular* approach wouldn't work for too many clients, but in this case, we were working with a woman who wanted her yard to express her love of color, her sense of humor and her unparalleled inclination toward the unusual.

From our first meeting, I knew that this was someone who wouldn't settle for anything that even approached the ordinary. Maybe it was the 12-foot-tall fiberglass chicken she'd placed in her front yard or the life-size hippopotamus in the backyard or her wildly eclectic taste in art and interior furnishings or her fittingly off-beat personality.

Whatever it was, from the outset I had the feeling that this job would go in a direction all its own and would almost certainly be among the most unusual projects I'll ever tackle no matter how much longer I stay in the business. She was just like a kid in a candy store, mostly interested in anything that would make her laugh or surprise her steady flow of guests. From day one, it was obvious she wanted something that no one else would *ever* have.

For more than three years, I worked side by side with this terrific client, making suggestions, expanding ideas and listening carefully to the way she talked about her world – all the while looking for ways to incorporate the wildest possible colors and materials into a design that would, in its own way, make perfect sense – or perhaps perfect *nonsense*?

Photos by Kathleen Persoff, Studio City, Calif.

GOOD LAUGHS

To my mind, the most important thing watershape and landscape designers do is communicate. Every client has a different personality and set of priorities and ideas, and it's up to us to draw out their desires and apply our talent to the process of refining, expressing and creating a result that reflects their desires. That's why I see every project as different, because every client is different.

These communication processes can be difficult to navigate, and in this situation, riding with the give and take was utterly crucial. There were things the client wanted that I tried to alter, nudge and transform, for instance, and we engaged in many lengthy discussions before coming to agreement on each and every detail. The result, I think, is an expression of the client's ideas paired with my ability to make it work in the given setting.

It bears mentioning that all of the explosive color and whimsical innovation she wanted required a huge amount of hard work and research on my part. The pool alone, for instance, features more than 100 types of carefully selected glass tile, each carefully matched to its intended use. (It might go without saying at this point that we went through *several* conceptual designs as I successively accommodated her desire for whimsy.)

The setting for this effort was a large rectilinear backyard in the verdant flats of North Hollywood, Calif. The accompanying house is shaped like a barn and has been festooned with antiques, artworks and architectural touches. The kitchen, for example, has a tile creation mosaic that took a local artist nearly five years to complete. When I arrived, the only part of the



The backyard is filled with unusual details, all aligned with the client's unique spirit. From the artificial palm nestled up against the classic fountain to the vividly colorful patio furniture, from the sensational decking material and equally fantastic wall fountain to the glowing fireplace and welcoming hippopotamus, everything bespeaks an individual with an unabridged sense of exactly what she wants in her surroundings.





composition that didn't fit was the backyard – decidedly drab and lacking in personality.

All I had to start with was the existing swimming pool (a functional but unadorned rectangle) along with the aforementioned hippo. Beyond that, we were to strip the backyard back to bare canvas and revamp the space with a renovated pool, stone decking, eclectic plantings, an outdoor kitchen/dining area, lighting treatments, sculptures and a range of small waterfeatures.

That's a lot to accommodate, especially with a client who wanted to see several versions of the overall concept. In the ensuing months, in fact, I offered at least five completely different versions of the design for review, each one of which went through multiple revisions that reflected the fact that things changed virtually every time we spoke.

Eventually, however, she settled on a concept that excited her and enabled us to proceed to get bids. But frankly, the design was so unusual and sublimely silly that it was basically impossible to get precise estimates even from our select team of subcontractors.

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☐ **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)
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☐ **January/February 2001** (Vol. 3, No. 1)
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☐ **March 2001** (Vol. 3, No. 2)
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☐ **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)
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☐ **September 2001** (Vol. 3, No. 7)
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☐ **October 2001** (Vol. 3, No. 8)
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☐ **November 2004** (Vol. 6, No. 11)
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☐ **December 2004** (Vol. 6, No. 12)
Revisiting 25 projects that define **The Platinum Standard** in watershaping.

Note: The listings here represent partial contents of the available issues. In addition, all 2005 and 2006 issues are available!

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Among many amazing qualities of the backyard is the way entirely different moods are encompassed within a single space. On the one hand is a wonderful beach-scene mural set under a colorful awning right next to an enormous Coca-Cola display case, while on the other is a weeping wall dedicated to the memory of the client's son. As a designer, I was emboldened at every turn by her willingness to explore all of these forms and possibilities.

Soon after we secured the construction contract, however, she decided she wanted to rework the design yet again, adding an outdoor fireplace and a couple of new waterfeatures. It was a never-ending process, but it was one that held few surprises for us after our experience in the design phase.

One of the first things we did after contracts were signed was go shopping for stone – not locally, but at a stoneyard located 200 miles to the south, near California's border with Mexico. At first, she was drawn to a very expensive (but surprisingly conservative) limestone decking, the sort of stone we see all the time on high-end projects.

In this case, all I had to do was look at her and say, "Are you kidding? This isn't you!" to get her to turn her attention to a beautifully expressive combination of rose quartz and what I call "candy stripe," a type of limestone richly striated with reds, pinks and creams.

She quickly fell in love with this base

color palette, which we later augmented with materials in just about every color in the rainbow. Before we were through, we'd rounded out the palette with a blizzard of brightly colored glass tile and stone fragments, an Art Deco-style mural, fiber-optic lighting, specimen stone, flag and ledger treatments, colorful fabrics (courtesy of the umbrellas, awnings and patio furniture) and amazing hothouse plantings.

One of the reasons we ended up with five waterfeatures in all was the fact that she'd keep running into new materials that she absolutely loved, leaving me with the need to incorporate them somehow. (Three out of the five were developed well into the construction process.) That same "gotta have it" principle applied to detailing for the outdoor kitchen, the plantings and placement of such disparate items as a giant Coca-Cola machine, artificial palm trees lit internally with fiberoptics and an array of dangling "firefly" lights.

Late in the process, we even found a



new home for the hippo courtesy of a bed of colorful riparian plantings. The portly fellow had already been moved several times by now, and at one point his concrete “riverbed” had already been poured and its river-blue glass tiles already purchased. Ultimately, however, it was decided to move him to a new space and let him serve as an unofficial greeter for guests emerging from the house to enter the garden for the first time.

CENTER STAGE

As we learned early on, this was not the first time the client had tackled the backyard.

Previous work had focused on a large tiki hut and a pool that had been finished in a pebble surface punctuated by disconnected glass-tile mosaics of fish and pathetic-looking seaweed. Both outcomes were dreadful: The hut was massive and extremely dark inside, and the mosaics just didn't assert themselves to her liking.

It was certain she'd be satisfied to discard those elements and start over.

Our first thought with the pool was to re-plaster the surface, keeping the fish (maybe adding a few more) and redoing the tile line. As we got into the demolition, however, a number of the fish mosaics were damaged—a possibility to which she'd been alerted before we started. It wasn't long before we agreed to strip the pool completely, leaving only the shell intact as the foundation for an all-new finish.

At first we focused on the tile line, for which a random geometric pattern had been designed using a range of colorful one-by-one glass tiles. Then we started thinking about fish again and agreed that we needed several additional underwater elements to make the whole thing hang together. For a while, we talked about an all-glass-mosaic finish.

Even though she was seldom concerned about costs, I found that the all-tile option pushed her out of her comfort zone. As

an alternative, I suggested a softly colored Hydrazzo finish to set off mosaic elements that would be woven throughout the pool. Before long, we'd settled on doing the deep-end wall of the pool in an all-tile rendition of an underwater kelp-bed scene and adorning a shallow, semi-circular ledge on the opposite end with a vivid mosaic depiction of hibiscus blossoms.

Developed in collaboration with scores of suppliers, the deep-end mosaics include dozens of fish and sea creatures, underwater rocks and a series of swirling contours suggesting the subsurface flow of a powerful current. It also includes beams of yellow sunlight penetrating the surface, a detail inspired by my own experiences while scuba diving in the clear waters off nearby Catalina Island.

This extreme variety was once again the result of the client's impulsive nature: Every time she'd see a new type of tile, she'd fall in love and we'd end up figuring out how to make it work. Often, she'd



Tile from dozens of suppliers has been arrayed in the pool's elaborate depths. From the kelp beds on one end to the hibiscus blooms on the other, the level of detail, the depth of the colors and the sheer joy of the composition all shine through. Again, it's a one-of-a-kind installation for a distinctly one-of-a-kind client, and the outcome is simply dazzling in a disarmingly playful sort of way.



IN THE POOL

With all of the contours of the mosaics that had to interface with the Hydrazzo, the finish work inside the pool shell became quite tricky in some places, especially in areas feathered into the deep end's complicated mosaics.

I must give credit where it's due to the tile installer as well as to the plastering team, which did an absolutely amazing job of installing the polished exposed-aggregate finish in and around all that glass tile.

Above the tile line is a thin ledger-stone detail that cantilevers slightly over the edge. This detail arose because we couldn't obtain stone to match the deck that was thick enough to work as coping – an unusual consequence of the quarry's having been closed because of some sort of environmental concern.

It looked as though we had a real problem until I suggested using a much thinner flagstone to create an unusual stacked effect at the water's edge. In this case, necessity led to a solution in perfect keeping with the unique spirit of the entire project.

– C.H.

just order things on the Internet, have them shipped to our fabricator and then we'd go take a look at what she'd bought. Frequently, we ended up having to augment her purchases with other tiles of complementary colors so that we could make everything hang together visually.

I wouldn't suggest developing a mosaic program in this way, and there's no doubt that such an approach would fail in most circumstances. But in this case, placed against all of the other vivid colors and materials in the rest of the project, the more we embellished the mosaics, the better it all seemed to work.

TILES, FOUNTAINS AND TRESCOS

As mentioned above, the impetus for the multiple waterfeatures and many of the other elements came directly from the

client's desire to continually expand the range of materials we were applying.

The fireplace, for example, makes use of a captivating rose quartz paired with purple/lavender quartz and translucent Utah Ice stone, now illuminated from within by the dancing fire and the rays of light at sunset. When coupled with the surrealistic nighttime surroundings, the whole structure becomes luminous – and I've never seen anything quite like it.

Adjacent to the deep end of the pool is a large grotto/waterfall structure. Although it's made of a faux stone, we gave no thought to making it mimic a natural waterfall, instead giving it a deliberately architectural/sculptural look. The key twist with this feature involved the use of dual-level weirs with hot-pink and lavender fiberoptics: The upper weir cantilevers over the lower one, creating nested layers of sheeting water – another unusual effect befitting a whimsical setting.

Opposite the grotto/waterfall on the far end of the yard, we built a weeping "ice fountain" so named because it's made with a white, crystalline material known as Utah Ice. (As the project moved forward, tragedy beyond belief struck and the client's grown son passed away in an accident; so she wanted the fountain to be built and dedicated to him.)

Appropriately, water emerges from spaces between the dramatic crystals and gives a literal appearance of crying. We finished its basin with an elegant, translucent, multi-colored glass tile and embedded small, pink-granite hearts in the stonework. Amazingly, despite its solemn dedication and appearance, a wonderful sense of whimsy, love and beauty comes shining through even here.

The registry of dramatic touches goes on and on: There's the courtyard fountain made of pieces of wildly colored foundry-slag glass, a wishing-well fountain, the antique benches and the pieces of wrought-iron fence salvaged from the home of legendary entertainer Liberace. There's also a tile-and-granite-finished outdoor kitchen area; a planting plan so diverse that the lists of bamboos and bromeliads alone beggar description; and a stunning mural painted in plaster on one of the walls of the house to set off part of the patio area.

That mural depicts a partially clad

woman enjoying a pink martini in a hand with pink fingernails, her toes adorned with jewels. The woman lounges at the beach with a number of colorful cabanas and an array of beachgoers in the background. The sky at the top is emblazoned with constellations of stars articulated by hundreds of twinkling fiberoptic lights.

NOT TOO MUCH

The plain truth is that telling the full story of this job almost certainly would require many more pages than what you see here. In some sense, it would be best if you all could come over and see the setting for yourselves: It's the only real way I know to understand and experience the space.

Way back when we started, I had this overarching notion that the entire composition would reflect the mood and feeling one has at that magic hour of twilight, when the world begins to glow with rich, warm pinks, reds and oranges turning to soft blues and eventually fading to indigo. Although our color palette ultimately expanded to encompass most points on the color wheel, we managed to hold onto that original vision and have, I think, captured the remarkable transitions that take place in the soft light of early evening.

What we've ended up with is hard to define in stylistic terms, but the overall effect encompasses the level of playfulness augmented by the client's unique sense of romance. To a degree, the whole setting flows from a very adult sensibility – albeit one vested with almost an excess of personality.

Through the years, my client and I have become close friends, a bond that kept us on the same page through some trials and tribulations and enabled us at times to stand back and laugh together in the delight that comes from accomplishing something genuine and unique. The project tested my limits, but I must say that it now seems very strange to move along with projects of a more conventional type, if only because I miss the fun and camaraderie I experienced in this unforgettable backyard.

Every time I come back to this project even in thought, I find myself filling up with a special sense of creative freedom, love and silliness. All of it amounts to an experience I know I'll never forget.

SURFACING SYSTEM

Circle 135 on Reader Service Card



CENTURYSTONE CONCRETE PRODUCTS offers a surfacing system that can be used indoors or outdoors on both flat and vertical surfaces. When applied as a 1/8- to 1/4-inch coating over an existing surface, the product can be stamped with a wide variety of patterns to mimic stone, tile or brick while saving the cost of removing and replacing otherwise stable substrates. **CenturyStone Concrete Products**, Mesa, AZ.

COMPACT TRACK LOADERS

Circle 136 on Reader Service Card

BOBCAT offers the T140, a track loader that is compact enough to work in small spaces yet powerful enough to handle big jobs. The loader is just 56 inches wide and has an operating capacity of 1,400 pounds. The tracks feature a design that provides an ideal balance between flotation and traction, and the cab is designed for safety, comfort, visibility, easy operation and the monitoring of 14 key functions. **Bobcat**, West Fargo, ND.



INTERACTIVE WATERFEATURE CONTROLLER

Circle 137 on Reader Service Card



CRYSTAL FOUNTAINS has introduced the ChoreoSwitch, an all-in-one package that offers an easy, cost-effective way to create interactive water features and dry-deck displays. Using some of the company's most popular programming sequences, the system brings jumping, popping and chasing effects (complete with light and music) to parks, shopping malls, theme parks and residences. **Crystal Fountains**, Toronto, Ontario, Canada.

TRENCH GRATES

Circle 138 on Reader Service Card

IRONSMITH offers a line of pedestrian-proof trench grates in a wide array of styles, materials and finishes. Available in cast iron, aluminum or bronze, the grates come in 4-, 6-, 8- and 12-inch widths and can be ordered in any desired custom width. They come in nine different patterns, are available in any specified radius and come complete with preformed steel troughs for straight sections. **Ironsmith**, Palm Desert, CA.



LINERS AND COVERS

Circle 139 on Reader Service Card



IN-LINE PLASTICS offers geosynthetic membranes for all applications: aquaculture, decorative ponds, golf-course waterfeatures, streams, recreational ponds and more. Made with premium HDPE, polypropylene, PVC and LLDPE resins,

the membranes are available with thicknesses from 6 to 100 mils and offer excellent resistance to chemicals, UV light, punctures, tearing and cracking. **In-Line Plastics**, Houston, TX.

HIGH-PERFORMANCE PUMP

Circle 140 on Reader Service Card

PENTAIR WATER POOL & SPA has introduced the IntelliFlo 4 x 160 pump. The device features variable-speed technology that saves energy and money while lengthening pump life. The pump can be programmed at up to four distinct speeds – for example, one speed for the filtration cycle, another for spa operation, another for a waterfeature and a fourth for any other pump function. **Pentair Water Pool & Spa**, Sanford, NC.



ARTIFICIAL-WOOD PLANKS

Circle 141 on Reader Service Card



TIMBERTECH has introduced Earthwood Planks that replicate the look of costly tropical hardwoods for use in deck-planking applications. Made from a patented formulation of pure plastic resins and high-quality wood flour, the planks have

no knots, splinters or curves and will not warp or experience insect damage. Each plank cuts, drills and fastens like wood, but no sealing is required. **TimberTech**, Wilmington, OH.

WATERFALL WELL

Circle 142 on Reader Service Card

SAVIO ENGINEERING offers the Pond Free Waterfall Well, an enclosure that protects hidden pump components from the crushing forces of rock and water. Designed for vanishing-waterfall and endless-stream applications where there's no standing water and no pond to maintain, the units are made of a tough, injection-molded material that eliminates the need for a metal grate. **Savio Engineering**, Santa Fe, NM.



CHLORINE GENERATOR

Circle 143 on Reader Service Card



JANDY has introduced PureLink, an integrated system that unites the AquaPure salt chlorine generator with the AquaLink RS controller – a combination that offers easy installation, superior reliability, a flexible user interface and the advantages that come with seamless communication between devices. The system comes in two models: one for pools up to 15,000 gallons, the other for pools up to 40,000 gallons. **Jandy**, Petaluma, CA.

POOL COVER CONCEALER

Circle 144 on Reader Service Card



BBDECK offers a system that conceals retracted pool covers and their mechanisms beneath a rotating deck section. Designed to allow full use of all pool edges while providing complete access to the pool cover for cleaning and maintenance, the sturdy device's top can be finished to blend in with surrounding decking of any type and rotates up to 90 degrees to get completely out of the way. **BBDeck**, Ketchum, ID.

STAMP/STENCIL CD

Circle 145 on Reader Service Card



POOL DESIGN SOFTWARE has added a bonus compact disk featuring 1,000 concrete stamp and stencil textures to its Photo Imaging Program. The imaging software allows the contractor to create a virtual rendering of a client's complete backyard, including a range of swimming pool/spa shapes, waterfalls, landscaping – and now stamped and stenciled concrete patterns. **Pool Design Software**, Jensen Beach, FL.

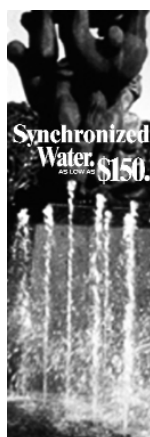
OZONE GENERATORS

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DEL OZONE offers water-treatment systems scaled to the needs of commercial and public aquatic facilities. Designed for vacuum operation and equipped with onboard oxygen concentrators that reduce the cost of operation, the ozone systems reduce chlorine and bromine use by up to 80 percent and provide water that is safer, free of chloramines, cleaner, clearer and easier to manage. **DEL Ozone**, San Luis Obispo, CA.

Continued on page 68



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HYDRAULIC HAMMER

Circle 147 on Reader Service Card



CATERPILLAR offers the H55Ds hydraulic hammer for demolition and site clearing. Designed for high productivity and reliability, the unit features a simplified design that reduces the number of parts by almost half (compared to the previous model) for easier maintenance. The device also features a higher blow rate and 25 percent more power for superior production from the 436-pound tool. **Caterpillar**, Peoria, IL.

FOG EFFECTS

Circle 148 on Reader Service Card

FOGCO SYSTEMS offers misting systems for three types of applications: patio cooling to reduce outdoor temperatures by up to 40 degrees with billions of water droplets; Mistscaping to blanket waterfalls, stone structures and landscaping in a gentle fog; and FogDeck, a system installed during construction to introduce a blanket of fog across the surface of a swimming or reflecting pool. **Fogco Systems**, Chandler, AZ.



CONCRETE PRODUCTS

Circle 149 on Reader Service Card



PAVESTONE offers a complete line of decorative paving stones, edgers, retaining wall units, site furnishings and erosion-control products to aid designers in creating beautiful, affordable, low-maintenance patios, walkways, walls, planters, plazas and driveways. Made from concrete and available in a wide variety of styles and colors, the products are laboratory tested for durability and strength. **Pavestone**, Grapevine, TX.

MODULAR PUBLIC POOLS

Circle 150 on Reader Service Card

RENOSYS offers FuturaPool, a modular public pool for new construction. Features include a one-piece brace assembly; durable, PVC-clad laminated stainless steel wall panels; and fully engineered, fully integrated construction technologies for applications in municipal, competitive and therapeutic pools as well as in zero-depth and wave pools in club, hotel and light-commercial settings. **RenoSys**, Indianapolis, IN.



PAVEMENT SAND

Circle 151 on Reader Service Card

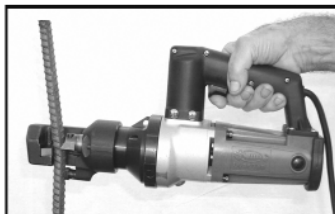
TECHNI-SEAL offers HP Polymeric Sand for pavement joints. The product's sand/binder combination is ideal for pool decks and stays within joints to provide stability and durability for concrete, clay or natural stone pavers. It inhibits weed growth and resists insect infestation and comes in two colors: tan or gray. The product is applied dry and hardens after being sprayed. **Techni-Seal**, Boucherville, Quebec, Canada.



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FAUX-STONE SPA SKIRTS

Circle 152 on Reader Service Card

REPLICATIONS UNLIMITED has introduced three new textures (high, medium and low profile) for its spa skirts, walls and backdrops. Offered in both rigid and flexible versions that are easily wrapped around and fastened or glued to any substrate, the products come in sheets to fit outdoor applications of various sizes and are available in a range of standard and custom colors. **Replications Unlimited**, Hazelwood, MO.



WATER-CHEMISTRY CONTROLLER

Circle 153 on Reader Service Card



ACU-TROL offers the AK110, a micro-processor-based controller designed to monitor and control all chemicals in pool and

spa water in combination with the company's AKColor system for treatment of combined chloramines. The unit measures everything from pH and ORP to chlorine concentration and temperature and feeds chemicals to maintain the water in specified ranges. **Acu-Trol**, Auburn, CA.

INSPECTOR TRAINING CD

Circle 154 on Reader Service Card



NATIONAL SWIMMING POOL FOUNDATION offers a Certified Pool-Spa Inspector (CPI) Training CD to help public and environ-

mental-health officials conduct effective inspections and help pool and spa operators maintain exceptional facilities. The program is patterned on actual inspections and was developed with technical advisers from six key states. **National Swimming Pool Foundation**, Colorado Springs, CO.

WATERFALL ECHO CHAMBERS

Circle 155 on Reader Service Card



ATLANTIC WATER GARDENS has introduced EchoChambers for pondless waterfall features.

Available with 250- and 800-gallon capacities, the units are equipped with a removable grate system that offers easy pump access while using more water and fewer rocks to enhance sound effects. The self-supporting polyethylene receptacles have lifetime warranties. **Atlantic Water Gardens**, Egg Harbor Township, NJ.

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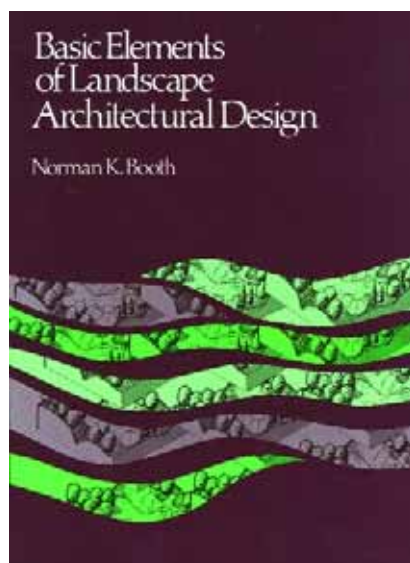
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By Mike Farley

Plans on Design



Watershaping has changed dramatically through the past several years, and we all could probably come up with a hundred different reasons why.

Here's the upshot: Clients are no longer merely asking us to build pools, spas or other bodies of water. Instead, they're asking us to create complete settings that include water. And when you compare where we are now to where we were, say, seven years ago, it's as though *everything* is different.

What the changes mean is that many of us have been or are being forced to seek out more sophisticated approaches to the design process. I recently finished a book that provides amazing insight into exactly that process: *Basic Elements of Landscape Architectural Design* by Norman K. Booth (Waveland Press, 1990).

The book was recommended to me by fellow landscape architect and watershaper Kevin Fleming, and I'm thrilled to have it. Despite the 1990 publication date, the book is used as a college textbook and is still widely available today.

As I was reading this extraordinarily practical, clear, well-organized compendium on landscape architecture, I kept wishing it had been part of my studies back in college. Booth does an amazing job of breaking down the field's varied disciplines into concise, separate but entirely interrelated discussions in seven chapters covering land forms, plant materials, buildings, pavements, site structures, water and, finally, how they all come together in the design process.

I could go on for pages describing his coverage of these subjects, but let's just look at some highlights. The first chapter, for example, discusses landforms and how the various elements of the land and its topography will influence a design's style and details. He offers great examples, discussing the way the flat spaces used for the gardens of Renaissance France resulted in traditions of geometry and hard lines – and then explaining how sloped spaces

inclined 18th-century English garden designers to use softer, curved shapes and complexly layered views.

The fourth and fifth chapters (on pavement and site structures, respectively) offer wonderfully specific information about hardscape structures. He discusses everything from recommended frequencies for expansion joints to the types of hard surfaces and their characteristics. Although the book isn't about construction *per se*, Booth offers useful detail on the proper construction of staircases and walls with a discussion of the desired ratios of treads to risers for steps, for example, or how many steps you should have before inserting a landing and the proper height of handrails.

The sixth chapter – on water – is one of the best treatments I've ever seen coming from the architectural perspective: He explores key issues of reflection, surface area, the sound of moving water and how various types of watershapes will influence the character of a space.

He wraps this all up with a final chapter on the design process and, specifically, how you methodically use all the elements previously discussed to create designs that meet clients' requirements. He also supplies a terrific checklist for site analysis and an equally useful breakdown of the phases of design leading up to a detailed, finished plan.

Perhaps best of all, this is one of the few textbooks for the field that goes into residential designs as well as designs for institutional and commercial properties. Too often, this sort of coverage is omitted from books and college courses alike. At 315 pages, this long book is a feast of variety when it comes to details and technical specifics – the kind of book that becomes a reference you'll consult over and over again.

To me, it's exactly the sort of primer we all need when clients ask us to move beyond the water's edge and create a well-designed exterior environment. **WS**

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

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